CALIFORNIA DEPARTMENT OF
TOXIC SUBSTANCES CONTROL

Department of Toxic Substances Control

Draft Program Environmental Impact Report
for the
Santa Susana Field Laboratory, Ventura County, California

SCH# 2013111068

September 2017

ESA

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CHAPTER 1
Executive Summary

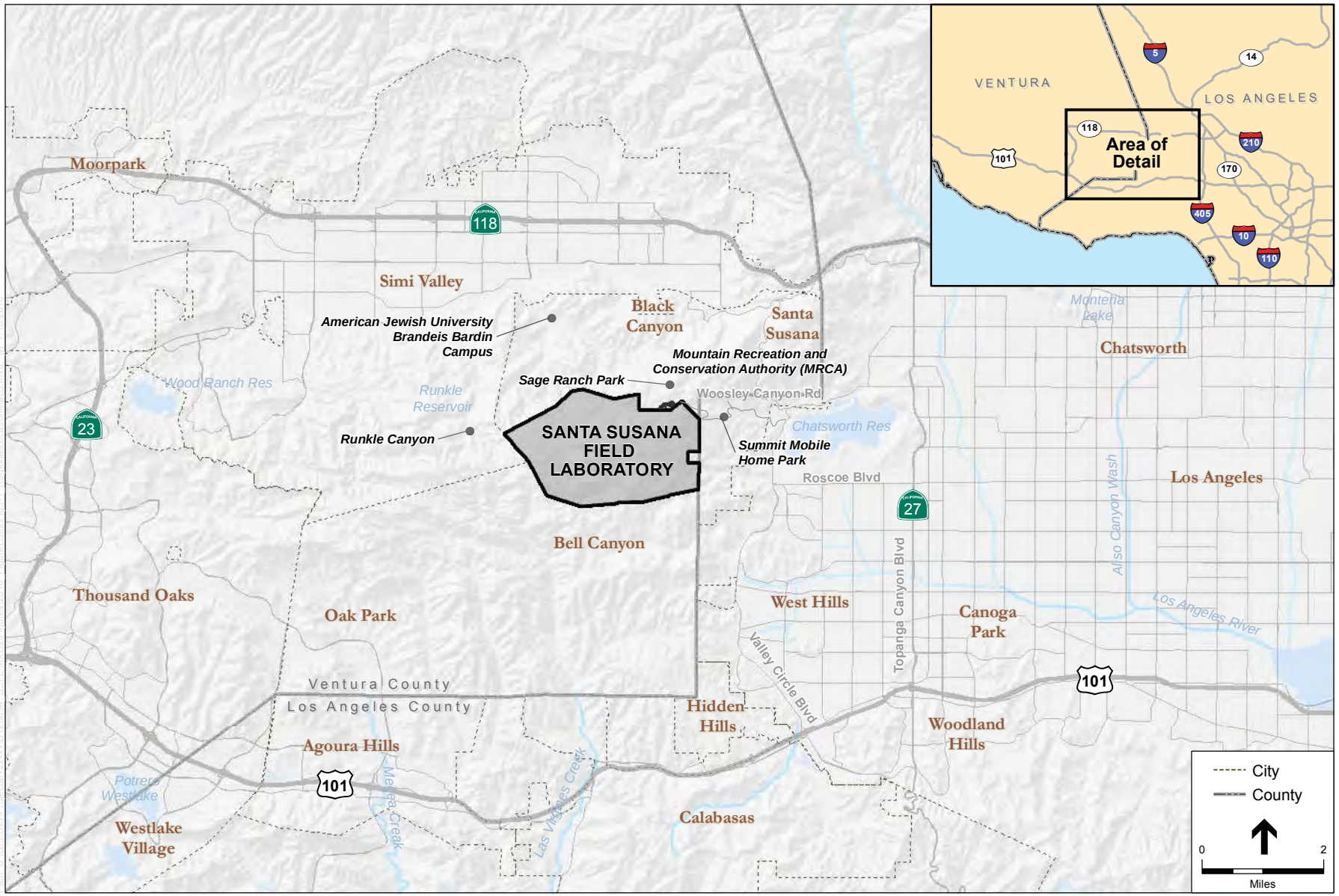
1.1 Introduction

This chapter of the Draft Program Environmental Impact Report (PEIR) has been prepared by the California Department of Toxic Substances Control (DTSC), in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 et seq.; California Code of Regulations, Title 14, Chapter 3, Section 15000 et seq. [CEQA Guidelines]), to evaluate the environmental impacts and to identify and minimize, to the extent feasible, potentially significant environmental effects associated with soil and groundwater remediation activities (proposed project, or project) at the Santa Susana Field Laboratory (SSFL, or project site), located in the Simi Hills between Simi Valley and Los Angeles, California (see **Figure 1-1**).

1.1.1 Purpose of this PEIR

As described in Section 15123(a) and 15362 of the CEQA Guidelines, an Environmental Impact Report (EIR) informs public agency decision-makers and the public about a project's potentially significant environmental effects, identifies possible ways to minimize or mitigate, to the extent feasible, any significant effects, and describes reasonable project alternatives. Therefore, the purpose of this PEIR is to focus the discussion on the project's potential environmental effects that DTSC, as the Lead Agency, has determined to be, or potentially may be, significant. In addition, feasible mitigation measures are recommended, when applicable, that could reduce or avoid the project's significant environmental impacts.

This PEIR is considered a combined program- and project-level EIR, in accordance with Sections 15168 and 15161 of the CEQA Guidelines, respectively. A program-level EIR is a type of EIR that allows a public agency to consider broad policy alternatives and program-wide mitigation measures at the early stages of planning. The final proposed cleanup and related infrastructure needed to complete remediation are geographically related because these activities occur in the same footprint. A project-level EIR is a type of EIR that focuses primarily on the changes to the environment that would result from the project, and should examine all phases of the project including planning, construction, and operation. Project-specific analyses have been prepared to the extent that the available investigation and characterization documents present the information regarding the remediation approach and available technologies.



Source: ESA, ESRI, DeLorme (2015).

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Figure 1-1

Regional Location Map

Thus, the combined program and project elements are appropriately analyzed at both a program level and project level of detail. Although limited site locations for facilities are proposed at this time, the ultimate development of additional facilities is recognized as the logical progression for cleanup if the proposed final cleanup is approved. This PEIR therefore includes a dual-level analysis to ensure that the effects of developing and implementing the final cleanup are not segmented, while recognizing that the various components of the final cleanup are at different stages of planning and implementation.

Further, this PEIR was prepared by independent consultants retained by DTSC and reviewed and revised by DTSC for purposes of assessing the potential environmental impacts that may arise in connection with actions related to approval and implementation of this proposed project by California public agencies, as required under CEQA. This PEIR is intended to address the potentially significant adverse effects of the project on the physical environment.

1.2 Background

The following section provides a brief summary of the SSFL site and its historical use. Operational activities at SSFL began in 1948 and primarily included research, development, and testing of liquid-propellant rocket engines, water jet pumps, lasers, liquid-metal heat exchanger components, nuclear energy, and related technologies. The principal activity was large rocket engine testing by Boeing (and its predecessors North American Aviation and Rockwell International), the U.S. Air Force (USAF), and the National Aeronautics and Space Administration (NASA). The majority of the project site was acquired in 1954 and 1958, and development of the western portion of the site began soon after. Liquid-propellant rocket engine testing activities have been conducted at six major rocket engine test areas, beginning in the 1950s: Bowl, Canyon, Alfa, Bravo, Coca, and Delta (ACI and Weitze Research, 2009). The Bowl, Canyon, and Delta test areas were phased out of operation in the late 1960s and 1970s. The Coca test area was shut down in May 1988. The Bravo and Alfa test areas were shut down in 2005 and 2006, respectively.

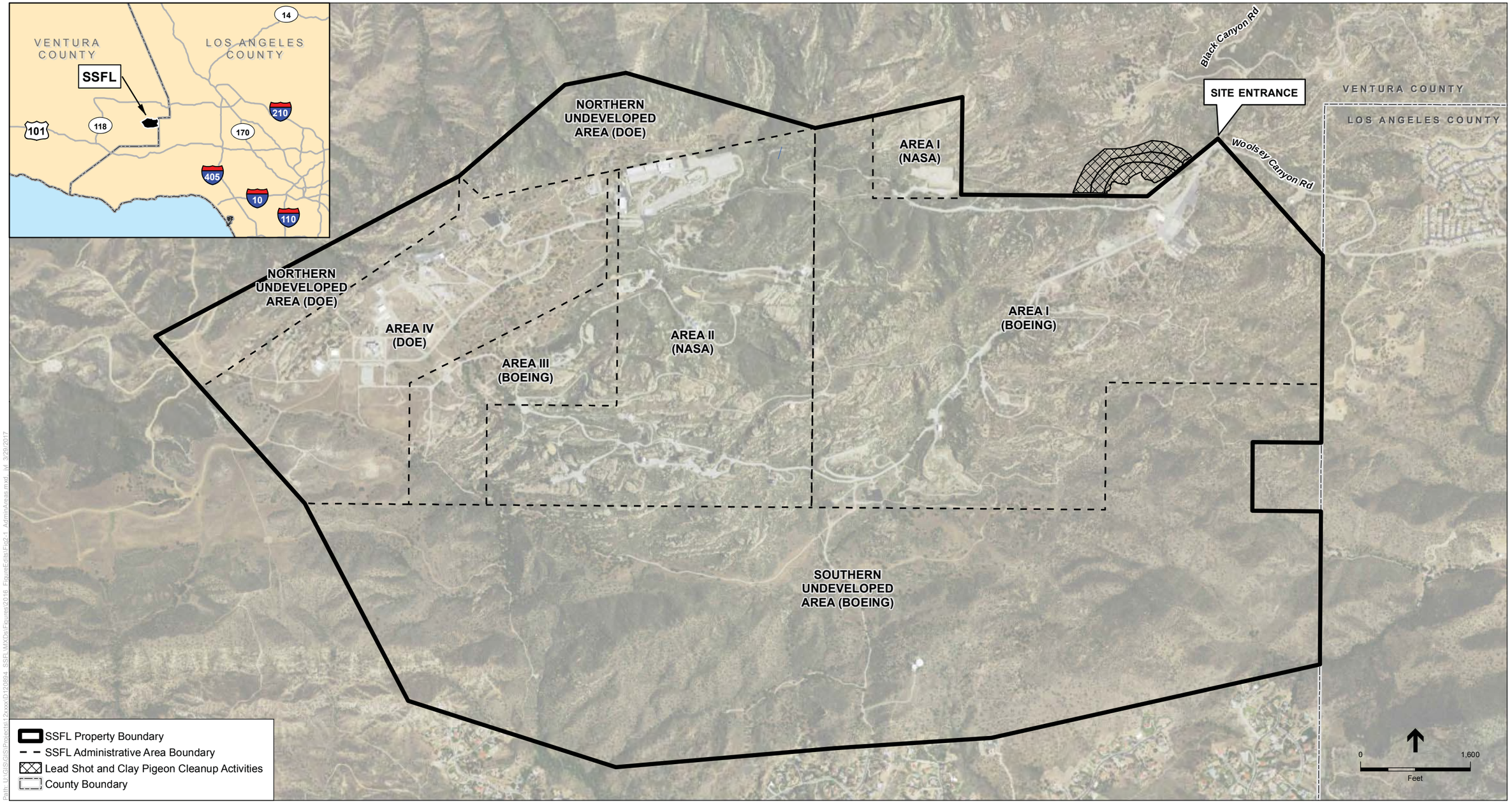
From 1954 to 2001, the Department of Energy (DOE) and its predecessor agency, the Atomic Energy Commission, sponsored nuclear and non-nuclear energy research and development projects at the site (DOE, 2013). The research center was referred to as the Energy Technology Engineering Center. The research and energy development activities included nuclear energy operations (development, fabrication, disassembly, and examination of 10 nuclear research reactors, reactor fuel, and other radioactive materials) and large-scale liquid sodium metal experiments for testing liquid-metal fast-breeder reactor components (HGL, 2011). The last of the nuclear reactors was shut down by 1974 and the remaining nuclear energy research and handling of nuclear materials ended by 1988 (DOE, 2013).

The past operational activities at SSFL resulted in the release of chemicals of concern to both soil and groundwater. Engine testing in the six rocket engine test areas primarily used petroleum-based compounds as fuel and liquid oxygen as the oxidizer. Solvents, primarily trichloroethene (TCE), were used to clean engine components, and for other equipment degreasing operations at SSFL. Petroleum fuel hydrocarbons and chlorinated solvents were used at SSFL in the largest volumes. Another solvent, used in lesser quantities, 1,1,1-trichloroethane (TCA), contained 1,4-dioxane as a stabilizer to increase the longevity and usefulness of the solvent. Solid propellants, including perchlorate compounds, were used at SSFL for research and testing operations. Polychlorinated biphenyls (PCBs) were present in some waste oils as well as oils within pre-1980 electrical transformers at various sites within SSFL.

The nuclear research conducted in Area IV (see **Figure 1-2**) also resulted in the accidental release of radioactive elements to the environment. Radionuclides that have been detected at more than one sample location at levels above the draft Provisional Radiological Look-up Table (LUT) values include cesium-137, strontium-90, plutonium-239/240, cobalt-60, europium-152, plutonium-238, americium-241, and curium-243/244 (DOE, 2013).

The 2010 Administrative Orders on Consent (AOCs) Remediation Standard requires that "no contaminants shall remain in the soil above local background levels," unless the minimum detection limit for a contaminant is above background levels (or other exceptions apply). In this case, DTSC must use the minimum detection limit for the contaminant. DTSC compiled contaminants' provisional background levels and detection limits in a LUT (see Appendix B of this PEIR). This PEIR refers to the AOC Remediation Standard as "AOC background."

Chemical and solid wastes created from facility operations have been managed through various methods. Three landfills were used at SSFL primarily for disposal of non-hazardous, inert construction debris (concrete, asphalt, rock, soil, etc.). Liquid wastes from engine testing were managed until the 1980s in a series of both flow-through and retention ponds. Ten of these ponds (impoundments) have undergone closure: one was clean-closed and nine were closed as Resource Conservation and Recovery Act (RCRA)-regulated units, managed under the Post-Closure Permit, described in Chapter 3.0, *Project Description*, of this PEIR. After closure of these impoundments, wastes were managed for offsite recycling, treatment, or disposal. Radioactive and mixed wastes were managed for offsite disposal at the onsite Radioactive Materials Handling Facility (RMHF); non-radioactive, alkaline, and liquid-metal wastes were managed and treated at the onsite Hazardous Waste Management Facility (HWMF). The onsite Thermal Treatment Facility (TTF) was used for open burn/open detonation of hypergolic, reactive, and explosive wastes.



SOURCE: ESA; ESRI; Boeing 2016; MWH 2016

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Figure 1-2

Administrative Areas

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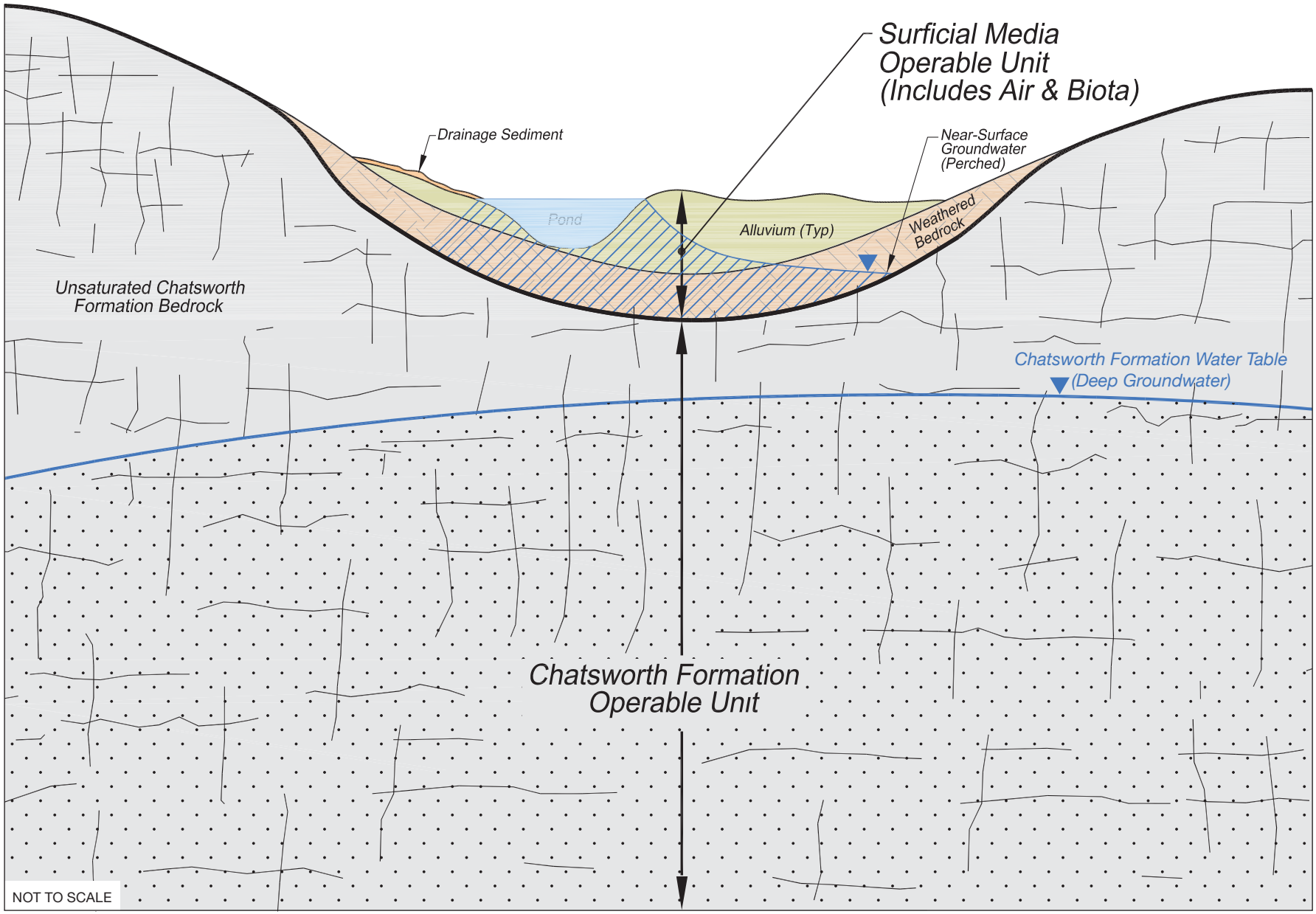
1.2.1 Regulatory History & Authority

During the operational years of 1948 through 2006, SSFL was regulated under the jurisdiction of a number of regulatory agencies and programs. These programs addressed hazardous materials storage and use, waste management, and site cleanup for active facilities during their operational life, as well as closure, post-closure, and cleanup actions for post-operational facilities and programs. Operational programs are no longer active since all research and development ceased as of 2006.

Cleanup (i.e., remediation) of soil, groundwater, and related media at SSFL will be conducted under the Corrective Action Program of the Resource Conservation and Recovery Act (RCRA), which provides a framework to remediate hazardous waste sites in the United States. This authority under RCRA can be delegated to states. In California, DTSC implements RCRA under such delegated authority from the U.S. Environmental Protection Agency (USEPA) through state law, specifically Chapter 6.5 of Division 20 of the California Health and Safety Code (the California Hazardous Waste Control Law, Sections 25100 et seq. of that Code). In addition, the cleanup of soil by the federal agencies - DOE and NASA - is being conducted under the State Superfund Authority, specifically Chapter 6.8 of Division 20 of the California Health and Safety Code (the Hazardous Substances Act, Sections 25300 et seq. of that Code). Because of their role in causing the contamination at the project site, NASA, DOE, and Boeing are referred to as "Responsible Parties" (RPs), which means they are responsible for conducting required investigations and cleanups of contaminants released from past activities at the project site.

Investigation and cleanup requirements at the project site are further defined in the 2007 Consent Order for Corrective Action (2007 Consent Order) (DTSC, 2007) and the 2010 AOCs for Remedial Action (DTSC, 2010a, 2010b). The 2007 Consent Order and the 2010 AOCs establish the requirements for the investigation and cleanup of soil and groundwater at the project site (please refer to Chapter 2.0, *Introduction*, of this PEIR, for more detail on the regulatory history of SSFL). The RPs will prepare draft project-specific cleanup documents for each area requiring cleanup. The public will have an opportunity to review and comment on these draft documents. Thereafter, DTSC will issue final cleanup decision documents that describe each RP's project-specific cleanup requirements for each area requiring a cleanup.

The 2007 Consent Order is the initial agreement that DTSC and the three RPs entered into to define the requirements for investigating contaminated soil and groundwater, and to implement the cleanup at SSFL. However, in 2010, NASA and DOE entered into subsequent, separate AOCs with DTSC. The 2010 AOCs establish the process to investigate and cleanup soil within NASA's and DOE's administrative areas. The 2007 Consent Order continues to define the groundwater investigation and cleanup requirements for all of SSFL, and soil investigation and cleanup requirements within Boeing's administrative areas. As a result of these separate orders, the soil cleanup requirements for Boeing areas are different from the soil cleanup requirements for DOE and NASA areas.



SOURCE: Adapted from MWH 2013

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Figure 1-3

Cross Sectional Depiction of Operable Units

As set forth in the regulatory orders, the soil cleanup requirements for the project site would be based on property administration. For this PEIR, the soil cleanup requirements for the NASA and DOE areas are referred to as "AOC background" values. Pursuant to the 2007 Consent Order, soil cleanup requirements for Boeing's areas are based on risk-based levels (see Sections 2.2.3.2 and 2.2.3.5 in Chapter 2.0, *Introduction*, of this PEIR). Cleanup of contamination from Boeing areas onto DOE or NASA managed properties would require coordination between Boeing, and DOE or NASA, respectively, but the soil cleanup for the DOE and NASA managed areas is governed by the 2010 AOCs (e.g., Boeing may conduct soil excavation to risk-based cleanup levels on the DOE or NASA managed property, but DOE or NASA are responsible for ensuring the soil cleanup is consistent with the 2010 AOCs).

Offsite property owners have the same input on access and cleanup levels that would affect their property. If offsite impacts are identified in a project-specific cleanup plan, the respective RP(s), in conjunction with DTSC, would coordinate with affected offsite property owners during development of proposed project-specific cleanup plan. Any onsite or offsite decision on cleanup levels for affected property(ies) would be proposed in a project-specific draft cleanup decision document. This document will be provided to the public for review and comment. Thereafter, DTSC will approve a final project-specific cleanup decision document.

The 2007 Consent Order separates the project site into two Operable Units (OUs), the Surficial Media OU and the Chatsworth Formation OU. According to USEPA, a site can be divided into a number of distinct areas depending on the complexity of the problems associated with the site. These areas, called "operable units," may be defined by various attributes, including characteristics of the contaminated media, geographic location, vertical and aerial considerations, specific site problems, and potential exposure pathways. The primary components of the Surficial Media OU include soil, sediment, and weathered bedrock. The Surficial Media OU also includes surface water, near-surface groundwater, air, and biota, as presented in Figure 1-3. The primary component of the Chatsworth Formation OU is deep groundwater.

The Chatsworth Formation OU also includes unsaturated, unweathered bedrock. The 2010 AOCs are not differentiated by OUs and apply only to soil, as defined in the 2010 AOCs. For the purposes of this PEIR, cleanup methods for soil, sediment, surface water, and weathered bedrock are grouped together, and groundwater (both near surface and deep groundwater) and unsaturated, unweathered bedrock are grouped together. These groupings are made in the PEIR for readability because cleanup technologies for these media are similar, as opposed to grouping by OU.

1.3 Summary of the Proposed Project

The proposed project involves the approximately 2,850-acre SSFL site located in the southeastern-most part of Ventura County and adjacent offsite locations. Boeing, NASA and DOE are the RPs for the investigation and cleanup of contaminants released from past activities at the project site. The 2007 Consent Order and the 2010 AOCs establish the requirements for the cleanup for soil and groundwater at the project site. As the result of the separate orders, the cleanup requirements for groundwater are derived from the 2007 Consent Order and are the same for all three RPs. The following describes the project location, project objectives, and the requirements for soil and groundwater cleanup, respectively.

1.3.1 Project Location

The project site is located in the southeastern-most part of Ventura County and adjacent to Los Angeles County, approximately 29 miles northwest of downtown Los Angeles, California. The city of Simi Valley is located approximately one mile to the north of the project site. Open space associated with the Upper Las Virgenes Canyon Open Space Area and Cheeseboro/Palo Comado Canyons is located to the west of the project site. The residential community of Bell Canyon is located directly south of the project site. San Fernando Valley communities, including Canoga Park, West Hills, and Chatsworth, in the city of Los Angeles are located to the east. Figure 1-1 shows the regional location of the project site and surrounding communities.

Regional access to the project site is provided via east-west State Route (SR) 118, which is located approximately 2 miles north of the project site and can be accessed by north-south Interstate 405 (I-405) and I-5 located east of the project site (see Figure 1-1). The east-west United States Route (US) 101 is located approximately 4.5 miles south of the project site and also provides regional access. Topanga Canyon Boulevard (SR 27) is located approximately 3.5 miles east of the project site and links SR 118 and US 101.

Local access to the project site is limited, and provided by Service Area Road at the northeast corner of the site, which can only be accessed by Woolsey Canyon Road from Chatsworth to the east or by Black Canyon Road from Simi Valley to the north.

The RPs have been investigating their respective areas to identify the nature and extent of contamination related to the SSFL site operations. This investigation includes contiguous areas where contaminants may have migrated. **Table 1-1** includes the estimated acreages within each administrative area. Cleanup acreages would be finalized after the RPs' investigations of the areas are complete and cleanup requirements are approved by DTSC.

TABLE 1-1
SUMMARY OF SSFL SITE OWNERSHIP AND RESPONSIBLE PARTY ACREAGES

Administrative Area	Property Owner	Responsible Party [A]	Administrative Area Acreage [B]
I	Boeing	Boeing	672
I	Federal Government	NASA	42
II	Federal Government	NASA	404
III	Boeing	Boeing	119
IV	Boeing	DOE	290
Northern Undeveloped [C]	Boeing	DOE	182
Southern Undeveloped [C]	Boeing	Boeing	1,140
Total Project Site			**2,850[D]**

NOTES:
A. The RP designations refer to soil cleanup. The list of RPs may differ for groundwater cleanup depending on the source and migration pathways of affected groundwater.
B. Acreages are estimated and include all property within the area assigned to the identified RP.
C. The Northern and Southern Undeveloped Areas are also referred to as Buffer Zones in other historical documents.
D. The total site acreage is rounded to the nearest 10 to match historical documents, but the sum of the separate areas listed in Table 1-1 is actually 2,849 acres. Also, on December 1, 2009, the "Alta Survey" was conducted. The results of this survey are currently under discussion. Specifically, the east-west trending boundary between Areas II and III and the boundary between the Liquid Oxygen Plant and the remainders of Area I may be subject to modification. The potential boundary changes, if accepted, are minor in scope and are unlikely to affect any conclusions in this document; however, this should be clarified in future documents to prevent inconsistencies specifically related to administrative area acreages.

As shown in Figure 1-2, the project site is divided into administrative Areas I through IV, and the Northern and Southern Undeveloped Areas (also referred to as buffer zones in other documents). These administrative areas generally represent land ownership, cleanup responsibility, and cleanup requirements, and are referenced in this document to provide approximate location information for cleanup requirements (as explained in more detail in Section 3.3, *Regulatory Orders and Cleanup Requirements*, of this PEIR) and features within the overall project site.

1.3.2 Project Objectives

Past activities at SSFL have resulted in the release of contaminants to soil and groundwater. In support of DTSC's responsibility to protect human health and the environment, DTSC has directed the RPs to investigate the nature and extent of the releases and implement corrective actions to clean up the affected areas. The primary objective of the proposed project is to implement the 2007 Consent Order and the 2010 AOCs at SSFL. As part of implementing the Orders, DTSC is required to base any decision on the USEPA National Contingency Plan and associated USEPA guidance documents to implement the 2007 Consent Order and the 2010 AOCs. In addition, per USEPA regulation (OSWER Directive 9355.7-19, March 17, 2010), DTSC considers the reasonably anticipated future land use of the site during the remedy selection process.

DTSC's overall project objectives are based on the National Contingency Plan (40 CFR 300.430 (e)(9)(iii)) criteria. These are grouped into three categories: primary, or "threshold," criteria; secondary, or "balancing," criteria; and additional "modifying" criteria.

Assessments against the following two of the criteria relate directly to statutory findings. Therefore, these are categorized as primary or "threshold criteria" that each alternative must meet:

1. Protect human health and the environment, attain soil and groundwater cleanup standards, and control of source(s) of releases. This can be done by ensuring exposure pathways are controlled, eliminated, or reduced through treatment, engineering controls, or institutional controls.
2. The cleanup for soil and groundwater must comply with applicable, relevant and appropriate laws, regulations and requirements.

To aid the decision making bodies in their review of the project and the environmental impacts and alternatives to the cleanup, the following criteria are assessed and considered:

3. Long-term effectiveness and reliability (after remedial activities are complete) in protecting human health and the environment (inclusive of surrounding communities) from exposure to materials containing contaminants above applicable cleanup requirements.
4. Reduction of toxicity, mobility, and/or volume of contaminated media.
5. Short-term effectiveness (during implementation/construction activities) in protecting human health and the environment (inclusive of surrounding communities) from exposure to materials with contaminants above applicable cleanup requirements.
6. Ability to implement the remedial activities, including feasibility to construct and operate, administrative feasibility and availability of services and materials.
7. Remediate the site in an expedient and cost-effective manner.
8. Community input during a formal public comment period on the cleanup decision document.

The following are some SSFL-specific elements of the above criteria:

- For contaminants that have already migrated offsite (e.g., groundwater), prevent further migration of the contaminants and mitigate any exposure pathways.
- For soils, continue to prevent the migration of contaminants that pose a threat to offsite areas.
- Implement the proposed project in a manner that is compatible with Ventura County's reasonably anticipated future land use designation of the property.
- Recognize the unique biological and cultural significance of the project site through protection of resources to the extent practicable and consistent with applicable laws and regulations for such resources.
- Use in situ methods, to the extent practicable, to minimize physical impacts to the environment.

1.3.3 Description of the Proposed Project

As a part of the investigative process, an initial screening of potential remedial approaches and technologies to clean up contaminated soil and groundwater at SSFL has been conducted. The RPs, under the direction of DTSC, are continuing to evaluate the approaches and technologies as they complete characterization of the nature and extent of the contaminants. The PEIR includes an evaluation of remedial technologies necessary to address the different types of contaminated land and water resources, the wide variety of contaminants present, and the unique and varied conditions at the site (topography, vegetation, access, sensitive biological and cultural resources, etc.).

While the PEIR includes an initial assessment of the estimated extent and location of each remedial technology based on the activities proposed by each of the RPs, DTSC may approve final remediation methods that revise these initial assessments. To provide for flexibility in the design of the final cleanup strategy, the information regarding each of the proposed remedial technologies is presented in the sections that follow, and the subsequent environmental analysis presents an evaluation of potential impacts with consideration of different strategies or methodologies. Additional environmental analysis is included for a set of initial activities (as described in Section 3.7, *Initial Activities*, of this PEIR) proposed for the site (as described in Section 2.1.2, *Future Review of Project-Level Designs*, of this PEIR) based on the greater level of detail that was available for the initial activities at the time this PEIR was prepared.

Future development of the site is not a part of the proposed project; therefore, impacts of future development of the site are not evaluated in this PEIR. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to safeguard human health and environmental quality, including by cleaning up the land and improving the quality of surface waters, groundwater, and downstream receiving waters in a manner consistent with the 2007 Consent Order and the 2010 AOCs. When overseeing cleanup actions that are protective of human health and the environment, consistent with USEPA regulations and guidance (OSWER Directive 9355.7-19, March 17, 2010), DTSC considers the reasonably anticipated future land use of the site during the remedy selection process. The proposed project would not change the current use of the site and the proposed cleanup level would not conflict with the allowable uses identified for the RA-5, AE-40 and OS-160 zones. The groundwater remedies may include restrictions that would require DTSC approval prior to any future groundwater use or production well installation. Any future development would be subject to other discretionary actions by the County of Ventura or other government agencies (potentially including DTSC, depending on the circumstance), including environmental review as appropriate pursuant to CEQA.

The 2007 Consent Order establishes the decision-making process for the cleanup of contaminated soils at Boeing's property. The 2007 Consent Order identifies the types of chemicals to be cleaned up and requires the actual cleanup of soil contaminated by those chemicals be decided "utilizing the Standardized Risk Assessment Methodology (SRAM)" for SSFL (Section 2.5). Section 3.5.2 in the 2007 Consent Order also specifically states: Cleanups plans "shall detail the methodology for developing and evaluating potential corrective measures [cleanup actions] to

remedy chemical contamination at the Facility utilizing the Standardized Risk Assessment Methodology (SRAM) Workplan (Rev. 2)."

The DTSC-approved Final Standardized Risk Assessment Methodology Revision 2 Addendum, (August 2014) (SRAM, page 5.6) contains information to assess risks for a number of different land use scenarios, but states: "As a most conservative measure, residential land use, as described in the conceptual site model (Section 4) will be evaluated as the future land use scenario." In other words, the SRAM must assess a wide variety of risks at the property including residential uses as authorized by County zoning rules. Consistent with applicable law, the SRAM also goes on to state: "Final decisions regarding remediation will be based on weight-of-evidence evaluations performed using criteria such as the nine National Contingency Plan (NCP) balancing criteria found in Title 40 of the Code of Federal Regulations (40 CFR) Part 300.430 (e)(9)(iii)." (SRAM, Methodology for the Calculation of Human Health Risk-Based Screening Levels for Chemicals in Soil at the SSFL, Attachment 1: Risk-Based Screening Levels Calculation Approach and Equations, page 2).

On April 24, 2017, Boeing filed a conservation easement for its portion of SSFL. The easement's purpose is to have the North American Land Trust manage and maintain the property consistent with preserving, protecting, and maintaining in perpetuity the property's Conservation Values. The easement's Conservation Values include the area's habitat, open space, cultural resources, and scenic, educational, scientific, and recreational values. The easement further refines its purpose to include the primary purposes (habitat, open space, and cultural resources) and, to the extent consistent with primary purposes, other conservation values (e.g., scenic, historic, educational, scientific, and recreational).

Notwithstanding the recording of the conservation easement, the PEIR analyzes the environmental impacts of the most extensive set of cleanup activities evaluated and proposed for the Boeing project, Suburban Residential use with garden consumption of 25 percent of total diet. The PEIR's analysis captures the environmental impacts of a cleanup for less intensive land use scenarios that could result in removal of less soil and sediment from the project site, a smaller project footprint, and a shorter project duration.

1.3.3.1 Overall Site Cleanup

Soil Remediation

The estimated soil cleanup volumes and acreage presented in this PEIR for the Boeing portion of SSFL are based on the Suburban Residential with garden consumption of 25 percent of total diet, and provide a reasonable volume estimate for this PEIR. In addition, DTSC reviewed the investigation and characterization data and concluded that the acreage and volume estimates provided by DOE and NASA are reasonable estimates to achieve the "AOC background" values (see **Tables 1-2** and **1-3**). **Figure 1-4** shows the footprint of the soil areas to be remediated.

TABLE 1-2
SUMMARY OF PROJECT SITE OWNERSHIP, ACREAGE, AND CLEANUP RESPONSIBILITY

Administrative Area	Property Owner	Responsible Party [A]	Administrative Area Acreage [B]	Estimated Soil Cleanup Acreage [B, C]	Cleanup Requirement
SSFL					
I	Boeing	Boeing [D]	672	51	Risk-based
I	Federal Government	NASA [E]	42	14	AOC
II	Federal Government	NASA	404	193	AOC
III	Boeing	Boeing	119	15	Risk-based
IV	Boeing	DOE [E, L]	290	217	AOC
Northern Undeveloped [F]	Boeing	DOE [L]	182	12	AOC
Northern Undeveloped [F]	Boeing	NASA [H, M]	0	6	AOC
Southern Undeveloped [F]	Boeing	NASA [H, M]	0	12	AOC
Southern Undeveloped [F]	Boeing	Boeing	1,140	1	Risk-based
Subtotal - SSFL Acreage			**2,850 [K]**	**521**	
Offsite Areas					
Drainage Areas to the north	American Jewish University	DOE [L]	--	<1	AOC [I]
Drainage Areas to the north	American Jewish University	NASA [M]	--	<1	AOC [I]
Drainage Areas to the north [G]	Mountains Recreation and Conservation Authority	Boeing	--	<1	Risk-based [I]
Former Rocketdyne Employee Shooting Range	Mountains Recreation and Conservation Authority	Boeing [J]	--	9 [J]	Risk-based [I]
Subtotal - Offsite Areas			**0**	**<20**	
Total Project Site			**2,850 [K]**	**541**	

NOTES:
AOC = Administrative Order of Consent

A. The RP designations refer to soil cleanup. The list of RPs may differ for groundwater cleanup depending on the source and migration pathways of affected groundwater.
B. Cleanup acreages would be finalized after the RP investigations of the areas are complete, and cleanup decision documents are approved by DTSC.
C. Summary acreages are approximate, rounded to the nearest whole number and are based on the most recent available data.
D. Boeing soil cleanup volumes presented in this table represent a maximum volume estimate of soil/sediment requiring remediation. DTSC developed the estimate based on the Suburban Resident and 25 percent garden uptake. Additional detail on assumptions and calculations may be found in Appendix K. Further characterization and analysis may result in adjustments to these volume estimates; final soil volumes will be provided in the final decision documents.
E. The DOE and NASA estimated acreages do not account for any AOC exceptions or contingency. DTSC, after input from supporting regulatory agencies, may approve AOC exceptions consistent with the limitations on such exceptions, including the requirements stated in the existing applicable 2010 AOCs, 2007 Consent Order, and DTSC policy and provided they would not violate federal, state, or local laws and regulations, including CEQA Guidelines, to appropriately preserve biological and cultural resources. DTSC will make its decision regarding final remediation areas when approving cleanup decision documents and consider additional input during a separate public comment period associated with those documents. The first step in implementing an AOC exception would be to assess if there is an adverse impact in an area that qualifies for an exception. If there is no adverse impact, cleanup would commence. If an adverse effect that cannot be mitigated is identified, DTSC would consider implementing an exception.
F. The Northern and Southern Undeveloped Areas are also referred to as Buffer Zones in other historical documents.
G. Boeing soil cleanup acreages in the drainage areas to the north include impacts from operations and cleanup required under the 2007 Consent Order.
H. NASA proposed cleanup on Northern and Southern Undeveloped Areas is due to contiguous chemical impacts emanating from former NASA operations. NASA does not, and never has owned any portion of either undeveloped area. Cleanup levels for these areas would be determined based on applicable cleanup orders and property owner rights as described in Section 3.3 of this PEIR.
I. While the sediment sample results are above LUT values, they do not pose a threat to human health or the environment.
J. Lead shot removal cleanup activities to be performed by Boeing under DTSC oversight. Acreage provided based on approximate extent of lead shot and clay pigeons north of the drainage; cleanup locations would be based on ongoing characterization work.
K. The total site acreage is rounded to the nearest 10 to match historical documents, but the sum of the separate areas listed in Table 1-1 and Table 1-2 is actually 2,849 acres. Also, on December 1, 2009, the “Alta Survey” was conducted. The results of this survey are currently under discussion. Specifically, the east west trending boundary between Areas II and III and the boundary between the Liquid Oxygen Plant and the remainders of Area I may be subject to modification. The potential boundary changes, if accepted, are minor in scope and are unlikely to affect any conclusions in this document; however, this should be clarified in future documents in order to prevent inconsistencies specifically related to administrative area acreages.
L. DOE acreage estimates are based on Geographical Information System Data (DOE, 2014).
M. NASA acreage estimates are based on the Draft Data Summary Report, dated May 2015a.

TABLE 1-3
ESTIMATED SOIL REMEDIATION VOLUMES [A]

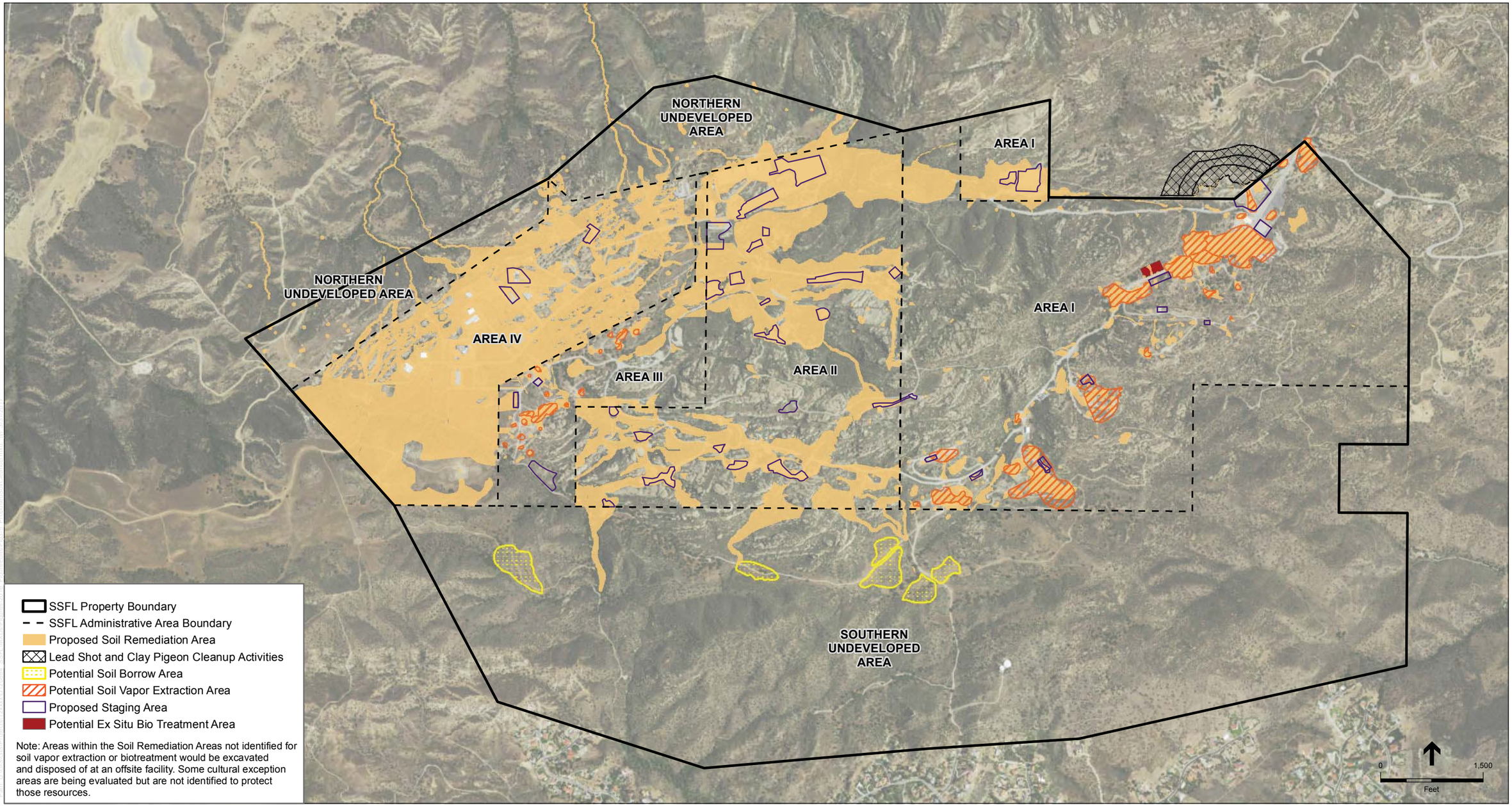
Remediation Method	Boeing [A,B]	DOE [A,C]	NASA [A,D]	Total [A]
Excavation & Offsite Disposal	390,000	1,260,000	870,000	2,520,000
Monitored Natural Attenuation	TBD [E]	TBD [E]	TBD [E]	150,000 [E]
Soil Vapor Extraction [B]	500,000	-	-	500,000
In Situ Biological Treatment [B, F]	15,000	-	-	15,000
Ex Situ Biological Treatment [B,G]	16,000	-	-	16,000
	921,000	**1,260,000**	**870,000**	**3,201,000**

A. All volumes in this table refer to cubic yards (CY) for in situ soils. Variations in the overall volume assumptions are based on individual RP progress on preparation of cleanup decision documents, and DTSC's review of these documents, as well as individual site cleanup strategies as described below.
B. Boeing soil cleanup volumes presented in this table represent a maximum volume estimate of soil/sediment requiring remediation. DTSC developed the estimate based on the Suburban Resident and 25 percent garden uptake. Additional detail on assumptions and calculations may be found in Appendix K. Further characterization and analysis may result in adjustments to these volume estimates; final soil volumes will be provided in the final decision documents.
C. The DOE soil cleanup volumes presented in this table represent conservative volume estimates based on information provided in DOE, 2015. The estimate reflects a greatest degree of impact scenario because it includes areas that maybe in sensitive cultural and biological conservation areas that may be subject to exception. Also, the estimate for monitored natural attenuation (MNA) represents the volume of soil where it is anticipated that chemical impacts would be reduced through natural processes and such progress would be actively monitored and confirmed by the RPs under DTSC oversight. Further justification and evaluation of the appropriateness of each anticipated action will be presented in final cleanup decision documents. DOE's excavation volume of 1,260,000 CY in this table is different from the 2017 DOE EIS volume of 933,000 CY because DOE assumed application of an AOC exception to 330,000 CY of soil; but DTSC's estimated excavation volume for DOE represents cleanup to "AOC Background" values, which does not include application of exceptions.
D. NASA's soil volume represents a change from the 500,000 CY that was presented in NASA's March 2014 EIS, because the 2014 value was an estimate based on preliminary data. The current estimate of 870,000 CY is presented in NASA, 2015d and is considered a greatest degree of impact scenario because it includes areas that maybe in sensitive cultural and biological conservation areas that may be subject to exception. The soil volume estimate is subject to further refinement during development of cleanup decision documents.
E. The amount of soil that would be treated through MNA has not yet been determined for Boeing, DOE, and NASA. A volume estimate and evaluation of the appropriateness will be presented in the cleanup decision documents. For purposes of the PEIR, the disposal volume assumes that 150,000 CY would be amenable to MNA.
Although the amount of soil that would be treated through MNA has not yet been determined, MNA would address a portion of the soil volumes currently identified for cleanup and no additional soil volume is expected to be identified.
F. Includes anaerobic and aerobic methods.
G. Includes land farming, oxidation, and thermal desorption.

CY – cubic yards
TBD – to be determined

Based on this assessment, roughly 541 acres at the project site or in immediately adjacent areas are targeted for some level of remedial action. A variety of remedial technologies would be considered for soil cleanup; however, their application to the SSFL cleanup depends on the results of the treatability studies, as described below:

- **Excavation and Offsite Disposal:** This method would be used for remediating most of the soil with contaminant concentrations above cleanup requirements. Excavation would involve the physical removal of the affected soil from the project site, hauling to an offsite disposal facility, partial backfilling to generally restore previous topographic grades and slopes without creating ponding, surveying (to document final excavation and restoration/backfill conditions), and vegetation restoration, if necessary. Refer to Section 3.6.1.1, *Excavation and Offsite Disposal*, of this PEIR for a detailed description of the main components of soil excavation and offsite disposal.



SOURCE: ESA 2016; Boeing 2016; DOE 2012; NASA 2016

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Figure 1-4

Proposed Soil Cleanup Areas

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- **Soil Vapor Extraction:** Soil Vapor Extraction (SVE) is considered to be a potential remediation technology for VOCs in soil, where VOCs are the only contaminants present or where SVE would reduce the volume or toxicity of soil to allow reduced remediation by other methods (i.e., excavation and disposal). The approximate areas that are proposed to be cleaned up using SVE are shown in Figure 3-5 in Chapter 3.0, *Project Description*, of this PEIR. Based on existing data for soil vapor plumes, the total in situ volume of soil identified for potential SVE remediation would be approximately 500,000 CY (Table 3-2). Refer to Section 3.6.1.2, *Soil Vapor Extraction*, of this PEIR, for a detailed description of SVE technology.
- **Biological Treatment:** Biological treatment (including bioaugmentation and biostimulation) refers to oxidation-reduction (redox) reactions facilitated by microorganisms that can degrade, transform, or remove contaminants from soil and groundwater. Biological treatment relies on naturally occurring or supplemental bacteria or fungi to degrade, transform, or remove contaminants. Ideally, metabolic processes of the organisms, at completion, convert contaminants into nontoxic by-products (e.g., carbon dioxide and water). The feasibility of this remediation option is being evaluated and would be implemented to the extent practical depending on the results of the treatability study documents. Approximate volumes of soil to be remediated using biological treatment are listed in Table 1-3 and general areas to be cleaned up using biological treatment methods are shown in Figure 3-5 in Chapter 3.0, *Project Description*. Refer to Section 3.6.1.3, *Biological Treatment*, of this PEIR, for a detailed description of biological treatment methods.
- **Phytoremediation:** Phytoremediation refers to the use of plants to remediate chemicals of concern in contaminated media. There are multiple types of phytoremediation mechanisms, including Phytoextraction, Phytovolatilization, Rhizosphere degradation, Phytodegradation, and Phytostabilization, each of which is applicable to certain contaminant groups or types (Boeing, 2013). Phytoremediation is a long-term remediation technology, most applicable in areas where the source of contamination is no longer present and most of the contamination has been removed by other treatment mechanisms. Refer to Section 3.6.1.4, *Phytoremediation*, of this PEIR, for a detailed description.
- **Physical Remediation:** Physical Remediation includes the following methods: soil washing and partitioning, soil solidification/stabilization, and thermal desorption. Refer to Section 3.6.1.5, *Physical Remediation Methods*, of this PEIR, for a detailed description of the different physical remediation techniques.
- **Capping and Onsite Management** (Boeing only): Capping technologies may be applied to soil/sediment areas where contaminants are not amenable to treatment, or in areas where excavation/offsite disposal or other types of treatment for the entire soil volume is not feasible or practical. In these cases, clean soil or an engineered cap composed of soil, gravel, clay, and or various synthetic liners may be placed over the contaminated soil to prevent future exposure (Boeing only). Refer to Section 3.6.1.6, *Capping and Onsite Management*, of this PEIR, for a detailed description of capping.

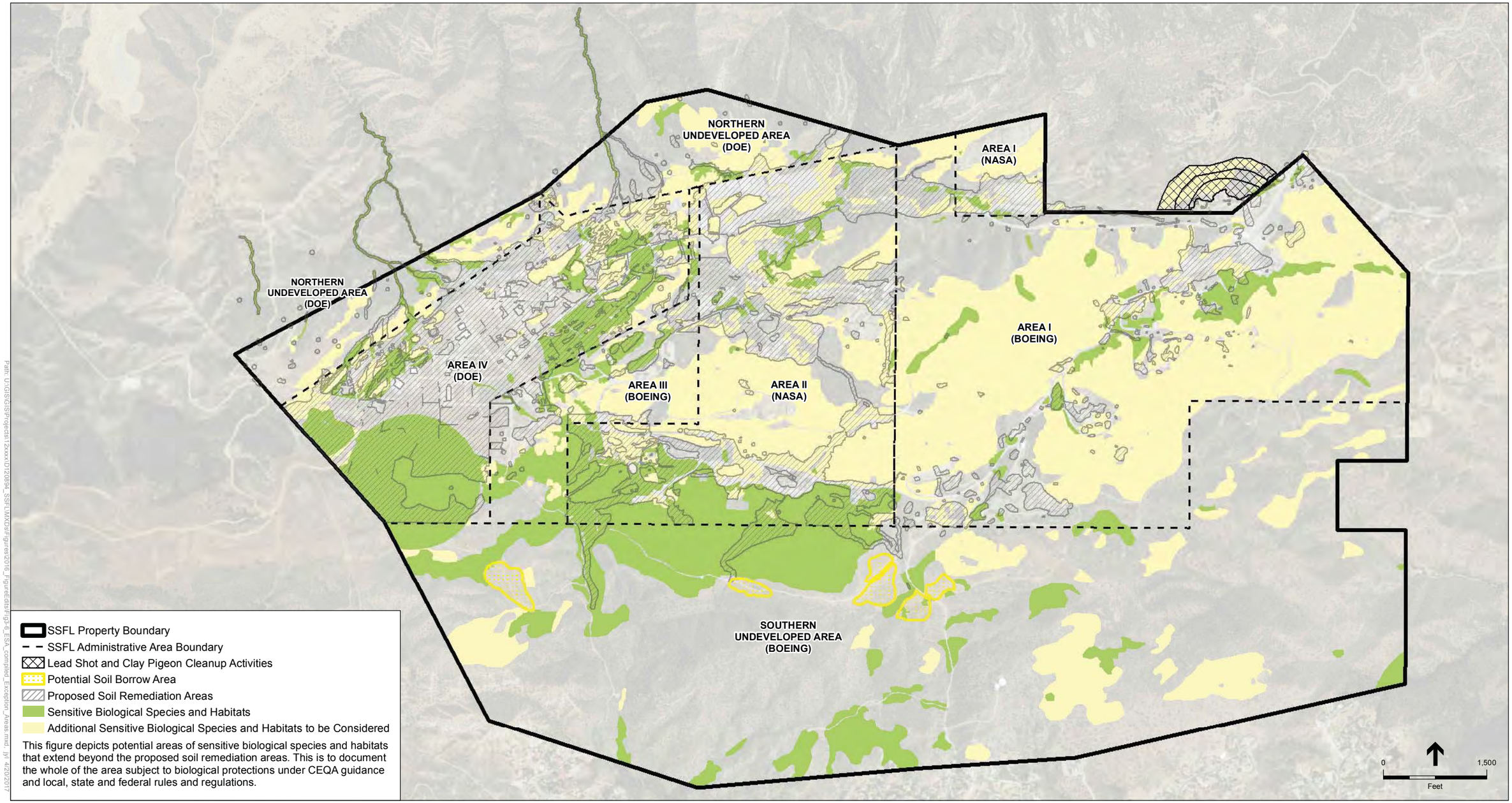
Certain areas of contaminated soil are located within sensitive biological resources (habitat or species specifically protected under the federal or California Endangered Species Acts; based on CEQA Guidelines in the California Public Resource Code; or Ventura County ordinances, management plans, or General Plan) or cultural resource (e.g., Native American or paleontological artifacts) zones. In these areas, remediation options may be more limited and cleanup goals may be adjusted to accommodate the protection of such resources.

These measures are consistent with the 2007 Consent Order and 2010 AOCs, which require cleanup actions to be conducted in accordance with local, state, and federal laws, including laws and regulations that protect biological and cultural resources. The biological and cultural resources protections are described as "exemptions" in the 2010 AOCs and as "exceptions" in the Final Agreement in Principal (AIP).[1] For ease of reference, this PEIR uses "exceptions" to describe these protections for all RPs, even though Boeing is not subject to the AOCs. The exercise of these exceptions is subject to DTSC's oversight and approval. **Figure 1-5** shows the general footprint sensitive species and habitats, and cultural resource areas, but not the exact location. Cleanup decision documents will identify the final soil cleanup areas earmarked for exception and the reasoning for each exception. However, these documents will not designate each specific location in order to protect these important resources.

The remediation volumes in Table 1-3 represent a conservative, upper-range estimate of soil potentially requiring cleanup. This estimate presents an upper-range scenario since it includes areas that may be in sensitive cultural and biological exception areas, and does not include cleanup by in situ remediation methods, other than by biological or natural attenuation remediation methods. **Table 1-4** presents a breakdown of the estimated volumes of non-hazardous, hazardous, and radiological or mixed soil wastes ("mixed waste" is defined as containing both radioactive and hazardous waste constituents) requiring offsite disposal. Final soil volume estimates will be published once soil cleanup decision documents are completed.

The daily maximum number of trucks visiting the site for export and import of materials would be 96 round trips (resulting in 192 total trips) in total for all RPs combined. This maximum would represent all types of truck trips, including: equipment deliveries, excavation spoils, building demolition debris, and delivery of backfill soil. For planning purposes, it is assumed that the actual number of trucks would range between approximately 48 truck trips (round trips) and a maximum of 96 round trips. This predicted variability is based on factors such as different areas and RPs decision documents and cleanup schedules, the complexity of various projects stages (e.g., building removal, excavation, backfilling, and confirmation sampling), coordination between multiple RPs, determination of final soil excavation volumes, and project initiation and ability to ramp up overall production given the nature of the SSFL project as a whole.

[1] On September 3, 2010, DOE and NASA agreed to a Joint Settlement Framework in the AIP, which is incorporated into the AOCs as Attachment B. DOE and NASA agreed that their cleanup obligations with respect to soil contamination at the site shall be conducted in accordance with and be governed by the AIP. While the AOCs generally provide for "exemptions," these measures are defined in the AIP in detail and are referred to as "exceptions." As such, in this PEIR, DTSC refers to these provisions as "AOC exceptions" or "exceptions."



SOURCE: DOE 2012; Boeing/MWH 2016; USFWS 2016; ESA 2016

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Figure 1-5

Potential AOC Exceptions Areas

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TABLE 1-4
ESTIMATED VOLUMES OF SOIL WASTE TYPES

	NASA		DOE		Boeing		Total	
Soil Waste Type	**Soil (CY)**	***Trucks*** [B]	**Soil (CY)**	***Trucks*** [B]	**Soil (CY)**	***Trucks*** [B]	**Soil (CY)**	***Trucks*** [B]
Nonhazardous [A]	148,000	*9,650*	1,123,000	*73,260*	310,000	*20,220*	**1,581,000**	***103,130***
Hazardous [A]	696,000	*45,400*	49,000	*3,200*	63,000	*4,110*	**808,000**	***52,710***
Soil exceeding Presumptive Rad LUT [A]	26,000	*1,700*	91,000	*5,940*	0	*0*	**117,000**	***7,640***
Radiological/Mixed [A]					17,000	*1,110*	**17,000**	***1,110***
Total	**870,000**	***56,750***	**1,263,000**[C]	***82,400***	**390,000**	***25,440***	**2,523,000**	***164,590***

NOTES: All soil volumes in this table are presented as CY and are rounded to three significant digits
All soil volumes presented are estimates as described in Section 3.6.1 and Table 3-3.

A. Soil waste type ratios are based on historical interim source removal actions and correspondence between each RP and DTSC (NASA, 2015c; Boeing, 2015a; DOE, 2017).
B. Truck trips calculated assuming truck volume capacity of 15.33 CY per truck (23 tons per truck load, and 1.5 tons per in situ CY of soil). Values are rounded to the nearest 10.
C. As presented in Table 3-2, DOE's disposal volume assumes that 150,000 CY of the total 1,413,000 CY would be remediated by monitored natural attenuation.

Reclamation would consist of limited backfilling, grading, and revegetation as necessary. **Table 1-5** summarizes the estimated volumes of backfill that may be imported to the site.

TABLE 1-5
ESTIMATED BACKFILL SOIL VOLUMES

	Boeing [A]		DOE [B]		NASA [A]		Totals	
Source	Soil	*Trucks*	Soil	*Trucks*	Soil	*Trucks*	Soil	*Trucks*
Imported Backfill	128,700 [C]	*8,400*	947,250	*61,800*	290,000 [D]	*18,900*	**1,365,950**	***89,100***
Onsite Backfill	0[E]		0		0		**0**	***0***
Grand Total							**1,365,950**	***89,100***

NOTES: All soil volumes are in CY for in situ soils and are rounded to three significant digits.

A. Boeing and NASA estimate backfill volume to be approximately 1/3 of the total excavation volume (Areas I, II, III, and Southern Undeveloped Area) (NASA, 2014; MWH, 2015).
B. DOE estimates backfill volume to be approximately 75 percent of the total excavation volume (Area IV and Northern Undeveloped Areas). The additional backfill percentage compared to Boeing and NASA's areas is to account for deeper excavations required in DOE's areas of responsibility (DOE, 2017).
C. Boeing has identified potential offsite backfill sources from Santa Paula Materials Inc., Grimes Rock, Tapo Rock and Sand Inc., P.W. Gillibrand Company and Simi Valley Landfill (clean soils from landfill expansion) if approved by DTSC.
D. DTSC is working to ensure that DOE and NASA conduct a thorough survey of potential sources of backfill that meets AOC requirements.
E. Boeing has identified approximately 160,000 CY of soil from borrow areas in the Southern Undeveloped Area that may be available for backfill for Boeing projects if approved by DTSC. As a mitigation measure, onsite backfill would be utilized to the extent practicable (see Mitigation Measure TRANS-1 in Section 4.11, *Transportation and Traffic*, of this PEIR).

Groundwater and Unweathered Bedrock

The 2007 Consent Order requires the RPs to clean up contaminated groundwater at SSFL. While further investigation to examine the nature and extent of such contamination is ongoing, the existing data are robust and sufficient to demonstrate that new impacted groundwater plumes are unlikely to be identified. The cleanup requirements for most contaminants have been developed and will be presented in the future groundwater cleanup decision documents and may vary from

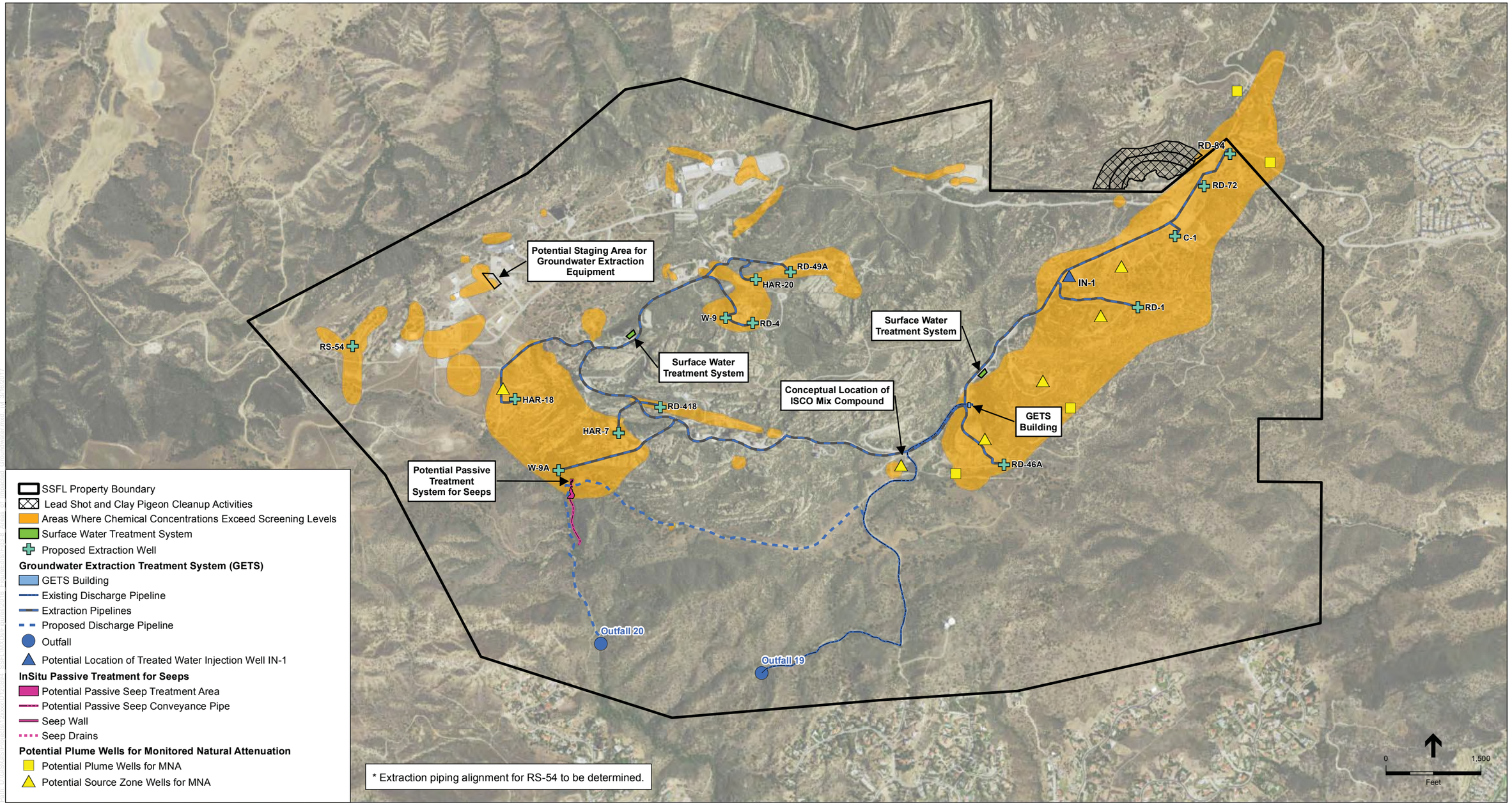
what is presented in the PEIR. Cleanup of groundwater includes consideration of remediation for contaminants in the unsaturated bedrock (vadose zone).

Identified areas of impacted groundwater requiring cleanup are shown in **Figure 1-6**. The primary contaminants to be treated include TCE and its degradation products,[2] 1,2,3-trichloropropane, n-nitrosodimethylamine, perchlorate, and 1,4-dioxane. Radionuclides (strontium-90 and tritium) have also been identified in some areas of impacted groundwater.

The cleanup methods in the following list are being considered for groundwater and/or vadose zone (unsaturated bedrock located just above groundwater) cleanup. A description of the proposed remediation techniques is presented in the following subsections. For all treatment methods requiring wells, existing wells would be used to the extent possible. When siting new wells, potential environmental impacts would be considered prior to siting (e.g., cultural and biological resources would be avoided to the extent feasible). Refer to Sections 3.6.3.1 through 3.6.3.7, of this PEIR, for a detailed description of each groundwater cleanup method listed below.

- **Groundwater Extraction and Treatment (Pump and Treat):** Extracting groundwater through pumping would be conducted to reduce higher concentrations of contaminants in former source zones and to supplement natural plume containment by manipulating hydraulic control in two areas of SSFL.
- **Thermal Enhanced Vapor Extraction:** Enhanced groundwater treatment involves the injection of one or more fluids into the subsurface using one or more injection wells. Types of enhanced treatment include:
  - In Situ Chemical Oxidation
  - In Situ Enhanced Biological Treatment
- **Air Sparging and Vapor Extraction:** Air sparging involves injecting air either into or beneath the groundwater table (creating bubbles) for the purpose of removing (sparging) VOCs from the groundwater. Air sparging is typically combined with SVE to capture and treat the VOCs sparged from the groundwater.
- **Monitored Natural Attenuation (MNA) and Institutional Controls:** MNA relies on natural physical, chemical, and biological processes to, over time, transform and degrade contaminant mass. This degradation process typically occurs through several steps that ultimately result in innocuous end products if complete transformation occurs.
- **Passive Treatment at Seeps:** Passive remediation technologies would be used either to treat impacted groundwater in situ prior to its emergence at the surface or to collect groundwater immediately below the ground surface with gravity conveyance for passive remediation through granulated activated carbon.

[2] Cis- and trans-1,2-dichloroethene, and vinyl chloride.



SOURCE: MWH 2014; Boeing 2014; ESA 2015

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Figure 1-6

Areas of Impacted Groundwater

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- **Bedrock Removal (for strontium-90):** Bedrock in the vicinity of the former leach field at the RMHF contains strontium-90 and is acting as continuing source of this radionuclide to groundwater. The bedrock source would be removed using a hydraulic breaker attached to an excavator. The hydraulic breaker would be capable of breaking the rock into removable pieces, and the excavator would be used to dig out the broken rock and place it into a sealed box to be transported to an approved offsite disposal facility.
- **Bedrock Vapor Extraction:** NASA has tested vapor extraction to remove VOCs from bedrock in the vicinity of the Bravo Skim Pond. Bedrock vapor extraction would be similar to SVE described previously, although the extraction wells and ancillary monitoring instruments would be drilled deeper into the unsaturated bedrock and screen depths would target factures and specific geologically transmissive strata.

Currently, the anticipated groundwater cleanup project consists of groundwater extraction and treatment, MNA, institutional controls, and passive treatment at seeps. In addition, as described in Section 3.6.4, *Decommissioning of Monitoring Wells and Former Water Supply Wells*, of this PEIR, the RPs propose to properly decommission former groundwater extraction wells located within each of their respective areas of responsibility.

Decommissioning of Monitoring Wells and Former Water Supply Wells

Monitoring wells and former water supply wells within the project site would be decommissioned in place by grouting with bentonite cement grout. Decommissioning of water supply wells would not affect current or future water supply at the project site because these wells are not used to supply water. Monitoring wells would be decommissioned as they reach their useful life span and are replaced with new monitoring wells or after groundwater cleanup and monitoring goals are met.

Several former water supply wells are still present at the site because they are part of the groundwater monitoring program or, in some cases, are used as extraction wells. Decommissioning of former water supply wells would occur where well locations are known and once there is no longer an anticipated use for monitoring or groundwater remediation. To date, this includes five wells in Area I, five in Area II, two in Area III, and one in Area IV, as shown in Figure 1-2. Use of a few former water supply wells for injection of treated groundwater is also being considered. The equipment required to decommission the water supply wells are described in Section 3.6.4 in Chapter 3.0, *Project Description*, of this PEIR.

Schedule, Workforce, and Equipment

Table 1-6 presents the activities, duration, and construction equipment needs for each of the methodologies described previously in this chapter. It is assumed that various activities addressed in the PEIR, including building removal and soil excavation and disposal activities would begin within approximately 30 days of DTSC's decision on the Final PEIR, and all of the activities would be completed in 10 to 15 years by a workforce of as many as 250 employees.

TABLE 1-6
CONSTRUCTION DETAILS FOR OVERALL SITE CLEANUP

Project	Activities	Duration	Construction Equipment
Soil			
Excavation and Disposal	Vegetation removal, grubbing, road improvements, excavation, stockpiling, truck loading/transport, backfilling, restoration	10 to 15 years	Dozers, loaders, excavators, scrapers, on-highway trucks specifically for hauling, vacuum trucks, compactors, a mobile centrifuge dewatering unit, water trucks, street sweepers, light-duty and support trucks
Soil Vapor Extraction	Install 150 extraction wells (10–35 feet deep), and associated piping/treatment system ,monitoring, well removal, restoration	3 years	Drill rigs, excavators, loaders, scrapers, trenchers, compactors, pavers, street sweepers, cement trucks, blower/vacuum, piping, light-duty and support trucks
Bio Treatment - Bioventing	Well installation/removal, monitoring, restoration	3 years	Well materials, drill rig, blower/vacuum, piping, light-duty and support trucks
Bio Treatment - Gaseous Electron Donor Injection	Similar to SVE and bioventing	3 years	Well materials, drill rig, blower/vacuum, piping, light-duty and support trucks
Bio Treatment - Ex Situ Biological Treatment	Clearing, grubbing, excavation, stockpiling, add water and chemical amendment, monitoring restoration	3 years	Dozers, loaders, excavators, scrapers, vacuum trucks, compactors, mobile centrifuge dewatering unit, water trucks, street sweepers, light-duty and support trucks
MNA (soil)	Soil monitoring	TBD [A]	Drill rig, light-duty and support trucks
Physical Remediation - Soil Solidification / Stabilization	Drill holes with augers to inject and mix reagent or excavate and process soil ex situ	TBD [A]	Excavators, loaders, pug mill, light-duty and support trucks
Physical Remediation - Thermal Desorption	Insert conductive wiring into media and apply electricity	TBD [A]	excavators, drill rigs, electric generators, light-duty and support trucks
Capping and Onsite Management	Place non-hazardous contaminated soils from Boeing Areas I and III (only)	TBD [A]	Excavators, loaders, scrapers, dozers, trucks for hauling, light-duty and support trucks
Lead Shot and Clay Pigeon Cleanup Activities			
Cleanup of Lead Shot and Clay Pigeons	Physically clean up lead shot and clay pigeon debris	5 years	Shovels, hand rakes, screens/sifters,, or backpack-mounted or truck-mounted vacuums; some localized excavation
Groundwater			
Groundwater Extraction & Treatment System	Install Outfall 020, drill or repurpose existing well for treated water injection, install wellhead treatment equipment, trenching and installation of piping	Minimum of 10 years	Drill rig, water truck, loader, excavator, loader compactor, haul truck, light-duty and support trucks
Enhanced Groundwater Treatment	Injection of chemicals or nutrients into groundwater, monitoring	Monitor for several years	Drill rigs, support trucks, light-duty and support trucks
Air Sparging and Vapor Extraction	Site-specific treatability study, install vapor extraction wells, monitoring	1 to 5 years	Drill rig, blower/vacuum, piping, well materials, backhoe, light-duty and support trucks

Project	Activities	Duration	Construction Equipment
MNA (Groundwater)	Monitoring	Ongoing [A]	Drill rigs, support trucks, light-duty and support trucks
Passive Treatment at Seeps	Access road modification, clearing and grubbing, soil and rock excavation, soil/rock stockpiling , transfer to trucks, placement of materials, recontouring, seeding and planting	Ongoing	Backhoes, excavators with hydraulic breakers, trucks specifically for hauling, vacuum trucks, compactors, water trucks, concrete trucks, light-duty and support trucks
Bedrock Removal for Strontium-90	Excavate bedrock, break bedrock, haul away and dispose of bedrock	6 to 12 months	Excavator, support vehicle, hydraulic breaker, dust suppression system, water truck, light-duty and support trucks
Bedrock Vapor Extraction	Install extraction wells, monitoring, well removal, restoration	1 to 5 years	Well materials, drill rig, blower/vacuum, piping, light-duty and support trucks
Decommissioning of Water Supply Wells	Overdrill wells, grout wells	6 months to 1 year	Drill rig, excavator, loader, trucks specifically for hauling, roller compactor, light-duty and support trucks

TBD = To be determined
A = Time frames for these durations noted as TBD will be carefully considered and limited as appropriate.

1.3.3.2 Initial Activities

The proposed project evaluates the estimated soil remediation volumes and areas of impacted groundwater, as well as the cleanup strategies and methodologies being considered to clean up the contaminated soil and water in a manner that would be consistent with the 2007 Consent Order and the 2010 AOCs. The proposed project presents several specific initial activities proposed by the RPs for approval, which would be implemented upon certification of this PEIR. The activities described in this section are for projects that have been developed in enough detail to be evaluated at a project level. It is important to note that these activities represent a portion of the cleanup activities described above and that additional projects would be developed by the RPs in future cleanup decision documents (as described in Sections 2.1, *Purpose of the PEIR*, and 2.4.4, *Approval Process for Future Documents*, of this PEIR) for approval by DTSC.

Site cleanup activities would be initiated after certification of this PEIR, approval of DTSC's Program Management Plan, and DTSC approval of the initial cleanup decision documents. It is anticipated that the approval of the initial cleanup decision documents would occur after certification of this PEIR.

Figure 1-7 shows an overview of the proposed initial activities. The estimates presented in this PEIR reflect a greatest degree of impact scenario, as the requirements of the cleanup decision documents would reflect refinements in the project design that would result in reductions or no changes to the overall scale of the project.

DOE's initial project (Section 3.7.1) is the cleanup of approximately 3,000 in situ CY of soil within Area IV that contains radionuclides above the draft Provisional Radiological LUT values, and approximately 88,000 in situ CY of radionuclide and chemical contaminated soil.

NASA's initial project (Section 3.7.2) is the cleanup of approximately 73,500 in situ CY of soils at the former Liquid Oxygen Plant in the NASA managed portion of Area I.

Activities related to demolition of buildings in Area IV are described in Section 3.7.3.

Activities related to the renewal of two post-closure permits and closure of three former hazardous waste management facilities, all of which are currently non-operational, under the RCRA Hazardous Waste Facility Permitting Program are described in Section 3.7.4.

Cleanup activities associated with the projects listed above would commence after certification of the Final PEIR and associated cleanup decision documents and activities would occur for approximately 15 months, and would consist primarily of soil excavation and offsite disposal of soil and demolition. Monitoring and maintenance would likely continue beyond the foreseeable future. This predicted variability is based on factors such as scheduling, the complexity of various projects stages (e.g., building removal, excavation, backfilling, confirmation sampling), coordination between the RPs, determination of final soil excavation volumes, and project initiation and ability to ramp up.

1.4 Summary of Project Alternatives

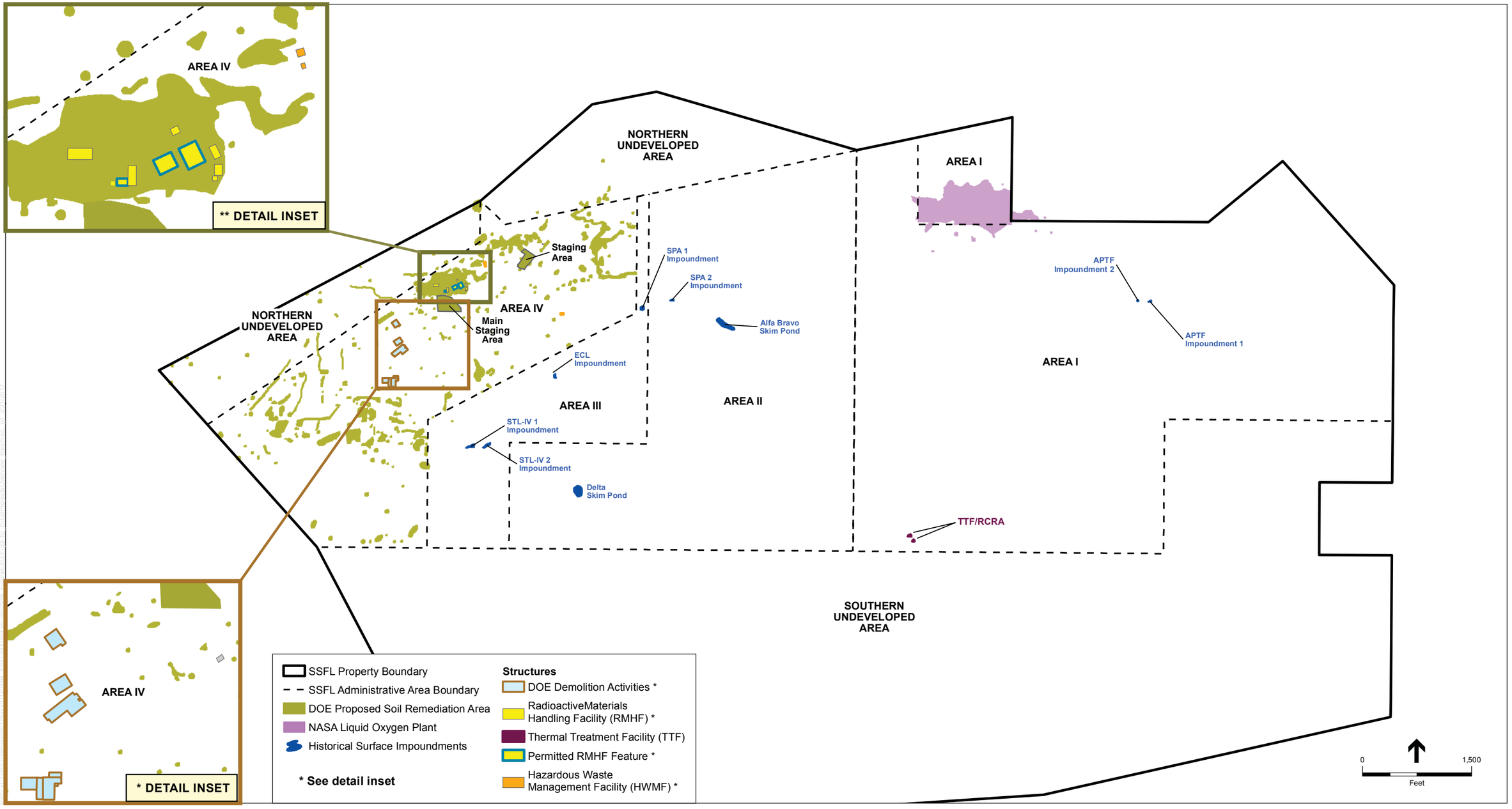
1.4.1 Alternative 1 – No Project Alternative

The No Project Alternative represents a continuation of the existing conditions at the project site. Under this alternative, no further action would be taken to treat or remove the impacted onsite soils and groundwater beyond current monitoring and maintenance activities. Operation of the existing GETS would continue under this alternative. All other existing site features would remain.

The No Project Alternative is required pursuant to Section 15126.6(e)(2) of the CEQA Guidelines, which states that the No Project Alternative shall:

"…discuss the existing conditions at the time the notice of preparation is published, or if no notice of preparation is published, or if no notice of preparation is published, at the time the environmental analysis is commenced, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services."

The existing conditions at the time the NOP (November 22, 2013) included ongoing investigation and monitoring of soil and groundwater contamination, demolition of some NASA-owned structures, and operation of surface and groundwater treatment systems (see Section 3.4, *Environmental Setting*, of this PEIR).



SOURCE: NASA 2016; ESA 2015

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Figure 1-7

Initial Projects Overview

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1.4.2 Alternative 2: AOC Exceptions Alternative

As discussed in Section 3.3.1, *Soils*, of this PEIR, both the 2007 Consent Order and 2010 AOCs state that actions taken pursuant to the orders must be conducted in accordance with local, state, and federal laws, including laws and regulations related to protecting biological resources (habitat or species protected under the federal and California Endangered Species Acts) or cultural resources (e.g., Native American artifacts). Alternative 2 would implement exceptions to the cleanup standards established in the AOCs for areas that contain significant cultural or biological resources. AOC exceptions would also be applied to ensure compliance with the National Historic Preservation Act, Endangered Species Act, California Endangered Species Act, Clean Water Act, California streambed alteration requirements, local biological protection regulations, and the California Porter-Cologne Water Quality Control Act. All other components would remain the same as the project.

1.4.3 Alternative 3: Reduced Truck Trip Scenario

This alternative would limit the maximum number of daily haul truck trips associated with the project to 48 round trips per day, which is half of the daily maximum defined for the proposed project (i.e., 96 round trips per day). Limiting the maximum number of daily haul truck trips under this alternative would extend the construction schedule by 6 years. All other components would remain the same as under the project.

1.4.4 Alternative 4: Conveyor Transport

Based on the results of the Transportation Feasibility Analysis (see Appendix J), two alternative transportation options have been selected for analysis. These options include Alternative 4a-Edison Road Conveyor Route and Alternative 4b-North American Cutoff Road Conveyor Route.

As discussed in Appendix J, if one of these alternatives were selected for approval and implementation, it is assumed that excavation and disposal would begin as proposed under the proposed project (i.e., trucks would use the transportation routes identified for the proposed project), while the selected alternative is permitted and constructed (which would take approximately 4 years). Therefore, this analysis assumes that the project (use of trucks to carry soil from the site) would be implemented for approximately 4 years before Alternative 4a or 4b would begin operation. Once Alternative 4a or 4b was operational, truck trips associated with removal of soil would be reduced, and backfill would continue to be transported in trucks.

Therefore, this analysis assumes that the proposed project would be implemented for approximately 4 years before the selected alternative (4a or 4b) would begin operation. As such, impacts of the proposed project identified in Chapter 4.0, *Environmental Setting, Impacts and Mitigation*, of this PEIR would occur for approximately 4 years and the impacts evaluated below would occur upon operation of the selected alternative, i.e. after 4 years of operation of the proposed project.

1.4.4.1 Alternative 4a: Edison Road Overland Conveyor to Truck Route

This alternative consists of constructing an overland conveyor along Edison Road to transport soil from the project site to a truck-loading site in Simi Valley for transport by truck to disposal facilities via Tapo Canyon Boulevard to SR 118. The truck-loading site would be located near the intersection of Guardian Street and Tapo Canyon Road. The conveyor system would be 2.6 miles long. This alternative would require disturbance of approximately 11,400 square feet of land area. Details about the Edison Road Conveyor Route are presented in the Transportation Feasibility Analysis provided in Appendix J. The conveyor system would follow Edison Road, a private road, as much as possible and would not fully occupy the road right-of-way or prohibit access. Edison Road would remain available to SCE for inspection and maintenance of an existing transmission line along the roadway. The road would also be used as an access road for conveyor maintenance. Under this alternative all activities associated with the proposed project would be implemented as described in Chapter 3.0, *Project Description*, of this PEIR. However, after the conveyor becomes operational (approximately 4 years after project initiation) the use of Woolsey Canyon Road as a primary route for trucks would be avoided, as trucks hauling material to disposal sites would travel to the freeway network from the intersection of Tapo Canyon Road and Guardian Street to SR 118, although backfill soil and other equipment and supplies would still be transported to the project site via truck on Woolsey Canyon Road.

1.4.4.2 Alternative 4b: North American Cutoff Road Overland Conveyor to Rail Route

This alternative consists of constructing an overland conveyor along North American Cutoff Road to transport soil from the project site to a new rail-car loading facility in Simi Valley for transport by rail to disposal sites. The rail site is located near the east end of Smith Road. The conveyor system would be 3.1 miles-long and require the disturbance of approximately 20,400 square feet of land area. Details about the North American Cutoff overland conveyor are included in the Transportation Feasibility Analysis provided in Appendix J. Under this alternative all activities associated with the proposed project would be implemented as described in Chapter 3.0, *Project Description*, of this PEIR. However, after the conveyor becomes operational (approximately 4 years after project initiation) the use of haul trucks to transport contaminated soil would be eliminated, although backfill soil and other equipment and supplies would still be transported to the project site via truck on Woolsey Canyon Road.

1.5 Summary of Known Controversial Issues

CEQA Guidelines require that the summary of an EIR include a synopsis of known issues of controversy that have been raised by agencies and the public (CEQA Guidelines, Section 15123). A Notice of Preparation (NOP) for the project was released on November 22, 2013, and is included in this PEIR as Appendix C. The NOP and the scoping process are described in Chapter 2.0, *Introduction*, of this PEIR. Agency and public scoping meetings were held on December 10, 2013, and December 14, 2013, to receive oral comments on the scope and content

of the Draft PEIR. **Table 1-7** gives a summary of known controversial issues that have been identified regarding the project.

The table summarizes the key potential environmental issues raised in response to the NOP and during the PEIR public scoping process. The topics raised are summarized in the table based on the section of the PEIR in which the comment is addressed. Refer to Appendix C for more information about scoping comments, including a detailed scoping comment matrix and a copy of all public scoping comments received.

TABLE 1-7
TOPICS RAISED DURING THE PUBLIC SCOPING PROCESS

Issue Area	Public Scoping Topics Raised
Project Description	• Include cleanup schedule • Number of trucks • Quantify soil disturbance • Desire risk-based cleanup • Desire cleanup to background levels
Air Quality	• Health effects of diesel emissions • Air District significance thresholds • Cumulative impacts of all three RPs • Efforts must be made to minimize and contain dust • Evaluate risk of Valley Fever • Consider greenhouse gas emissions from trucks • Wind-blown contaminants poses risks to health
Biological Resources	• Conduct protocol surveys for sensitive species • Conduct preconstruction surveys • Evaluate impacts to oak trees • Consider impacts to wildlife migration corridor • Evaluate locally important species (Ventura County) • Impacts to native birds • Invasive species • Impacts to Santa Susana tarplant • Excavation will eliminate native seed bank
Cultural Resources	• Evaluate impacts to Traditional Cultural Property • Include description of consultation with Native American Tribes • Impacts to historic structures • DTSC must consider the whole site as Sacred Land • Require archaeological and Native American monitoring during building demolition • Burro flats is a significant cultural resource • Native American use of the site dates back at least 5,000-7,000 years • Cultural resources should be addresses

Issue Area	Public Scoping Topics Raised
Hazards	• Health risk assessment for sensitive groups • Consider background levels outlined in the AOCs • Noticing onsite of remaining contaminants • Wind-blown contaminants health risks • Characterization of contaminants onsite • Identification of location of clean fill material • Handling plan of wet and dry materials; including hazardous and non-hazardous • Containment of hazardous materials and potential contamination of equipment that would leave the project site
Hydrology and Water Quality	• Groundwater flows • Impacts of groundwater remediation on watershed • Impacts of groundwater extraction on biological resources • Remediation impacts on drinking water quality • Evaluate groundwater contaminant cleanup levels • Renewal of National Pollutants Discharge Elimination System permit • Consider remediation impacts to surface and groundwater • Analysis of best management practices • Analysis of surface water runoff and flooding
Noise	• Increased noise levels impact to residents due to soil hauling • Consider start and end times for soil hauling • Consider hauling equipment and noise levels • Noise mitigation measures
Transportation	• Traffic impact analysis and traffic plan • Risk of spills of contaminated soil from traffic accidents • Traffic congestion • Truck traffic will effect emergency services • Pedestrian safety and safety measures • Impacts to roads; consider who is responsible for security and maintenance • Analysis of alternatives modes of transportation including rail • Parking and staging areas • Haul routes • Conflicts with local city plans • Analysis of truck volumes • Transportation-related mitigation measures • Consider distances of disposal sites • Impacts to highways
Utilities	• Destination of impacted soil • Cumulative impacts regarding disposing of contamination soils • Consider recycling of non-hazardous material • Consider use of existing infrastructure where feasible • Environmental Justice evaluation for destinations of hauled materials • Impacts to disposal facilities
Alternatives Chapter	• Evaluate viable alternatives only • Alternatives proposed must meet the remedial objectives of the 2010 AOCs • Consider hauling and transportation options • Consider remediation onsite versus hauling offsite

1.6 Issues to Be Resolved

DTSC has prepared this PEIR using available technical information regarding potential alternatives to the project that would avoid or reduce significant environmental effects associated with soil and groundwater remediation activities at the SSFL. As required by CEQA, DTSC must evaluate the information in this PEIR, including the identified mitigation measures and potentially feasible alternatives, before deciding whether to approve the project or an alternative to the project. At this time, the issues presented in the table above are the only identified issues to be resolved regarding the selection of alternatives or regarding implementation of the project.

1.7 Summary of Impacts and Mitigation

Information in **Table 1-8** has been organized to correspond with the environmental issues discussed in Chapter 4.0, *Environmental Setting, Impacts and Mitigation,* of this PEIR.

TABLE 1-8
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
4.1 Aesthetics			
IMPACT 4.1-1a: Would implementation of the overall site cleanup have a substantial adverse effect on a scenic vista?	Potentially Significant	Implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5.	Less than Significant
IMPACT 4.1-1b: Would implementation of the initial have a substantial adverse effect on a scenic vista?	Potentially Significant	Implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5.	Less than Significant
IMPACT 4.1-2a: Would implementation of the overall site cleanup substantially damage scenic resources, including, but not limited to, trees, rock outcropdings, and historic buildings within a state scenic highway?	Less than Significant	No mitigation is required.	N/A
IMPACT 4.1-2a: Would implementation of the initial activities substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	Less than Significant	No mitigation is required.	N/A
IMPACT 4.1-3a: Would the overall site cleanup substantially degrade the existing visual or community character or quality of the site and its surroundings?	Potentially Significant	Implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5.	Less than Significant
IMPACT 4.1-3b: Would the initial activities substantially degrade the existing visual or community character or quality of the site and its surroundings?	Potentially Significant	Implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5.	Less than Significant
IMPACT 4.1-4a: Would the overall site cleanup create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area?	Less than Significant	No mitigation is required.	N/A
IMPACT 4.1-4b: Would the initial activities create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area?	Less than Significant	No mitigation is required.	N/A
4.2 Air Quality			
IMPACT 4.2-1a: Would implementation of the overall site cleanup result in conflicts with or obstruction of implementation of the applicable air quality plans?	Potentially Significant	Implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 though GHG-3, and HAZ-2. **Mitigation Measure AQ-1:** Tier 4 Rated Engines. All onsite equipment greater than 50 hp would be required to use Tier 4 final rated engines or have emissions levels equivalent to that of Tier 4 final rated engines (Engines that are not Tier 4 but have been retrofitted with catalytic converters and/or diesel particulate filters, such that the emissions reductions of Tier 4 engines are met). **Mitigation Measure AQ-2:** Perimeter Air Monitoring Plan. The RPs, under the direction of DTSC, shall implement a perimeter air monitoring plan (AMP). The AMP includes	Significant and Unavoidable

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		real-time perimeter air monitoring for odors, dust, and volatile chemicals, as well as more limited time-integrated sampling for volatile chemicals and dust at the locations and frequencies outlined in the AMP, which shall be approved by DTSC. During the excavation activities, water or a similar suppressant (e.g., Soil Seal), will be applied as necessary to suppress potential dust, odors, and emissions, including volatiles. The AMP shall include action standards with corresponding actions if/when action standards are exceeded. Such actions could include additional water, the use of foam or soil binding agents, tarps, or the cessation of activities. Air monitoring logs shall be maintained onsite at all times per the AMP. A log containing dates on which action standards are triggered and response shall be maintained onsite. These logs shall be made available to DTSC and VCAPCD for inspection upon request. **Mitigation Measure AQ-3:** Fugitive Dust Control. The RPs, under the direction of DTSC, shall monitor and control fugitive dust emissions by measures prescribed by VCAPCD Rule 55 and documented in an approved Soil Management Plan (see Mitigation Measure AQ-4). The RPs, under the direction of DTSC, shall work with both the VCAPCD and LARWQCB to approve the various aspects of the Soil Management Plan that may fall under multiple jurisdictions. At a minimum, the following measures shall be used to reduce both onsite and offsite fugitive dust emissions: • To prevent wind-driven dust during operations, water spray/mists or similar suppressant (e.g., Soil Seal) shall be used during bulk material handling, earth-moving, construction and demolition activities, and vehicle movement on unpaved roads. Application of water dust suppressant shall occur at least 4 times per day on active areas of disturbance and unpaved roads. Application of a long-term soil suppressant (e.g., SoilSeal) shall be used for areas of disturbance that are inactive for more than five days. • To prevent wind-driven dust at storage piles, inactive storage piles shall be covered with anchored plastic sheeting and use water spray/mists at active storage piles. • To prevent soil from being tracked away from the work area, outbound trucks exporting bulk material shall remain on paved roads to the extent practicable, and if travel on unpaved roads is required, rumble strips (wheel shaking device to remove bulk material from tires and undercarriage) shall be placed at the location where the unpaved road joins paved roads. To minimize dust on unpaved roads at the site, limit speed to 15 miles per hour or less. • To control dust emissions from outbound trucks, the entire surface area of outbound truck loads shall be covered with secured tarps or a container-type enclosure shall be used. • To avoid fugitive dust during high wind conditions, soil disturbance activities shall be ceased, if onsite wind speeds exceeding 25 miles per hour for at least 5 minutes in an hour.	

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		• To ensure that any visible dust emissions are controlled, an observer certified by the CARB or the USEPA shall periodically perform opacity assessments. **Mitigation Measure AQ-4:** Soil Management Plan. The RPs, under the direction of DTSC, shall prepare a plan for the management of soil that contains gasoline, diesel fuel, jet fuel, or other known ROC. These soils shall be monitored and controlled by measures prescribed by VCAPCD Rule 74.29 and documented in a DTSC-approved Soil Management Plan. In addition to the fuels identified by Rule 74.29, the Soil Management Plan shall provide dust suppression for any active or inactive stockpile that is known or suspected to contain known ROC contaminants. The measures that shall be used include the following: • To minimize emissions of ROCs to the atmosphere, active and inactive excavations and stockpiles of soil that contain gasoline, diesel fuel, jet fuel, or other known ROC contaminants, and emit ROCs in excess of 50 ppmv above background, specifically as hexane, except non-repeatable momentary readings, shall be kept visibly moist by water spray, treated with a vapor suppressant, or covered with a continuous heavy-duty plastic sheeting (4 mil or greater) or other covering. The covering shall be overlapped at the seams and securely anchored to minimize headspace where vapors could accumulate. • Monitoring of ROC emissions from soil stockpiles shall be performed as specified in VCAPCD Rule 74.29. **Mitigation Measure AQ-5:** Prohibit Idling. The RPs, under the guidance of DTSC, shall prohibit the idling of on-road and off-road heavy-duty diesel vehicles for more than 5 minutes at a time. This measure is consistent with California regulations and laws as well as CARB Air Toxics Control Measure requirements.	
IMPACT 4.2-1b: Would implementation of the initial activities result in conflicts with or obstruction of implementation of the applicable air quality plans?	Potentially Significant	Implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, and HAZ-2.	Significant and Unavoidable

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
IMPACT 4.2-2a: Would implementation of the overall site cleanup result in violation of air quality standards or contribute substantially to existing or projected air quality violations?	Potentially Significant	Implementation of Mitigation Measures AQ-1 through AQ-6, BIO-5, GHG-1 through GHG-3, HAZ-2, and TRANS-1. **Mitigation Measure AQ-6:** Valley Fever. During heavy grading where the top 12 to 18 inches of soil would be disturbed, construction contractors shall comply with the following measures, as feasible to reduce potential Valley Fever impacts (VCAPCD, 2003): • Restrict employment for grading activities to persons with positive coccidioidin skin tests (since those with positive tests can be considered immune to reinfection). • Hire crews from local populations where possible, since it is more likely that they have been previously exposed to the fungus and are therefore immune. • Require crews to use respirators during project clearing, grading, and excavation operations in accordance with California Division of Occupational Safety and Health regulations. • Require that the cabs of grading and construction equipment to be air-conditioned or enclosed with sufficient ventilation and particulate matter filtration systems. • Require crews to work upwind from excavation sites where possible. • Where acceptable to the fire department, control weed growth by mowing instead of disking, thereby leaving the ground undisturbed and with a mulch covering. • During rough grading and construction, the access way into the project site from adjoining paved roadways should be paved or treated with environmentally-safe dust control agents.	Significant and Unavoidable
IMPACT 4.2-2b: Would implementation of the initial activities result in violation of air quality standards or contribute substantially to existing or projected air quality violations?	Potentially Significant	Implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, HAZ-2, and TRANS-1.	Significant and Unavoidable
IMPACT 4.2-3a: Would the overall site cleanup expose sensitive receptors to substantial pollutant concentrations of CO, NOx, PM_{10}, $PM_{2.5}$, and TACs?	Less than Significant	No mitigation is required.	N/A
IMPACT 4.2-3b: Would the initial activities expose sensitive receptors to substantial pollutant concentrations of CO, NOx, PM_{10}, $PM_{2.5}$, and TACs?	Less than Significant	No mitigation is required.	N/A

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
IMPACT 4.2-4a: Would the overall site cleanup result in a cumulatively considerable net increase of any criteria pollutant for which the region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	Potentially Significant	Implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, HAZ-2, and TRANS-1.	Significant and Unavoidable
IMPACT 4.2-4b: Would the initial activities result in a cumulatively considerable net increase of any criteria pollutant for which the region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	Potentially Significant	Implementation of Mitigation Measures AQ-1, AQ-2, BIO-5, GHG-1 through GHG-3, HAZ-2, and TRANS-1.	Significant and Unavoidable
IMPACT 4.2-5a: Would the overall site cleanup create objectionable odors affecting a substantial number of people?	Less than Significant	No mitigation is required.	N/A
IMPACT 4.2-5b: Would the initial activities create objectionable odors affecting a substantial number of people?	Less than Significant	No mitigation is required.	N/A
IMPACT 4.2-6a: Would the overall site cleanup trigger the release and propagation of spores from Coccidioides immiti, a fungus known for causing Valley Fever?	Potentially Significant	Implementation of Mitigation Measure AQ-6.	Less than Significant
IMPACT 4.2-6b: Would the initial activities trigger the release and propagation of spores from Coccidioides immiti, a fungus known for causing Valley Fever?	Potentially Significant	Implementation of Mitigation Measure AQ-6.	Less than Significant
4.3 Biological Resources			
IMPACT 4.3-1a: Would implementation of the overall site cleanup have a substantial adverse effect either directly or through habitat modification on Braunton's milk-vetch or its designated critical habitat**?**	Potentially Significant	Implementation of Mitigation Measures BIO-1 through BIO-4. **Mitigation Measure BIO-1:** Critical Habitat and Listed Species Avoidance. Remediation activities in critical habitat or containing state and federally listed species shall be minimized to the extent practicable and consistent with applicable laws. A USFWS and CDFW-approved biologist shall be onsite to monitor any ground-disturbing activities within critical habitat or occupied habitat for listed species. For areas where an AOC exception is applied and critical habitat or habitat for listed species are avoided, the following mitigation shall be required: • Federal- and state-listed plant species and critical habitat shall be flagged for avoidance within and near work zones and suitable no-disturbance buffer established. The appropriate buffer distance shall be determined by the USFWS-approved biologist and the avoidance area shall be periodically monitored. • If a federal- or state-listed animal species is identified during work activities, work shall halt until the biologist determines appropriate actions to avoid and	Significant and Unavoidable

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		minimize harm to the species. Federally-listed wildlife species shall not be handled or relocated without first obtaining take authorization from USFWS and/or CDFW. USFWS and/or CDFW shall be consulted to determine an appropriate response. State-listed wildlife species shall not be pursued, handled, relocated, or killed without first providing information about the activity to CDFW to its satisfaction so that it may assess the impact on the state-listed wildlife. Any conditions that CDFW requires after assessing the information shall be implemented when conducting the work activities and such conditions may include avoidance, minimization, and mitigation measures, and applying for and receiving an incidental take permit. If an AOC exception is not applied, and where remedial activity is required in critical habitat or habitat for listed species, the following mitigation is required: • USFWS and CDFW shall be consulted prior to the start of any work activities within critical habitat, occupied habitat, or disturbance or removal of a listed plant species. • Work zones shall be monitored for the presence of listed species prior to and periodically during work activities by a CDFW-approved biologist or botanist. • If a federal-listed animal species is identified during work activities, work shall halt until the biologist determines appropriate actions to avoid and minimize harm to the species. Federal-listed wildlife species shall not be handled or relocated without first obtaining take authorization from USFWS. USFWS shall be consulted to determine an appropriate response. • State-listed wildlife species shall not be pursued, handled, relocated, or killed without first providing information about the activity to CDFW to its satisfaction, so that it may assess the impact on state-listed wildlife. Any conditions that CDFW requires after assessing the information shall be implemented when conducting the work activities and such conditions may include avoidance/minimization measures, applying for and receiving an incidental take permit, as well as implementing requirements of the incidental take permit. **Mitigation Measure BIO-2:** Worker Environmental Awareness Program Training. Prior to the start of construction, the RPs, under the direction of DTSC, shall retain a USFWS and CDFW-approved biologist to provide Worker Environmental Awareness Program (WEAP) Training to all construction workers onsite. The training shall include materials to aid workers in identifying sensitive habitats, plants, and wildlife that should be avoided; applicable laws and regulations protecting such resources; and proper avoidance and communication procedures to protect sensitive biological resources, as well as common wildlife whenever possible. **Mitigation Measure BIO-3:** Braunton's Milk-Vetch. Prior to vegetation or ground	

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		disturbance within areas affected by cleanup activities and suitable habitat where Braunton's milk-vetch have not been previously documented, focused surveys for Braunton's milk-vetch shall be conducted by a USFWS and CDFW-approved botanist/biologist, retained by the RPs, under the direction of DTSC. The focused surveys shall be conducted within 1 year prior to vegetation or ground disturbance and during the appropriate blooming period (January through August). During the focused surveys, individual plants detected shall be flagged by the botanist/biologist, and these areas of occupied habitat shall be considered for an AOC exception. For areas where the AOC exception is applied and Braunton's milk-vetch plants and critical habitat are avoided, the following mitigation is required: • Prior to vegetation or ground disturbance, a USFWS-approved botanist/biologist shall delineate critical habitat and Braunton's milk-vetch occupied habitat for avoidance. If an AOC exception is not applied, and where remedial activity would result in disturbance or removal of Braunton's milk-vetch plants or its critical habitat, the following mitigation is required: • Prior to vegetation or ground disturbance to Braunton's milk-vetch occupied habitat or critical habitat, a conservation plan shall be developed in consultation with USFWS and CDFW to protect this species, which shall identify effective conservation strategies that may include erecting fencing to prevent herbivory effects and insect pollinator habitat requirements. Recovery criteria for Braunton's milk-vetch identified in the *Recovery Plan for Six Plants from the Mountains Surrounding the Los Angeles Basin* (1999) shall be considered and included, as appropriate, in the preparation of the conservation plan, in consultation with USFWS. • During vegetation or ground disturbance associated with remediation activities, clean topsoil shall be salvaged for reuse as appropriate and approved biological monitor shall be onsite to make sure work is conducted within areas of occupied/critical habitat previously authorized by USFWS through its Biological Opinion. • Conservation measures and biological reporting related to Braunton's milk-vetch as identified in the USFWS's Biological Opinion for the proposed remediation activities shall be implemented. **Mitigation Measure BIO-4:** Weed Management Plan. Prior to any ground disturbing activities, the RPs under the direction of DTSC, shall prepare a Weed Management Plan for CDFW approval to prevent introduction of noxious and invasive species onsite, confirm and document that construction equipment is visually free of weeds and soil prior to bringing onsite, confirm backfill is free of invasive plant species, and ensure revegetation seed mixtures are free of noxious or invasive species.	

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
IMPACT 4.3-1b: Would implementation of the initial activities have a substantial adverse effect either directly or through habitat modification on Braunton's milk-vetch or its designated critical habitat**?**	Potentially Significant	Implementation of Mitigation Measures BIO-1 through BIO-4.	Significant and Unavoidable
IMPACT 4.3-2a: Would implementation of the overall site cleanup have a substantial adverse effect either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS?	Potentially Significant	Implementation of Mitigation Measure BIO-1, BIO-2, and BIO-4 through BIO-18. **Mitigation Measure BIO-5:** Revegetation Plan. Prior to any ground disturbances, a site-specific revegetation plan shall be prepared by a qualified restoration ecologist, retained by the RPs and approved by CDFW, that includes a description of existing conditions for each area, disturbances, compensation mitigation, site preparation, revegetation methods, maintenance and monitoring criteria, performance standards, and adaptive management practices. Appropriate restoration measures shall be prescribed based on site location, slope, and remoteness. The plan shall identify cover standards that shall be developed for each plant community target, and cover values established for each layer (i.e., herb, shrub, and/or tree layers). The plan shall identify the quantity and quality of habitats to be restored onsite; distinguish micro-habitat requirements for specific native habitats to be restored including soil, moisture, nutrient and pH requirements, and topographic requirements such as aspect and slope; and identify micro-habitat requirements for sensitive wildlife species (i.e., woody material). The amount and extent of habitat revegetation shall be identified in the revegetation plan and shall be determined based on habitat quality and through coordination with CDFW prior to the initiation of any ground disturbance. Restoration shall incorporate the use of a native seed mix approved by CDFW, and soil stabilization BMPs shall be incorporated to help in the reseeding success, including soil binders, erosion mats, and erosion control check dams, which shall be used in accordance with the Stormwater Pollution Prevention Plan. The plan shall require that any large boulders removed during cleanup be replaced in a similar layout as existing conditions to retain the natural character of the area. Appropriate restoration measures, goals, and monitoring requirements shall be included in the plan based on site location, slope, and remoteness, and shall be specified on all CDFW-approved construction plans. The revegetation plan shall require that clean, topsoil be stored for revegetation purposes; however, large stockpiles of clean topsoil shall be discouraged as this can negatively impact favorable soil properties, such as, but not limited to a reduction of organic matter (e.g., erosion, leaching, decomposition, dilution through soil horizon mixing), microbial biomass, bulk density, water holding capacity, and viable seed populations. The revegetation plan shall identify reseeding techniques that are appropriate for specific locations within the SSFL site, such as reseeding by drilling, broadcast, or hydro seeding techniques, and shall specify any soil amendments that may be needed based on the soil composition, including pH and nutrient content. The plan shall identify the timing of initial seed application following soil and slope stabilization activities, followed by a secondary application prior to the onset of winter rains, and the plan shall require that	Significant and Unavoidable

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		reseeding consist of seed collected from the SSFL site and/or immediate area. Lastly, the revegetation plan must include the proposed timetable for implementing the restoration, including, site preparation, establishment of diverse plant species, maintenance, and additional enhancement to establish the restoration, including adaptive management strategies. It shall identify performance standards and long-term maintenance and management needs of the restoration, responsible parties, and funding mechanism. **Mitigation Measure BIO-6:** Special-Status Plants. Focused surveys for special-status vascular plants and non-vascular plants (i.e., moss and bryophytes) shall be conducted by a USFWS and CDFW-approved botanist/biologist, retained by the RPs, under direction of DTSC, prior to ground disturbance within suitable habitat affected by soil remediation activities. The following special-status plant species would potentially be affected: Malibu baccharis, Catalina mariposa lily, slender mariposa lily, Plummer's mariposa lily, western spleenwort, Brewer's calandrinia, round-leaved filaree, club-haired mariposa lily, late-flowered mariposa lily, Peirson's morning-glory, Lewis' evening-primrose, Island mountain-mahogany, San Fernando Valley spineflower, Parry's spineflower, small-flowered morning-glory, crowned forget-me-not, Norris' beard moss, slender-horned spineflower, trask yerba santa, Palmer's grapplinghook, vernal barley, mesa horkelia, decumbent goldenbush, tiny poppy, white-veined monardella, Ojai navarretia, chaparral nolina, Lyon's pentachaeta, hubby's phacelia, south coast branching phacelia, California screw moss, and Ventura County Locally Important Plants. The focused surveys shall be consistent with CDFW 2009 protocols, and conducted within 3 years prior to initial vegetation or ground disturbance during the appropriate blooming periods. Focused plant surveys shall not be required if valid plant surveys have been conducted within suitable habitat for these species and were completed within 3 years of initial vegetation or ground disturbance. During the focused surveys, individual special-status plants that are detected shall be marked or flagged for avoidance to the extent feasible. If it is anticipated that individual plants cannot be avoided, coordination with CDFW shall occur prior to disturbance to determine if species-specific mitigation is necessary. Depending on the sensitivity of the species, relocation, seed collection, habitat restoration (i.e., revegetation of suitable habitat), or other habitat improvement actions shall be identified in communication with CDFW to mitigate for unavoidable impacts. In addition, during vegetation or ground disturbance associated with remediation activities, a CDFW-approved biological monitor shall be onsite to establish avoidance areas and track any impacts to individual special-status plants. **Mitigation Measure BIO-7:** Santa Susana Tarplant. Prior to ground disturbance, focused surveys for Santa Susana tarplant shall be conducted by a CDFW-approved botanist/biologist, retained by the RPs under the direction of DTSC, within suitable habitat affected by soil remediation activities. The focused surveys shall be conducted within 3 years prior to initial vegetation or ground disturbance and during the appropriate blooming period. Focused plant surveys shall not be required if valid plant surveys have	

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		been conducted within suitable habitat for this species and were completed within 3 years of initial vegetation or ground disturbance. During the focused surveys, individual plants detected shall be marked or flagged for avoidance to the extent feasible, and a suitable no-disturbance buffer established. The appropriate buffer distance shall be determined by the CDFW-approved botanist/biologist. For areas where an AOC exception is applied and Santa Susana tarplants are avoided, the following mitigation shall be required. • Prior to vegetation or ground disturbance, a CDFW-approved botanist/biologist shall delineate Santa Susana tarplant occupied habitat for avoidance. If an AOC exception is not applied, and where remedial activity would result in disturbance or removal of Santa Susana tarplants, the following mitigation is required: • Prior to conducting any remedial activities, information about the remedial activity shall be provided to CDFW to its satisfaction so that it may assess the impact on the Santa Susana tarplant. Any conditions that CDFW requires after assessing the information shall be implemented when conducting the remedial activity and such conditions may include avoidance, minimization, and mitigation measures, and applying for and receiving an incidental take permit. • A CDFW-approved biologist shall determine the number of individual Santa Susana tarplants that would be impacted prior to and ground-disturbance activities. • Prior to vegetation or ground disturbance to Santa Susana tarplant occupied habitat, a draft Santa Susana Tarplant Restoration Plan shall be prepared and submitted to CDFW for review and approval prior to any vegetation or ground disturbance. The plan shall entail the following, but not be limited to: - Identification of the number of individual tarplants that were observed during the most-recent focused plant survey prior to impacts. - Identification of proposed enhancement areas through habitat characterization. - Methods for restoring tarplant habitat to pre-project conditions to the greatest extent feasible, and to create conditions suitable for establishment of Santa Susana tarplant and other onsite local native species. - Methods to restore habitat elements for insect pollinators such as retaining woody debris, brush piles with various dimensions of wood, rocks and cobble of various sizes. - Tarplant seeds shall be collected onsite to be successfully re-introduced into onsite restored habitat areas (i.e., backfilled areas)	

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation

as well as local areas where seeds are gathered and used near the impact areas.

- RPs and funding mechanism.
- Performance standards and success criteria for measuring and determining establishment of tarplant individuals. Plant establishment shall be based on CDFW- qualitative and quantitative survey methods, details of which shall be specified in the restoration plan.
- Five-year monitoring and reporting methods.
- Maintenance requirements.
- Weed control and maximum weed cover allowance.

- During vegetation or ground disturbance associated with remediation activities, a CDFW-approved biological monitor shall be onsite to establish avoidance areas and track any impacts to individual plants. The actual number of individual plants removed shall be documented in the final restoration plan for approval by CDFW prior to implementation.

Mitigation Measure BIO-8: Vernal Pool Branchiopods. For areas where an AOC exception is applied and vernal pools are avoided, no further mitigation is required.

If an AOC exception is not applied and vernal pool habitat is unavoidable, prior to any ground disturbance, a USFWS and CDFW-approved biologist, retained by the RPs, under the direction of DTSC, shall conduct habitat suitability assessments to determine whether suitable habitat (i.e., vernal pools, depressions) is present within remediation areas. Focused surveys for Riverside fairy shrimp and vernal pool fairy shrimp shall be conducted within 2 years prior to remediation activities proposed within suitable habitat, in accordance with USFWS protocols. If focused surveys reveal Riverside fairy shrimp or vernal pool fairy shrimp occupying proposed remediation areas, no ground disturbance shall occur until the applicant consults with USFWS and CDFW regarding additional avoidance and minimization measures based upon the conditions at the time, or until the amount of take is determined and authorized in the USFWS's Biological Opinion.

Mitigation Measure BIO-9: Special-Status Invertebrates. Prior to any vegetation or ground disturbance associated with remediation activities, preconstruction surveys shall be conducted by a qualified biologist/expert, retained by the RPs, under the direction of DTSC, within suitable habitat for the following species: Gertsch's socalchemmis spider, Santa Monica grasshopper, Zaca shoulderband snail, Ventura shoulderband snail, Matilija shoulderband snail, and walking stick. If any of these species are found during the preconstruction surveys, a qualified biologist shall carefully catch and release the species out of the work area and to a safe area containing suitable habitat.

Mitigation Measure BIO-10: Western Spadefoot. To avoid potential impacts to western spadefoot, prior to any ground disturbance, a CDFW-approved biologist, retained by the

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		RPs, under direction of DTSC, shall conduct habitat suitability assessments within the project site to determine whether suitable habitat such as breeding pools/wetlands and nearby burrowing habitat is present. Based on the habitat assessments, suitable breeding pools and adjacent upland habitat shall be fenced or flagged by a biologist and avoided during the active and breeding season (October - May). If suitable breeding pools cannot be avoided during this season, consultation with CDFW shall occur to determine appropriate measures to offset impacts to the species. Suitable mitigation shall include the creation of onsite breeding pool habitat. A Habitat Restoration and Monitoring Plan shall be prepared and approved by the CDFW prior to any disturbance to potential spadefoot breeding pools. **Mitigation Measure BIO-11:** California Red-Legged Frog. Critical habitat for California red-legged frog (CRLF) shall be avoided to the extent feasible. If an AOC exception is applied, no further mitigation is required. If an AOC exception is not applied and designated critical habitat for CRLF is unavoidable, cleanup activities within 300 feet of CRLF critical habitat shall be monitored for the presence of CRLF by a USFWS and CDFW-approved biologist. If the biologist detects CRLF, work activities shall cease and consultation with USFWS shall occur. A habitat restoration and monitoring plan shall be prepared and approved by the USFWS that describes revegetation and stream restoration methods. **Mitigation Measure BIO-12:** Wildlife Monitoring. Prior to the daily start of cleanup activities and at the end of the work day, wildlife monitoring by the USFWS and CDFW-approved biologist, retained by RPs, under direction of DTSC, shall include inspection of any hazardous features (i.e., open trenches) that would trap, displace, injure, or kill wildlife. If nighttime construction is proposed, all lighting shall be broadcast away from any wildlife movement areas, including areas that support wildlife movement such as ephemeral drainages and closed tree canopies, to the greatest extent practical. Nighttime lighting shall be shielded downward as to avoid light spillage into the adjacent wildlife corridor to the south. Prior to the end of daily cleanup activities, the biologist shall ensure all trash is properly disposed of such that it would not be accessible to wildlife. The biologist shall monitor all open trenches and either make sure the trenches are closed by the end of the work day so no animals can enter the trench, or ensure ramps at a minimum 2:1 slope are installed in the open trench to allow animals to escape. For areas that contain suitable habitat for special-status wildlife, including species considered locally important by Ventura County, prior to and during all vegetation and ground-disturbing activities, a USFWS and CDFW-approved biologist shall monitor work areas. If any special-status wildlife species are encountered during biological monitoring or by construction workers, work shall halt until the biologist determines appropriate actions to avoid and minimize harm to the species. California fully protected species shall be avoided. Other actions may include relocation of the species for non-listed wildlife; however, relocation would not be allowed for any listed species without first obtaining	

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		take authorization from USFWS and/or CDFW. To the extent feasible, non-listed wildlife shall be relocated to a "release site" that is suitable habitat adjacent to the habitat where the species is found. **Mitigation Measure BIO-13:** Burrowing Owl. Prior to any ground disturbance of potential suitable breeding or wintering habitat for burrowing owl, a CDFW-approved biologist, retained by the RPs, under direction of DTSC, shall conduct a habitat assessment of the proposed remediation areas and reporting in accordance with the Staff Report on Burrowing Owl Mitigation (2012) to determine whether or not owls are present. Surveys shall be conducted throughout suitable habitat within 660 feet of cleanup areas to detect wintering and breeding owls, if present. If burrowing owls are detected, a Burrowing Owl Management Plan shall be prepared and approved by CDFW prior to commencement of construction. The Burrowing Owl Management Plan shall address owl specific minimization and avoidance measures, measures to protect occupied habitat, and mitigation for any impacted individuals. The Burrowing Owl Management Plan shall include mitigation for impacted occupied burrows at no less than a 3:1 ratio by installation of artificial burrows or as otherwise approved by CDFW. Prior to construction, pre-construction surveys shall be conducted no more than 14 days prior to the commencement of work activities. Within 24 hours of cleanup activities involving ground or vegetation disturbance within suitable burrowing owl habitat, a CDFW-approved biologist shall conduct a final survey to check for signs of burrowing owl. If breeding or wintering owls are detected, burrowing owls and active burrows shall be avoided and the protective buffers established in the Burrowing Owl Management Plan shall be implemented. Destruction of unoccupied wintering burrows is considered a temporary impact, and suitable wintering habitat shall be restored to pre-project or better conditions in upland areas. If an occupied burrow is impacted by project activities, mitigation for that impact shall be implemented in accordance with the Burrowing Owl Management Plan as mentioned in the prior paragraphs. **Mitigation Measure BIO-14:** Least Bell's Vireo. To avoid impacts to nesting least Bell's vireo, work activities within 500 feet of suitable nesting habitat shall be timed to avoid the season when nests may be active for this species (March 15 to September 15). If avoidance of work activities within this time period is not feasible, a USFWS protocol surveys for least Bell's vireo shall be conducted within suitable nesting habitat the season prior to initiation of work activities to determine their presence or absence within 500 feet of proposed work limits. In accordance with the USFWS survey protocol, surveys shall consist of eight site visits conducted 10 days apart during the period of April 10 to July 31. The results shall be submitted in a report to the USFWS. If the focused surveys do not indicate the presence of least Bell's vireo, no further mitigation is required.	

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		If occupied habitat and/or nesting individuals are determined to be present based on the focused survey, and work cannot be avoided during the nesting season, a preconstruction clearance survey shall be performed by a qualified biologist within 7 days prior to work activities to determine the approximate location of nesting territories within 500 feet of work areas. Surveys shall be conducted by a biologist approved by the USFWS and CDFW for conducting least Bell's vireo nest surveys, or by a biologist with least Bell's vireo survey experience, so long as the nest is not approached and/or disturbed. If a nest is detected or active breeding is determined, work shall halt within 500 feet of the nesting territory, and the area shall be monitored on a weekly basis until a qualified biologist determines the nest is no longer active and the young have fledged. **Mitigation Measure BIO-15:** Coastal California Gnatcatcher. To avoid impacts to coastal California gnatcatcher, work activities within 500 feet of suitable nesting habitat shall be timed to avoid the general avian nesting season (March 1 to September 15). If avoidance of work activities within this time period is not feasible, focused surveys for coastal California gnatcatcher shall be conducted within suitable nesting habitat to determine their presence or absence within 500 feet of work limits. A USFWS and CDFW-approved biologist shall conduct USFWS-protocol surveys for coastal California gnatcatcher during one of the timeframes below, and within 2 years prior to remediation activities proposed within suitable nesting habitat. • Minimum of 6 surveys at least 1 week apart between March 15 and June 30 • Minimum of 9 surveys conducted at least 2 weeks apart between July 1 and March 14 If the focused surveys do not indicate the presence of coastal California gnatcatcher, no further mitigation is required. If occupied habitat and/or nesting individuals are determined to be present based on the focused surveys, and work cannot be avoided during the nesting season, a preconstruction clearance survey shall be performed by a USFWS and CDFW-approved biologist within 7 days prior to work activities to determine the location of any nests within a minimum distance of 500 feet from proposed work areas. If a nest is detected, work shall halt within 500 feet of the nest, and the nest shall be monitored on a weekly basis by a qualified biologist familiar with coastal California gnatcatcher, until the biologist determines the nest is no longer active and the young have fledged. **Mitigation Measure BIO-16:** Nesting Avian Species. If the nesting season cannot be avoided and construction or vegetation removal occurs between March 1 to September 15 (January 1 to July 31 for raptors), the RPs, under the direction of DTSC, shall do the following to avoid and minimize impacts to nesting birds and raptors: • During the avian breeding season, a qualified biologist shall conduct a preconstruction avian nesting survey no more than 7 days prior to vegetation disturbance or site clearing. Surveys need not be conducted for the entire proposed remediation areas at one time; they may be phased so that surveys	

TABLE 1-8
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		occur shortly before a portion of the site is disturbed. If construction begins in the non-breeding season and proceeds continuously into the breeding season, no surveys are required. However, if there is a break of 7 days or more in cleanup activities during the breeding season, a new nesting bird survey shall be conducted before construction begins again. • The preconstruction survey shall cover all reasonably potential nesting locations on and within 300 feet of the proposed remediation areas—this includes buildings and infrastructure, and areas that would be occupied by ground-nesting species such as killdeer. A 500-foot radius shall be surveyed in areas containing suitable habitat for nesting raptors, such as trees, utility poles, rock crevices, and cliffs. • If an active nest is found during the preconstruction avian nesting survey, a qualified biologist shall implement a 300-foot minimum avoidance buffer for all passerine birds and 500-foot minimum avoidance buffer for all raptor species. The nest site area shall not be disturbed until the nest becomes inactive, the young have fledged, the young are no longer being fed by the parents, the young have left the area, and the young will no longer be impacted by the project. Buffer areas may be increased if any endangered, threatened, CDFW fully protected, or CDFW species of special concern are identified during protocol or preconstruction surveys, based on consultation with USFWS or CDFW. • If the nest(s) are found in an area where ground disturbance is scheduled to occur, the project operator shall avoid the area either by delaying ground disturbance in the area until a qualified biologist has determined that the birds have fledged and are no longer reliant upon the nest or parental care for survival, or by relocating the project component(s) to avoid the area. **Mitigation Measure BIO-17:** Ringtail. Prior to any vegetation or ground disturbance, a CDFW-approved biologist, retained by RPs, under direction of DTSC, shall locate and map all potential ringtail suitable caves and crevices in outcrop areas, and any sign of presence, such as scat or tracks, located within a 500-foot buffer of work area limits, or as determined in consultation with CDFW. This habitat assessment shall include searches for reptile hibernacula, bat roosting and colony sites, bird nesting areas, and dens utilized by San Diego desert woodrat. Once suitable dens are located, a minimum 100-foot no work buffer should be established, or an appropriate buffer established in consultation with CDFW. All work activities shall be conducted during day light hours. If remediation activities must occur within the 100-foot buffer, a CDFW-approved biologist shall monitor the den to ensure there is no sign of ringtail. **Mitigation Measure BIO-18:** Special-Status Bats. To mitigate for potential impacts to special-status bats and maternity roosts during cleanup activities, the following measures shall be implemented prior to the commencement of remediation activities:	

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		• Avoidance of Maternity Roosts. If work activities occur during the maternity roosting season (generally defined as March 1 through August 31), a qualified biologist, retained by RPs, under direction of DTSC, shall conduct a habitat assessment for potential bat maternity roosts (i.e., tree cavities, buildings, rock outcrops and crevices). If maternity roosts or bat roost sites are identified during the habitat assessment, an appropriate no-disturbance buffer shall be established at the discretion of a qualified biologist, based on the sensitivity of the bat species. If work within the buffer is deemed necessary, a qualified biologist shall monitor work activities to ensure no disturbance to the roost(s). • Exclusion Outside of Maternity Roosting Season. If bats are determined by a qualified biologist to be roosting within cleanup areas, bats shall be humanely evicted and excluded. The humane eviction/exclusion shall be conducted in the fall (September or October) preceding work activities that affect roosting bats. Exclusion in the fall is recommended to avoid impacts to hibernating bats or a maternity roost (typically April through August in southern California) when flightless young are present. To protect roosting bats, a combination of acoustic surveys of habitat around infrastructure inspection, and exit counts shall be used to survey the area that may be directly or indirectly impacted by the project. As bats may utilize dense tree canopies, snags, rock crevices or built structures over creeks/water, these habitat types should be specifically surveyed. Foraging areas should also be identified and specific flight routes to those foraging areas as well. Bats shall be identified to the most specific taxonomic level possible, and roosts shall be evaluated to determine their size and significance. Bat surveys shall include: (1) the exact location of all roosting sites (location shall be adequately described and drawn on a map); (2) the number of bats present at the time of visit (count or estimate); (3) each species of bat present shall be named (include how the species was identified); (4) the location, amount, distribution and age of all bat droppings shall be described and pinpointed on a map; (5) the type of roost; night roost (rest at night while out feeding) versus a day roost (maternity colony) must also be clearly stated; and (6) all survey results, including field data sheets should be provided to CDFW. During installation of humane eviction/exclusion devices, each crevice shall be inspected using flashlights or fiber optic scopes for the presence of day-roosting bats. At crevices where the absence of day-roosting bats is confirmed, the crevices immediately shall be sealed using materials such as foam backer rod or pipe insulation secured with adhesive to prevent bats from entering and using the crevices. At crevices where bats are visibly present or where absence cannot be confirmed, humane eviction devices shall be installed that would allow the bats to exit the crevice but prevent them from returning. The qualified biologist performing the humane eviction shall determine the exact type of eviction device to be installed and exclusionary device used. The eviction device shall remain in place for at least 14 days following installation to allow sufficient time for all	

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		the bats to vacate the crevice. After the exclusionary period, the eviction device shall be removed and exclusion device installed. The exclusion device shall remain in place for the duration of work activities, and shall be inspected weekly by a qualified biologist. All aspects of the humane eviction/exclusion of bats shall be supervised directly and monitored by a qualified biologist approved by CDFW. Following completion of activities that would impact roosting bats, the exclusion devices shall be removed by the contractor (under supervision of the qualified biologist) to allow bats to return to the roost crevices.	
IMPACT 4.3-2b: Would implementation of the initial activities have a substantial adverse effect either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS?	Potentially Significant	Implementation of Mitigation Measures BIO-1, BIO-2, and BIO-4 through BIO-18.	Significant and Unavoidable
IMPACT 4.3-3a: Would implementation of the overall site cleanup have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS?	Potentially Significant	Implementation of Mitigation Measure BIO-5, BIO-19 and BIO-20. **Mitigation Measure BIO-19:** Sensitive Habitats. For areas where an AOC exception is applied and sensitive habitats are avoided, no further mitigation is required. If an AOC exception is not applied and sensitive habitat is unavoidable, prior to vegetation removal or disturbance, a qualified biologist, retained by the RPs, under the direction of DTSC, shall characterize and map the habitats within cleanup areas in accordance with CDFW's Survey of California Vegetation and Mapping Standards (CDFW, 2015). Adjoining habitat areas shall also be included in the assessment where project activities would lead to direct or indirect impacts offsite, and impacts to these areas shall be quantified, so that mitigation areas can be determined. In addition, during vegetation or ground disturbance associated with remediation activities, a CDFW-approved biological monitor shall be onsite to establish and mark limits of sensitive habitats to be avoided to the extent feasible. The biological monitor shall document and quantify any impacts to sensitive habitats to determine the extent and type of habitats required for restoration, as needed for preparation and implementation of a site-specific revegetation plan in accordance with Mitigation Measure BIO-5 (Revegetation Plan). Soil stabilization techniques and BMPs shall also be implemented in accordance with Mitigation Measure BIO-5. Habitat mitigation acreage requirements shall be determined in consultation with CDFW and USFWS prior to any ground disturbances, and shall be indicated in the Revegetation Plan (Mitigation Measure BIO-5). For unavoidable impacts to sensitive habitats that are also jurisdictional wetlands or waters, mitigation requirements shall be developed in accordance with Mitigation Measure BIO-21 (Jurisdictional Wetlands and Waters). Remediation activities within oak woodlands shall be avoided to the extent feasible. Oak woodland mitigation requirements shall be implemented in consultation with the Ventura County Resource Management Agency Planning Division prior to disturbance of oak woodlands. Consistent with state legislation (see SB 1334), the County allows that no	Significant and Unavoidable

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		more than 50 percent of the mitigation for losses to oak woodlands to be met through tree planting; thus, at least 50 percent of the mitigation to oak woodland habitat shall be in the form of habitat protection (acquisition of intact oak woodland) and/or restoration, conducted in partnership with a conservation organization or a CDFW-approved mitigation bank. Any remaining percentage of oak woodland mitigation required, if not met through habitat protection/restoration, shall be met through oak tree plantings based on the cross-sectional area of impacted oak trees. In accordance with the Ventura County Oak Woodland Management Plan, in the non-coastal zone, tree planting of protected trees (including oak trees) is based on a 1:1 ratio of the cross-sectional area of impacted trees (and not based on the number of impacted trees). Therefore, if the tree planting mitigation option is chosen in conjunction with habitat protection/restoration, oak trees with a total cross sectional area equal to that of all oak trees removed shall be provided as oak woodland mitigation. **Mitigation Measure BIO-20:** Seed Collection for Habitat Restoration. Prior to the initiation of remediation activities, onsite seed collection of native plant species shall be initiated at the project site and nearby vicinity for onsite habitat restoration purposes. The seed shall be collected during the appropriate period for the species (e.g., May to June for Catalina mariposa lily), and stored onsite for habitat restoration. Seed collection methods, volumes, and timing shall be specified in the site-specific revegetation plan.	
IMPACT 4.3-3b: Would implementation of the initial activities have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS?	Potentially Significant	Implementation of Mitigation Measures BIO-5, BIO-19 and BIO-20.	Significant and Unavoidable
IMPACT 4.3-4a: Would the overall site cleanup have a substantial adverse effect on federally or state protected wetlands and waters through direct removal, filling, hydrological interruption, or other measures?	Potentially Significant	Implementation of Mitigation Measures BIO-4 and BIO-21. **Mitigation Measure BIO-21:** Jurisdictional Wetlands and Waters. Prior to any disturbance of aquatic, wetland, or riparian habitat, a jurisdictional delineation of wetlands and water courses shall be conducted for the purposes of identifying features or habitats that would be subject to the jurisdiction of the USACE, LARWQCB, and CDFW. The findings shall be included in a jurisdictional delineation report suitable for submittal to these agencies for obtaining a Section 404 Clean Water Act permit (CWA), Section 401 Water Quality Certification (WQC), Waste Discharge Requirements (WDR), and/or streambed alteration agreement (SAA). Prior to activities that would result in the discharge of fill or dredged material within waters of the U.S., a Section 404 CWA permit shall be obtained from the USACE and a Section 401 WQC shall be obtained from the LARWQCB. Prior to activities within streams, ponds, seeps or riparian habitat, or use of material from a streambed, the project applicant shall obtain a WDR for impacts to waters not subject to the CWA, and provide written notification to CDFW pursuant to Section 1602 of the Fish and Game Code, ensure the notification is complete as provided in Section 1602, and comply with the terms of conditions of any agreement CDFW may issue in response to the notification. to	Significant and Unavoidable

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		obtain a standard or master SAA. The RP shall also consult with LARWQCB and CDFW regarding any indirect effects to aquatic or riparian habitats resulting from groundwater pumping, and such effects shall be taken into account when compensatory mitigation to these habitats are agreed upon between the applicant and regulatory agencies during the permitting process. Based on the findings of the jurisdictional delineation report and agency verification of the extent of jurisdictional wetlands and waters, wetlands and waters shall be avoided to the extent feasible, and 100-foot setbacks shall be marked from the edge of jurisdictional waters or riparian vegetation (whichever is wider) to maintain riparian and aquatic functions and values. In areas where avoidance of stream channels is infeasible, the site slopes and hydrology of remediated areas shall be restored to pre-construction conditions to the extent possible. If impacts to wetlands are unavoidable, compensatory mitigation shall ensure no net loss of wetlands, in accordance with permit conditions. A compensatory mitigation plan addressing temporary and permanent impacts to jurisdictional wetlands and waters shall be prepared prior to disturbance. The plan shall be developed in consultation with the USACE, LARWQCB, and/or CDFW during the permitting process. It shall include a plan view graphic showing the target mitigation activities, a seeding and planting plan (species palette and application techniques), and a monitoring and reporting plan with performance standards and success criteria. The plan shall include a recommended timeline for mitigation activities and the establishment of seeded native species. The mitigation work shall begin in the same construction season as the initiation of grading within wetlands or aquatic habitats, and mitigation site grading shall be completed within 1 year of initiation (or as otherwise determined by resource agency permits). All established/enhanced habitats shall be protected in perpetuity within SSFL, subject to regular maintenance activities, if necessary, and appropriate to permitting agencies. Alternately, compensatory mitigation can be achieved through purchasing credits at a USACE- or CDFW-approved mitigation bank.	
IMPACT 4.3-4b: Would the initial activities have a substantial adverse effect on federally or state protected wetlands and waters through direct removal, filling, hydrological interruption, or other measures?	Potentially Significant	Implementation of Mitigation Measures BIO-4 and BIO-21.	Less than Significant

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
IMPACT 4.3-5a: Would the overall site cleanup interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	Potentially Significant	Implementation of Mitigation Measures BIO-12, BIO-16, and BIO-22. **Mitigation Measure BIO-22:** Wildlife Movement. To minimize potential impacts to terrestrial wildlife species and wildlife movement that would result from roadkill, the following measures shall be implemented: • If any terrestrial wildlife species are encountered during biological monitoring or by construction workers, work shall halt until a qualified biologist, retained by the RPs, under the direction of DTSC, determines appropriate actions to avoid harm to the species. Wildlife shall be allowed to leave the work area before work may resume, or a qualified biologist may relocate non-listed species to areas of suitable habitat that would not be disturbed. • To the extent practicable, truck travel on access roads and within cleanup areas should avoid dawn and dusk when wildlife activity is high. • During rain events, work shall not occur within 50 feet of aquatic habitats or within a suitable buffer as determined by a qualified biologist. • Speeds shall be limited to 25 mph or less within the proposed remediation areas.	Less than Significant
IMPACT 4.3-5b: Would the initial activities interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	Potentially Significant	Implementation of Mitigation Measures BIO-12, BIO-16, and BIO-22.	Less than Significant
IMPACT 4.3-6a: Would the overall site cleanup conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or locally important species or communities?	Potentially Significant	Implementation of Mitigation Measures BIO-1 through BIO-23. **Mitigation Measure BIO-23:** Tree Protection. The following measures shall be implemented for protected trees that would be removed, require trimming, or if grading/excavation would occur within the root zone: • Prior to any tree disturbance or ground-disturbing activities, the RPs, under the direction of DTSC, shall develop and implement a Tree Management and Preservation Plan under the direction of a certified arborist, and the plan shall be reviewed and approved by Ventura County and CDFW. The goal of the plan is to offset tree impacts through a sustainable, customized plan that is suitable for the site's unique opportunities for tree preservation, enhancement, and establishment. The plan shall identify trees protected by Ventura County, including oak, sycamore, historical and heritage trees (protected trees) or special-status trees (e.g., southern California black walnut) that would be impacted within or adjacent to remediation areas, as well as those located outside of the project footprint that would be preserved. The plan shall define direct and indirect impacts and include mitigation options within cleanup areas, as well as outside of cleanup areas, such as tree relocation or replacement, and identify appropriate reference site(s) and the locations of	Significant and Unavoidable

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		mitigation areas. The plan shall specify RPs, funding sources, restoration areas, performance standards and success criteria based on reference site(s), minimum 5-year maintenance and monitoring requirements, adaptive management strategies, and regulatory authorities. RPs, under the direction of DTSC, can mitigate trees within another RP's area if both parties agree, and such arrangements shall also be specified in both parties' tree management and preservation plans. Performance measures shall include 100 percent survival of trees relocated or replaced during the plant establishment period. • Protection measures for protected trees include fencing and protection of oak trees adjacent to construction areas. In addition, placement of fill, storage of equipment, and grading shall be prohibited within the protective zone (minimum of 5 feet from the dripline, or 15 feet from the trunk of the tree, whichever distance is greater) of any tree proposed for preservation. Grade changes near the protective zones of oak trees shall be limited to the greatest extent feasible. Retaining walls shall be used to protect oaks proposed for preservation from surrounding cut and fill, and no surfaces shall be placed within a 6-foot radius of oak tree trunks; any retaining walls shall be placed outside of the protective zone of the oak tree to be preserved. Any encroachment within the specified limits above shall require monitoring by a qualified arborist, so that measures can be implemented to avoid any long-term impacts to the tree, such a specific root pruning techniques if any minor roots would be disturbed, or to monitor branch pruning to allow for necessary equipment access. All oak trees encroached by subsurface cleanup activities involving excavation or grading shall be monitored for a minimum of 1 year, and permanent encroachments to oak trees such as placement of fill (i.e., pavement) shall be monitored for a minimum of 2 years to assess the health of the tree and identify signs of stress that occurred as a result of the encroachment. If the health of the protected tree is determined to be in decline as a result of the project's disturbance within the tree's protective zone, the tree shall be replaced in accordance with Mitigation Measure BIO-23, above.	
IMPACT 4.3-6b: Would the initial activities conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or locally important species or communities?	Potentially Significant	Implementation of Mitigation Measures BIO-1 through BIO-10, and BIO-12 through BIO-23.	Significant and Unavoidable
IMPACT 4.3-7: Would the overall site cleanup or initial activities conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?	Less than Significant	No mitigation is required.	N/A

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
4.4 Cultural Resources			
IMPACT 4.4-1a: Would implementation of the overall site cleanup cause a substantial adverse change in the significance of archaeological resources qualifying as historical resources or unique archaeological resources as defined in CEQA Guidelines Section 15064.5?	Potentially Significant	Implementation of Mitigation Measures CUL-1 through CUL-10. **Mitigation Measure CUL-1:** Cultural Resources Personnel Professional Qualifications Standard. Cultural resources consulting staff shall meet, or be under the direct supervision of an individual meeting, the minimum professional qualifications standards (PQS) set forth by the Secretary of the Interior (SOI) (codified in 36 CFR Part 61; 48 FR 44739). **Mitigation Measure CUL-2:** Cultural Resources Management Plan. Prior to the start of cleanup activities, an SOI-qualified archaeologist shall be retained by the RPs, and shall be subject to DTSC approval, to prepare a comprehensive Site-Wide Cultural Resources Management Plan (CRMP), which shall be submitted to DTSC for review and approval prior to the start of any ground-disturbing activities. The purpose of the CRMP is to document the actions and procedures to be followed to ensure avoidance or minimization of impacts to cultural resources consistent with CEQA Guidelines Section 15126.4(b), and to lay out a detailed program of mitigation for direct and indirect impacts on cultural resources during project implementation. The CRMP shall cover all project activities across the entire project site, and for the life of the project. The CRMP shall include, but is not limited to, the following elements and shall be consistent with all mitigation measures contained in this document: • A description of the roles and responsibilities of cultural resources personnel, and the reporting relationships between project construction management and the mitigation and monitoring team, including lines of communication and notification procedures. • Contact list for project personnel and provisions for regular contact list updates. • Specific measures to be taken to avoid impacts to significant cultural resources, such as the designation of Environmentally Sensitive Areas, consistent with Mitigation Measure CUL-4 (Avoidance and Preservation in Place). • An archaeological and Native American monitoring plan to be employed through the life of the project, including protocols to be followed during routine monitoring and during discovery situations; roles of archaeological and Native American monitors; agency communication requirements; and reporting requirements (consistent with Mitigation Measure CUL-5 [Archaeological and Native American Monitoring]). • High-resolution maps for use by construction personnel to identify locations where archaeological monitoring is required, based on the Santa Susana Field Laboratory Geoarchaeological Assessment (Lockwood, 2016).	Significant and Unavoidable

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		• Native American participation in all cultural-resources-related actions consistent with Mitigation Measures CUL-11 through CUL-13. • A Research Design to be used to guide the evaluation of cultural resources, including a regional cultural setting, appropriate regional research questions, and field methods for the testing and evaluation of cultural resources. • Prescribed actions to be taken in the event that cultural resources are inadvertently discovered during construction, or known resources are impacted in an unanticipated manner, consistent with Mitigation Measure CUL-6 (Inadvertent Discovery), including, but not limited to: - Establishment of an Environmentally Sensitive Area, marked with exclusion fencing, with a minimum of a 100-foot radius unless a smaller buffer is agreed to among the SOI-qualified archaeologist, Interested Tribes, and relevant RP, and upon DTSC approval. - Documentation of resource(s) on California Department of Parks and Recreation (DPR) 523 forms. - Inspection of the resource(s) by a qualified archaeologist. - Evaluation of the resource for listing in the California Register of Historical Resources (CRHR) (considering criteria 1 through 4) or as a unique archaeological resource, and as a contributor to the Simi Hills Archaeological District and/or the SSFL Traditional Cultural Property (TCP), following the research design established in the CRMP and consistent with the Simi Hills Archaeological District Study (Bray et al., 2016). • Treatment protocols for significant cultural resources that cannot be avoided and analysis of data in a regional context, consistent with Mitigation Measures CUL-4 (Avoidance and Preservation in Place) and CUL-6 (Inadvertent Discovery) which shall include, but not be limited to: - A sufficient avoidance buffer, recommended by the SOI-qualified archaeologist, in coordination with the relevant RP, Interested Tribes, and with the approval of DTSC, to protect the resource until data recovery is completed; - Sample excavation. - Surface artifact collection. - Site documentation. - Special studies where sufficient data exists, as determined by the SOI-qualified archaeologist, including but not limited to radiocarbon dating, residue analysis, sourcing, and other materials analysis.	

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		- Historical research, with the aim to target the recovery of important scientific data contained in the portion of the significant resource to be impacted by the project. - Documentation, photography, and collection of oral histories. • A report documenting the methods and results of the treatment of the resource shall be prepared by the SOI-qualified archaeologist, following Archaeological Resources Management Report (ARMR) guidelines, and shall be submitted to DTSC for review and approval within 90 days of the completion of treatment, and shall also be submitted to the South Central Coastal Information Center (SCCIC). • Procedures for the appropriate treatment of human remains, consistent with Mitigation Measure CUL-18 (Human Remains). • Procedures for Tribal access. • Procedures for annual site condition verification, to document the condition of cultural resources throughout the life of the project and if impacts are observed, to provide additional protections, including but not limited to erosion controls and access barriers (consistent with Mitigation Measure CUL-8, Annual Site Condition Verification). • Health and safety requirements for cultural resources personnel working onsite, including 40-hour Hazwoper training and copy of current certification for project records. • Reporting procedures, including the requirement that reports resulting from documentation, evaluation, and treatment of cultural resources be filed with the SCCIC annually by April 1 of each year for work completed during the previous calendar year. • Artifact collection, retention/disposal, and curation policies, including a statement that all cultural materials retained will be prepared in accordance with the requirements of an identified, qualified curatorial facility, per Mitigation Measure CUL-7 (Curation of Project Materials), and that the RPs shall be responsible for all expenses associated with the curation of the materials at the qualified curatorial facility. • Preparation of an Annual Report that includes all cultural resources related activities that occurred for the previous calendar year. The annual report shall be submitted to DTSC for review and comment by March 1 of the year following the reporting year. The Annual Report shall include all documentation pertaining to Tribal communications required by Mitigation Measures CUL-11 through CUL-13, the Worker Cultural Resources Sensitivity Program required by Mitigation Measure CUL-3, the Annual Archaeological Monitoring Report with supporting documentation including	

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		daily logs required by Mitigation Measure CUL-5, all documentation resulting from eligibility evaluations and data recovery or other treatment resulting from Mitigation Measures CUL-4, and CUL-6, and the research design produced as part of the CRMP, and documentation resulting from the annual site condition verification program required by Mitigation Measure CUL-8; and • Biennial review of the effectiveness of the CRMP by DTSC, in coordination with the RPs, SOI-qualified archaeologist, and Interested Tribes, during the life of the project to determine the need for any revisions to the CRMP either based on new cultural resources discoveries or other new information for which the CRMP provides inadequate direction, or revisions necessary to address procedural inadequacies. **Mitigation Measure CUL-3:** Worker Cultural Resources Sensitivity Program. A worker cultural resources sensitivity program shall be implemented for the project. Prior to any ground-disturbing activity, an initial sensitivity training session shall be provided by the RPs to all project employees, contractors, subcontractors, and other professionals prior to their involvement in any ground-disturbing activities, with subsequent training sessions occurring on a quarterly basis to accommodate new personnel becoming involved in the project. The RPs shall invite Interested Tribes to participate in and present Native American perspectives during the training sessions if they so choose. The sensitivity program shall address: the cultural (Native American, archaeological, and paleontological) sensitivity of the project site and a tutorial providing information on how to identify these types of resources; appropriate behavior; worker access routes and restrictions; work area cleanliness; specific procedures to be followed in the event of an inadvertent discovery per the CRMP; safety procedures when working with monitors; and consequences in the event of noncompliance. The RPs shall notify DTSC and the Interested Tribes no less than 2 weeks prior to the training sessions. The program agenda and materials together with attendance rosters for the previous year shall be provided to DTSC as part of the Annual Report due March 1 of each year. **Mitigation Measure CUL-4:** Avoidance and Preservation in Place. The RPs shall carry out, under the direction of DTSC, and require all subcontractors to carry out, all project activities in ways that minimize significant impacts to cultural resources. Avoidance and preservation in place shall be the preferred manner of mitigating impacts to historical and tribal cultural resources, taking into consideration the project objectives, in order to maintain the important relationship between artifacts and their archaeological context and to preserve each resource's scientific value, as well as to preserve the cultural values ascribed to resources by the Interested Tribes. Where DTSC has determined that avoidance will be implemented, the construction zone shall be narrowed or otherwise altered to avoid cultural resources. In coordination with the SOI-qualified archaeologist, avoidance of cultural resources shall be ensured by the delineation of Environmentally Sensitive Areas, including an area within 100 feet of the	

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		known or previously mapped boundaries of the resources, and the resources shall be marked with exclusion markers as "Environmentally Sensitive Areas." Protective fencing shall not identify the protected area as a cultural resource area in order to discourage unauthorized disturbance or collection of artifacts. Consistent with Mitigation Measure CUL-5 (Archaeological and Native American Monitoring), a qualified archaeological monitor shall monitor all project-related ground disturbing activities within 100 feet of the Environmentally Sensitive Areas, in order to ensure avoidance. If due to cleanup requirements a cultural resource cannot be avoided, then the resource shall be evaluated for its individual eligibility for listing in the CRHR or as a unique archaeological resource, and for each resource's eligibility as a contributor to the Simi Hills Archaeological District and or the SSFL TCP, following the evaluation procedures detailed in the CRMP and consistent with the Simi Hills Archaeological District Study (Bray et al., 2016). If the resource is determined to be significant (i.e., eligible for individual listing in the CRHR or as a unique archaeological resource, and/or as a contributor to the Simi Hills Archaeological District and/or the SSFL TCP), DTSC, in coordination with Interested Tribes, would have the option to exercise the AOC exception for "Native American artifacts that are formally recognized as Cultural Resources" or, in the case of resources located within Boeing-owned property (where the Exception is not applicable), may avoid impacts to the resource through coordinated project redesign. If DTSC elects not to exercise the AOC exception, or if avoidance of the significant cultural resource is determined by DTSC to be infeasible, then the resource would be subject to appropriate data recovery or treatment, following the treatment and reporting procedures detailed in the CRMP, that addresses the resource's relevant eligibility criteria and its eligibility as an individual resource, and/or a contributor to the District and/or TCP, as determined by DTSC and the SOI-qualified archaeologist, and in coordination with Interested Tribes. **Mitigation Measure CUL-5:** Archaeological and Native American Monitoring. Archaeological monitoring shall be conducted during project-related ground-disturbing activities for the purpose of identifying and avoiding impacts to archaeological resources, consistent with the monitoring plan detailed in the CRMP. Ground-disturbing activities include, but are not limited to, brush clearance, grubbing, excavation, trenching, grading, and drilling. Full-time archaeological monitoring shall occur during the following three activities: • All initial brush clearance and vegetation removal. • All ground-disturbing activities within 100 feet of an Environmentally Sensitive Area. • All ground-disturbing activities within areas identified as having a high potential for buried archaeological resources as identified in Figure 7 of the *Santa Susana Field Laboratory Project: Geoarchaeological Assessment*	

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		(Lockwood, 2016). Archaeological monitors shall have a B.S. or B.A. degree in anthropology, archaeology, or a related field, and at least one year's experience monitoring in California and shall be 40-hour HAZWOPER trained. and currently certified. Archaeological monitors shall work under the direct supervision of an archaeologist meeting the minimum professional qualifications standards (PQS) set forth by the Secretary of the Interior (codified in 36 CFR Part 61; 48 FR 44739) consistent with Mitigation Measure CUL-1 (Cultural Resources Personnel Professional Qualifications Standards). The number of archaeological monitors onsite at any given time during the three categories of ground disturbing activities described above shall be dependent on the size and geographic configuration of areas in which work is occurring. Archaeological monitors shall be positioned in proximity to the work sufficient for adequate visibility of surface and subsurface conditions. Typically, if two work areas are positioned more than 500 feet apart, a second monitor would be necessary to provide adequate monitoring of the activities. The number of archaeological monitors required for any given activity shall be determined by the SOI-qualified archaeologist and with the approval of DTSC. Interested Tribes shall be invited to conduct Native American monitoring during all ground-disturbing activities associated with the project. A Native American monitor shall be invited to be onsite daily to coordinate with the archaeological monitors and to provide tribal perspectives in the event a discovery occurs. The Native American monitor shall be free to visit different activity areas throughout the course of a given day, notwithstanding any limitations based on safety concerns the RPs may identify in coordination with DTSC. Native American monitors shall be afforded a minimum of 1 weeks' notice prior to the commencement of project-related ground-disturbing activities. During project activities, Native American monitors shall be provided with weekly work forecasts to facilitate scheduling of monitors. Because project implementation activities are often unpredictable, there may be changes in work activities. Native American monitors shall be notified by the RPs of any scheduling changes as soon as possible. The RPs will use daily field meetings, telephone, and email as methods of communicating work schedules. Native American monitors shall be alerted at the end of each work day whether work activities will be taking place the following day. Archaeological monitors shall complete daily monitoring logs. Monthly progress reports shall be submitted to DTSC. An Annual Monitoring Report documenting monitoring activities shall be prepared following Archaeological Resources Management Report (ARMR) guidelines and shall be submitted to DTSC annually on March 1 for the previous calendar year as part of the Annual Report required by Mitigation Measure CUL-2. The monitoring reports shall document dates of monitoring and monitoring participants, activities observed, soil types observed, and any archaeological resources encountered. The RPs shall provide Interested Tribes an opportunity to contribute their monitoring observations to the monitoring reports. DPR 523 forms, following the OHP's Instructions for Recording Historical Resources, shall be prepared and filed with the	

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		SCCIC for all newly identified or updated resources and shall be appended to the Annual Monitoring Report. The Annual Monitoring Report shall be provided to the Interested Tribes for review and comment consistent with Mitigation Measure CUL-11 (Native American Document Review and Comment). **Mitigation Measure CUL-6:** Inadvertent Discovery of Potential Historical Resources and Unique Archaeological Resources. In the event that cultural resources are inadvertently discovered during ground-disturbing activities, work in the vicinity of the discovery shall immediately cease within a 100-foot radius and temporary protective measures shall be implemented pursuant to provisions of the CRMP. If an archaeological monitor is present onsite, he or she shall be summoned to assess the significance of the find in coordination with the SOI-qualified archaeologist. If a monitor is not present onsite, no work within 100 feet of the find shall occur until an archaeological monitor or the SOI-qualified archaeologist can report to the site to assess the significance of the find. The RPs shall notify DTSC within 24 hours of the discovery of any potential historical, unique archaeological, or tribal cultural resources. Avoidance and preservation in place shall be the preferred manner of mitigating impacts to such resources, taking into consideration the project objectives of soil remediation, in order to maintain the important relationship between artifacts and their archaeological context and to preserve each resource's scientific value, as well as to preserve the cultural values ascribed to resources by the Interested Tribes. The feasibility of avoidance, as it relates to the project objectives of soil remediation, shall be determined by DTSC based on factors including soil contamination levels in coordination with Interested Tribes and the relevant RP. Avoidance shall be ensured by the delineation of Environmentally Sensitive Areas, including an area within 100 feet of the resource (unless a smaller buffer is agreed to between the SOI-qualified archaeologist, Native American monitor, RP, and upon DTSC approval), which shall be marked with exclusion markers. Protective fencing shall not identify the protected area as a cultural resource area in order to discourage unauthorized disturbance or collection of artifacts. If due to project design changes or cleanup requirements a cultural resource cannot be feasibly avoided, then the resource shall be evaluated for individual eligibility for listing in the CRHR or as a unique archaeological resource, and for its eligibility as a contributor to the Simi Hills Archaeological District and/or the SSFL TCP, following the evaluation procedures detailed in the CRMP and consistent with the Simi Hills Archaeological District Study (Bray et al. 2016). If the resource is determined to be significant (i.e., eligible for listing in the CRHR or as a unique archaeological resource, or as a contributor to the Simi Hills Archaeological District and/or the SSFL TCP), DTSC, in coordination with Interested Tribes, would have the option to exercise the AOC exception for "Native American artifacts that are formally recognized as Cultural Resources" (AOC exception) or, in the case of resources located within Boeing-owned property, may avoid impacts to the resource through project redesign. If DTSC elects not to exercise the AOC exception, or if avoidance of the significant cultural resource is determined to be infeasible by DTSC, then the resource would be subject to appropriate	

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		data recovery or treatment, following the treatment and reporting procedures detailed in the CRMP, that addresses the resource's relevant eligibility criteria and its eligibility as an individual resource, and/or a contributor to the District or SSFL TCP, as determined by DTSC and the SOI-qualified archaeologist, and in coordination with Interested Tribes. Documentation resulting from eligibility evaluations and data recovery or other treatment occurring during the previous calendar year shall be made part of the Annual Report due to DTSC by March 1 of the following calendar year as prescribed in Mitigation Measure CUL-2 (Preparation of a Cultural Resources Management Plan). **Mitigation Measure CUL-7:** Curation of Project Materials. Prior to the start of initial activities or overall site cleanup, the RPs shall agree upon, and upon discretionary approval by DTSC, a single accredited repository at which to curate all archaeological materials recovered from SSFL. The repository shall be located in southern California so that the materials are available locally to Tribal members and researchers and shall meet the standards provided in the California State Historical Resources Commission's Guidelines for the Curation of Archaeological Collections. The RPs shall work with the identified local curatorial facility to transfer curation of materials currently in the RPs' possession or currently housed at a non-local facility, to the agreed-upon accredited local repository such that the materials can be accessioned as a unified collection. If it is determined that there is no southern California curation facility that can accommodate the entire SSFL collection, other accredited facilities in the State of California may be considered. **Mitigation Measure CUL-8:** Annual Site Condition Verification. As part of the CRMP required by Mitigation Measure CUL-2, the RPs shall establish an annual site condition verification program to document the condition of all identified cultural resources in the project site including evaluated and unevaluated resources. The site verification program shall be implemented by an SOI-qualified archaeologist on an annual basis for the duration of the project. The RPs shall afford Interested Tribes the opportunity to participate in Native American monitoring during the annual site condition verification program and provide, at a minimum, 2 weeks' written notice to Interested Tribes prior to the commencement of the program each year. The goal of the annual site condition verification program is to monitor on an annual basis whether project-related activities are indirectly impacting known cultural resources as a result of an increase in personnel and human activity onsite, changes in erosional patterns due to the movement of soils onsite, and other disturbances to resources that could be an inadvertent result of project activity. The annual site condition verification program shall include: development of Site Condition Assessment Forms and database; confirmation of resource boundaries with submeter GPS; relocation of previously identified features; confirmation of locations, quantities, and types of artifacts present; examination of the condition of rock art; general condition and disturbances observed; and photography to document whether any change in resource condition has occurred. DPR 523 form updates, following OHP *Instructions for Recording Historical Resources*, shall be prepared and filed with the SCCIC for all resources where changes in setting or	

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		condition are observed. The Site Condition Assessment Forms, database spreadsheet, DPR 523 form updates, and documentation of the implementation of additional protective measures for resources where impacts are observed, shall be provided to DTSC annually by March 1 for the previous calendar year as part of the Annual Report required by Mitigation Measure CUL-2 (Preparation of a Cultural Resources Management Plan). The RPs shall notify DTSC upon scheduling and completion of the program each year. Mitigation Measure CUL-11 (Native American Document Review and Comment) shall govern review and comment of the report by Interested Tribes. If the annual site condition verification program identifies impacts to cultural resources resulting from implementation of the project, or if, at any time, the RPs or DTSC become aware of such impacts, the appropriate RP shall notify DTSC immediately and implement additional protective measures including but not limited to erosion controls and access barriers or other measures as necessary to protect cultural resources from project impacts, as recommended by the SOI-qualified archaeologist in coordination with Interested Tribes. **Mitigation Measure CUL-9:** Comprehensive District Study and National Register Nomination. Following the completion of all archaeological studies related to project implementation, the RPs shall retain, and DTSC shall have discretionary approval of, an SOI-qualified archaeologist who will prepare a Comprehensive Simi Hills Archaeological District Study. The Study shall build on the previously prepared Simi Hills Archaeological District Study (Bray et al., 2016), and shall document and analyze all additional archaeological resources data generated as a result of the project, including data collected through testing, data recovery, and treatment. The Study shall consider similar research questions shall re-evaluate the boundaries of and contributors to the District in light of the additional data and project impacts. If the Study finds that the District continues to retain sufficient integrity for listing, a National Register Nomination for the District will be prepared. The Study and Nomination shall be submitted to DTSC for review and comment within 1 year of the completion of project activities. The Study shall be submitted to the SCCIC once approved and finalized and the Nomination shall be coordinated by the SOI-qualified archaeologist with SHPO and National Park Service. **Mitigation Measure CUL-10:** Burro Flats Site Complex Documentation and National Register Nomination. Prior to project implementation, NASA and Boeing shall retain, and DTSC shall have discretionary approval of, an SOI-qualified archaeologist to confirm the boundary of the Burro Flats Site Complex on both NASA and Boeing land. Based on this boundary confirmation, the SOI-qualified archaeologist shall prepare an updated DPR 523 form and National Register Nomination form for the Burro Flats Site Complex. The Nomination shall be prepared within one year of the boundary confirmation. The updated Nomination shall utilize and synthesize all available existing information on the Burro Flats Site Complex and shall be coordinated by the SOI-qualified archaeologist with SHPO and National Park Service.	

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
IMPACT 4.4-1b: Would implementation of the initial activities cause a substantial adverse change in the significance of archaeological resources qualifying as historical resources or unique archaeological resources as defined in CEQA Guidelines Section 15064.5?	Potentially Significant	Implementation of Mitigation Measures CUL-1 through CUL-10.	Significant and Unavoidable
IMPACT 4.4-2a: Would implementation of the overall site cleanup cause a substantial adverse change in the significance of a tribal cultural resource as a result of the physical destruction and alteration to the characteristics of the property that convey its significance and qualify it for inclusion in the CRHR as defined in CEQA Guidelines Section 21074?	Potentially Significant	Implementation of Mitigation Measures CUL-1 through CUL-16, BIO-2, BIO-5, BIO-12, and BIO-19. **Mitigation Measure CUL-11:** Native American Document Review and Comment. Interested Tribes shall be afforded the opportunity to review and comment on all draft cultural-resources-related documentation prepared as a result of the project. Native American comments must be provided in writing for consideration by DTSC, in coordination with the RPs prior to a document being finalized. Draft cultural resources documents to be made available for Interested Tribes' comment shall include, but not be limited to the CRMP; cultural-resources-related technical reports; site condition verification documentation; and annual reports. **Mitigation Measure CUL-12:** Native American Access. Interested Tribes shall be provided reasonable access to the project site upon written request to the RPs, to the extent that the landowners and land managers have the authority to facilitate such access and be consistent with existing laws, regulations, and agreements as they pertain to property within the project site. There may be access restrictions into certain areas, subject to DTSC review, with regard to health and safety concerns and to ensure noninterference with approved remediation activities. The RPs shall retain copies of all access-related communications to be provided to DTSC on an annual basis, as required by Mitigation Measure CUL-13 (Native American Communication). **Mitigation Measure CUL-13:** Native American Communication. The RPs shall communicate with Interested Tribes prior to the start of and during remediation activities for the project, regarding project progress, upcoming site remediation activities, and other topics of interest to Interested Tribes. The RPs shall document, and accommodate, the Tribes' preferences for method and timing of communication and for transmitting large documents. Outreach efforts between the Interested Tribes and the RPs shall be communicated by the RPs to DTSC on an annual basis during project activities for review and input, as part of the annual report due to DTSC on March 1 of each year, as required by Mitigation Measure CUL-2 (Preparation of a Cultural Resources Management Plan). **Mitigation Measure CUL-14:** Comprehensive Ethnographic Study. Within 1 year following the start of project activities, the RPs shall retain, and DTSC shall have discretionary approval of, a qualified ethnographer with demonstrated expertise in the field of ethnography and cultural anthropology, to prepare a Comprehensive Ethnographic Study that documents the ethnographic context in which the SSFL TCP and contributing archaeological resources exist, focusing on the SSFL and surrounding	Significant and Unavoidable

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		Simi Hills. The qualified ethnographer shall be selected in coordination with Interested Tribes, to the extent that Interested Tribes elect to participate. The purpose of the Study will be to provide an ethnographic context for the SSFL TCP, to attempt to capture the significance and traditional cultural value ascribed to the SSFL TCP, and to provide a form of preservation and dissemination of Native American perspectives of the landscape and the places and material remains within it. The Study shall be prepared in coordination and collaboration with Interested Tribes, to the extent that Tribes choose to participate, and shall include interviews with representatives of Interested Tribes who express interest in participating. The draft Study shall be submitted to DTSC and Tribal governments for review and comment within 2 years of the start of project activities. **Mitigation Measure CUL-15:** Rock Art Site Recordation and Interpretation. The RPs shall retain, and DTSC shall approve, an SOI-qualified archaeologist with demonstrated expertise in the field of rock art studies to coordinate the comprehensive recordation and interpretation of all archaeological sites within the project site that contain rock art. The methods of recordation and the interpretations developed shall be coordinated and collaborated with Interested Tribes. The rock art site recordation component shall involve thorough documentation of archaeological sites containing rock art, their immediate setting within the SSFL and Simi Hills, and the rock art itself, with the goal of documenting their condition prior to project implementation, and preparing an interpretive report focused on the results of the documentation, and interpretation of the age, content, and artistic style of the rock art. The documentation shall be accomplished through the use of accepted methodologies and current state-of-the-art technologies, which shall include (but are not limited to) mapping, digital photography, stereo spherical gigapixel photography, drawing, photogrammetry, laser scanning, digital image processing techniques including D-Stretch, Reflectance Transformation Imaging, residue analysis, and archaeological dating and/or other rock art documentation techniques provided by the Center of Interdisciplinary Science for Art, Architecture, and Archaeology at University of California, San Diego, or other service provider who conducts similar documentation techniques. The rock art site documentation shall be completed prior to the start of project activities in order to capture the pre-project condition of the rock art sites and to ensure that the pre-project condition and setting and feeling of the rock art sites is captured prior to disturbances. The rock art interpretation component (an interpretive report) shall include a description of the regional context for the rock art; a review of regional and local rock art types, techniques, pigments, and chronologies; and interpretation of symbolism. The RPs shall collaborate with the SOI-qualified archaeologist, Interested Tribes (to the extent Tribes chose to participate), and DTSC on the content and interpretations to be studied and presented in the report. The rock art documentation and report shall be submitted to DTSC within 1 year of the completion of recordation and shall be submitted to the SCCIC and copies to Interested Tribes upon request to the RPs.	

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		Mitigation Measure CUL-16: Research Grant for Future Cultural Resources Studies. Within 6 months of project approval, each RP shall make a 1-year grant contribution to the National Science Foundation (NSF) for studies on topics of tribal interest related to the cultural resources of the SSFL such that members of the Tribal community may identify aspects of the SSFL TCP and related archaeological resources impacted by the project that may warrant further preservation through study. Formal documentation that the grant contribution has been made to the NSF shall be provided to DTSC within 7 months of project approval. Each of the three grants would enable an undergraduate or graduate student to use the cultural resources data obtained through the implementation of project-related archaeological, ethnographic, and rock art mitigation in the preparation of a research project, such as a thesis, dissertation, or published paper. Each student would enter into an agreement that sensitive archaeological site and tribal information is kept confidential. If the NSF is unable to find students interested in using the grant for studies of the cultural resources of the SSFL within 10 years of the funding of the grant, then the grant funds will be returned to the RPs or their designees, who may, at their discretion, elect to contribute the funding to another, similar topic of study in the larger Santa Monica Mountains Region and adjacent coast.	
IMPACT 4.4-2b: Would implementation of the initial activities cause a substantial adverse change in the significance of tribal cultural resources as a result of the physical destruction and alteration to the characteristics of the property that convey its significance and qualify it for inclusion in the CRHR as defined in CEQA Guidelines Section 21074?	Potentially Significant	Implementation of Mitigation Measures CUL-1 through CUL-16, along with Mitigation Measures BIO-2, BIO-5, BIO-12, and BIO-19.	Significant and Unavoidable
IMPACT 4.4-3a: Would implementation of the overall site cleanup cause a substantial adverse change in the significance of built environment resources qualifying as historical resources as defined in CEQA Guidelines Section 15064.5?	No Impact	No mitigation is required.	N/A
IMPACT 4.4-3b: Would implementation of initial activities cause a substantial adverse change in the significance of built environment resources qualifying as historical resources as defined in CEQA Guidelines Section 15064.5?	No Impact	No mitigation is required.	N/A
IMPACT 4.4-4a: Would implementation of the overall site cleanup directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Potentially Significant	Implementation of Mitigation Measure CUL-17. **Mitigation Measure CUL-17:** Paleontological Resources Monitoring and Mitigation Plan. Prior to the start of initial project or program level activities, the RPs shall retain a qualified principal paleontologist (investigator) meeting the SVP (2010) standards to prepare a Paleontological Resources Monitoring and Mitigation Plan (PRMMP). The PRMPP shall be approved by DTSC before work (including, but not limited to, ground-disturbing activities) may be initiated on the site. The PRMPP shall include: • Retention of Qualified Staff: The PRMMP shall stipulate that qualified	Less than Significant

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		professionals meeting the SVP (2010) standards shall conduct paleontological work. • Construction Worker Sensitivity Training: The PRMMP shall state that construction personnel shall be trained to understand what paleontological resources are, which types of fossils may be encountered during ground disturbance, and measures used to protect paleontological resources in compliance with CEQA and other relevant legislation. Construction personnel shall also be trained on the procedures to be followed upon the discovery of paleontological materials with and without a paleontological monitor onsite. Personnel shall be instructed that unauthorized collection or disturbance of fossils is unlawful and can result in criminal penalties. • Monitoring Requirements: The PRMMP shall require full-time monitoring of ground disturbing activities in the high sensitivity Santa Susanna Formation (Tsu, Tsuv, and Tsi), the moderate to high lower Chatsworth Formation (Kcsh), and the moderate sensitivity detrital sediments of Lindero Canyon geological unit (Tls and Tlsc). The PRMMP shall also require part-time monitoring below a depth of 3 feet in the low to moderate sensitivity upper Chatsworth Formation (Kcs) and low sensitivity Quaternary alluvium (Qa) to ensure no significant paleontological resources are being impacted. The PRMMP shall develop a coordination strategy to ensure adequate monitoring of construction disturbances, and procedures to reduce, or discontinue monitoring in nonproductive geological lenses per the SVP (2010) guidelines. The PRMMP shall also detail the daily and weekly reporting requirements of the paleontological monitor and/or qualified principal paleontologist. • Preparation of High Resolution Geological Maps: The PRMMP shall require preparation of high resolution maps that depict the geological formations/units underlying the SSFL. The maps shall detail the locations of high sensitivity Santa Susanna Formation (Tsu, Tsuv, and Tsi), the moderate to high lower Chatsworth Formation (Kcsh), and the moderate sensitivity detrital sediments of Lindero Canyon geological unit (Tls and Tlsc) where full-time monitoring is required, and the locations of low to moderate sensitivity upper Chatsworth Formation (Kcs) and low sensitivity Quaternary alluvium (Qa) where part-time monitoring is required. • Discovery and Fossil Recovery Procedures: The PRMMP shall present procedures for halting or redirecting construction and setting up an exclusion zone with flagging tape when the paleontological monitor or construction personnel make a discovery if the monitor is not present. Provisions shall be included that identify notification procedures for unanticipated fossil discoveries by construction personnel when a paleontological monitor is not present and describe fossil recovery methods (including necessary equipment) and adequate data collection. The PRMMP shall emphasize the importance of	

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		collecting accurate geographic, stratigraphic, and sedimentologic data (including samples for radiometric dating if applicable). • Sampling: The PRMMP shall include sampling methods and frequency of sampling (e.g., collecting sediment samples for microfossil recovery per the SVP [2010] guidelines), as well as other applicable procedures. The qualified paleontologist overseeing the project shall determine if and when it is appropriate to test a horizon for the presence of microfossils based on sedimentologic indicators (abundant plant debris, fine-grained sediments, carbonate nodules, etc.). The test sample shall consist of approximately 6000 pounds of sediment to be screened onsite or offsite. If scientifically significant microfossils are recovered, a standard sample shall be collected and screened on or offsite (a standard sample is approximately 4 cubic yards or 6000 pounds per the SVP [2010] guidelines). Contaminated fossils should be safely handled to ensure worker health and safety. Specific safe handling procedures should be established in the PRMMP. • Post-Excavation Preparation, Analysis, Reporting, and Curation: The PRMMP shall discuss procedures for post-excavation preparation and analyses of fossil specimens collected during project-related excavations and shall provide analytical techniques. The report shall detail the identification of specimens, final curation of specimens at an accredited facility, data analyses, and reporting. The final monitoring report shall include a discussion of the background information for the project; the geology and stratigraphy of impacted geological units; mitigation methods, including fossil treatment and any recommendations for further work; a description and inventory of salvaged paleontological resources; scientific importance of the salvaged paleontological resources; the results and findings of analyses conducted on fossil remains; research questions that may be answered or raised as a result of the analyses; and pertinent maps with fossil localities. Maps showing fossil localities shall be included in a confidential appendix.	
IMPACT 4.4-4b: Would implementation of the initial activities directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Potentially Significant	Implementation of Mitigation Measure CUL-17.	Less than Significant

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
IMPACT 4.4-5a: Would implementation of the overall site cleanup disturb human remains, including those interred outside of formal cemeteries?	Potentially Significant	Implementation of Mitigation Measures CUL-1 through CUL-6 and CUL-18. **Mitigation Measure CUL-18:** Inadvertent discovery of human remains. In the event of inadvertent discovery of human remains, all work shall be halted within a 100-foot radius and temporary protective measures shall be implemented. Avoidance and preservation in place shall be emphasized as the preferred manner of mitigation for human remains and disturbances shall be avoided to the maximum extent feasible as it relates to the project objectives of soil remediation, as determined by DTSC, in coordination with Interested Tribes and respective RPs. The RPs shall notify DTSC of any inadvertent discovery of human remains within 24 hours of the discovery. On non-federally owned land (Area I, Area III, Area IV, the Northern Undeveloped Area, and the Southern Undeveloped Area), the RPs shall contact the Ventura County Coroner to evaluate the remains and follow the procedures and protocols set forth in Section 15064.4 (e)(1) of CEQA. If the Coroner determines the remains are Native American in origin, the Coroner shall contact the NAHC. As provided in PRC Section 5097.98, the NAHC shall identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent (MLD) shall be afforded the opportunity to provide recommendations concerning the future disposition of the remains and any associated grave goods as provided in PRC Section 5097.98. Per PRC Section 5097.98, the landowner shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located, is not damaged or disturbed by further development activity until the landowner has discussed and conferred with the MLD regarding their recommendations, taking into account the possibility of multiple human remains. On federally owned land (Area II and the NASA-owned portion of Area I), NASA shall be notified and human remains and associated funerary objects shall be treated pursuant to the Native American Graves Protection and Repatriation Act and in accordance with Stipulation VIIB of the NASA Programmatic Agreement.	Less than Significant
IMPACT 4.4-5b: Would implementation of the initial activities disturb human remains, including those interred outside of formal cemeteries?	Potentially Significant	Implementation of Mitigation Measures CUL-1 through CUL-6 and CUL-18.	Less than Significant

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
4.5 Geology and Soils			
IMPACT 4.5-1a: Would implementation of the overall site cleanup result in the exposure of people or structures to potential substantial adverse effects including the risk of loss, injury, or death involving: • Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? • Strong seismic ground shaking? • Seismic-related ground failure, including liquefaction? • Landslides?	Potentially Significant	Implementation of Mitigation Measures GEO-1 and HYDRO-1. **Mitigation Measure GEO-1:** Geotechnical Evaluation. Prior to commencement of cleanup activities, site-specific geotechnical evaluations shall be developed, by the RPs, under the direction of DTSC, in accordance with applicable regulations. Each geotechnical evaluation shall be prepared by a registered geotechnical engineer and approved prior to implementation. DTSC shall work with Ventura County to facilitate review and approval as necessary, based on the scope of the investigation. Specific measures to reduce the potential physical hazards associated with strong seismic ground shaking, liquefaction, subsidence, unstable soil conditions, temporary slopes and excavations, permanent slopes, and other earthwork-related conditions during cleanup shall be recommended in the report and implemented by the RPs.	Less than Significant
IMPACT 4.5-1b: Would implementation of the initial activities result in the exposure of people or structures to potential substantial adverse effects including the risk of loss, injury, or death involving: • Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? • Strong seismic ground shaking? • Seismic-related ground failure, including liquefaction? • Landslides?	Potentially Significant	Implementation of Mitigation Measures GEO-1 and HYDRO-1.	Less than Significant
IMPACT 4.5-2a: Would implementation of the overall site cleanup result in substantial soil erosion or the loss of topsoil?	Potentially Significant	Implementation of Mitigation Measures AQ-4, BIO-5, GEO-1 and HYDRO-1.	Less than Significant
IMPACT 4.5-2b: Would implementation of the initial activities result in substantial soil erosion or the loss of topsoil?	Potentially Significant	Implementation of Mitigation Measures AQ-4, BIO-5, GEO-1 and HYDRO-1.	Less than Significant
IMPACT 4.5-3a: Would the overall site cleanup be located on a geologic unit that is unstable or includes soil that is unstable, or that would become unstable as a result of project implementation, and result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?	Potentially Significant	Implementation of Mitigation Measures GEO-1, BIO-5, HYDRO-1, and AQ-4.	Less than Significant
IMPACT 4.5-3b: Would the initial activities be located on a geologic unit that is unstable or includes soil that is unstable, or that would become unstable as a result of project implementation, and result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?	Potentially Significant	Implementation of Mitigation Measures GEO-1, BIO-5, HYDRO-1, and AQ-4.	Less than Significant

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
IMPACT 4.5-4a: Would the overall site cleanup be located on expansive soil and could create substantial risks to life or property?	Potentially Significant	Implementation of Mitigation Measures GEO-1.	Less than Significant
IMPACT 4.5-4b: Would the initial activities be located on expansive soil and could create substantial risks to life or property?	Potentially Significant	Implementation of Mitigation Measures GEO-1.	Less than Significant
4.6 Greenhouse Gas			
IMPACT 4.6-1a: Would the overall site cleanup generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?	Potentially Significant	Implementation of Mitigation Measures AQ-5, Trans-1, EC-1, EC-2, and GHG-1 through GHG-3. **Mitigation Measure GHG-1:** Recycling Requirement. To the maximum practical extent, recyclable materials, including non-hazardous debris, shall be reused or recycled. **Mitigation Measure GHG-2:** On-Road Vehicle Fleet Requirements. The RPs (and their contractors), under the direction of DTSC, shall use trucks that are model year 2014 or newer or are certified to meet the emissions standards of a 2014 or newer on-road diesel heavy-duty vehicle. A copy of each unit's certified tier specification, BACT documentation, and CARB or SCAQMD operating permit shall be provided at the time of mobilization of each applicable unit of equipment. This requirement must be included in bid documents with the appropriate contractors and subcontractors. **Mitigation Measure GHG-3:** Greenhouse Gas Emissions Reduction Plan. Before physical implementation of the project begins, the RPs, under the direction of DTSC, shall develop and implement a Greenhouse Gas Emissions Reduction Plan (GHG Plan) containing feasible strategies to reduce GHG emissions for the project to a less-than-significant level. As part of the GHG Plan, the RPs, under the direction of DTSC, shall require contractors implementing the cleanup activities to track hours, miles, fuel usage, or other suitable surrogate parameters related to the cleanup and calculate and report the resultant GHG emissions every month. Based on information obtained through this tracking system, the plan shall require the RPs, under the direction of DTSC, to implement, as needed, specifically identified measures to ensure that the project would not exceed, on a 12-month rolling basis, the threshold 10,000 MTCO2e. The measures shall include, but not be limited to, one or more of the following: • Seek opportunities for California forest preservation and the planting of new drought-tolerant, high-carbon sequestering, and/or native trees of appropriate size and type for properties in California, including in disadvantaged communities or land uses such as parks serving disadvantaged communities either onsite or offsite in Ventura County, Los Angeles County, or other counties where project-related emissions occur, that would result in a net sequestration of CO2 emissions. • Seek opportunities for offsetting GHG emissions from existing sources, including sources located in disadvantaged communities or sources serving disadvantaged communities in Ventura County, Los Angeles County, or other counties where project-related emissions occur. Examples may include but are	Less than Significant

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		not limited to implementing methane capture and destruction programs at dairy farms, coordinating with local transportation agencies and property owners and establishing electric vehicle supply equipment (EVSE) at park-and-ride lots or other appropriate locations, coordinating with local transportation agencies and school districts and replacing diesel- or gasoline-fueled buses with less-polluting technologies such as compressed natural gas, electric, hybrid-electric, fuel cell, or other commercially available technologies, or other GHG emissions offset programs. • Review, at least once a year, commercial availability of alternatives to diesel-powered on-road and off-road equipment. If commercially available in the region, contractors shall be required to use equipment capable of performing the cleanup activities in a comparable manner (with respect to time, safety, equipment power requirements, etc.), which results in appreciable GHG reductions. • Purchase carbon credits from a reputable carbon market. Priority should be given to those credits generated within the vicinity of SSFL, and in decreasing preference, credits generated within the region, in-state, and out-of-state. The plan shall devise mitigation with a priority on fiscal considerations in order to reserve project funds, to the extent feasible, for actual cleanup activities. The plan may also include provisions to seek grant funding or other mechanisms to leverage other existing programs that address energy reduction or urban forestation.	
IMPACT 4.6-1b: Would the initial activities generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?	Potentially Significant	Implementation of Mitigation Measures AQ-5, TRANS-1, EC-1, EC-2, and GHG-1 through GHG-3.	Less than Significant
IMPACT 4.6-2a: Would the overall site cleanup conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHG?	Less than Significant	No mitigation is required.	N/A
IMPACT 4.6-2b: Would the initial activities conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHG?	Less than Significant	No mitigation is required.	N/A

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
4.7 Hazards and Hazardous Materials			
IMPACT 4.7-1a: Would implementation of the overall site cleanup create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Potentially Significant	Implementation of Mitigation Measures TRANS-1, HAZ-2, and HAZ-5. **Mitigation Measure HAZ-2:** Hazardous Materials Containment. To ensure appropriate containment of excavated materials that exceed state or federal hazardous waste criteria, such materials shall be placed in lined, sealed containers or wrapped and enclosed by tarps and transported by licensed hazardous waste haulers and disposed of at a licensed hazardous waste management facilities approved for the specific hazardous materials to be disposed of. **Mitigation Measure HAZ-5:** Transport of Radiological Material. To limit radioactive exposure to sensitive uses, the number of annual truck trips transporting low-level radioactive waste (LLRW) and mixed low-level radioactive waste (MLLRW) would be limited to 2,080 trips on an annual basis or an average of eight trucks per day.	Less than Significant
IMPACT 4.7-1b: Would implementation of initial activities create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Potentially Significant	Implementation of Mitigation Measures TRANS-1, HAZ-2, and HAZ-5.	Less than Significant
IMPACT 4.7-2a: Would implementation of the overall site cleanup create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	Potentially Significant	Implementation of Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1. **Mitigation Measure HAZ-1:** Health and Safety Plan. A Health and Safety Plan (HSP) shall be developed and implemented for the proposed activities and will include the following: • General hazard controls • Monitoring requirements • Project-specific hazard controls such as asbestos, lead-based paint, and earthmoving equipment • Traffic control • Physical hazard controls such as noise and temperature extremes • Biological hazard controls Designated areas for chemical storage and handling shall be identified. The plan shall be reviewed for the project activities and shall include procedures to mitigate potential hazards, measures that provide protection from physical hazards, measures that provide protection from chemical hazards that might be present at the site, decontamination procedures, and worker and health and safety monitoring criteria to be implemented during project activities, if needed. Per 29 CFR Part 1910, Hazardous Waste Operations and Emergency Response Standard, safety training for site workers must be met in order to conduct cleanup or emergency response operations. Associated worker safety training shall occur before ground-disturbing activities began. Work zones shall be marked clearly with barricades or construction fencing to control unauthorized access to the	Significant and Unavoidable

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		areas. In addition, if dust or chemical monitoring is required during demolition or during soil and groundwater cleanup operations, it will be implemented according to the site-specific HSP, which will list the proper action limits at which controls shall be required. **Mitigation Measure HAZ-3:** Hazardous Materials Business Plan. As required by California Health and Safety Code Chapter 6.95 and the California Code of Regulations, Title 19, a Hazardous Materials Business Plan shall be developed by each RP for their respective areas. These plans shall describe appropriate storage, containment, and safety protocols for use of hazardous materials during the remediation; emergency procedures to be followed in the event of a release; instructions for performing fueling and maintenance operations on vehicles and equipment onsite; and other protocols so that hazardous materials shall be stored and handled appropriately.	
IMPACT 4.7-2b: Would implementation of the initial activities create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	Potentially Significant	Implementation of Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1.	Less than Significant
IMPACT 4.7-3a: Would the overall site cleanup emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one quarter mile of an existing or proposed school?	Potentially Significant	Implementation of Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HAZ-5, and TRANS-1.	Less than Significant
IMPACT 4.7-3b: Would the initial activities emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one quarter mile of an existing or proposed school?	Potentially Significant	Implementation of Mitigation Measures HAZ-1, HAZ-2, HAZ-3,HAZ-5, and TRANS-1.	Less than Significant
IMPACT 4.7-4a: Would implementation of the overall site cleanup impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	Potentially Significant	Implementation of Mitigation Measure TRANS-1.	Less than Significant
IMPACT 4.7-4b: Would implementation of the initial activities impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	Potentially Significant	Implementation of Mitigation Measure TRANS-1.	Less than Significant
IMPACT 4.7-5a: Would implementation of overall site cleanup expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	Potentially Significant	Implementation of Mitigation Measures HAZ-1, HAZ-3, and HAZ-4. **Mitigation Measure HAZ-4:** Fire Management Plan. A Fire Management Plan shall be prepared for proposed cleanup, demolition, soil and debris hauling, monitoring, and maintenance activities located at the project site and along proposed haul routes in High Fire Severity Zones. The plan shall include but not be limited to the following: • The name and contact information of a Fire Control Coordinator who shall be assigned to the project. • A list of numbers to call in case of a fire, including 911 (or the equivalent in	Less than Significant

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		the area). • Alternative communication methods for areas of the site that do not have reliable cellular phone service. • A complete list, including storage locations, of all tools and equipment the Contractor will use in the event of a fire within project limits. • Methods that shall be employed if a fire is encountered or started during activities within the project limits. • Specific fire prevention precautions, and the required firefighting equipment, for activities that have the potential for starting a fire. At a minimum, the plan shall address prevention planning related to use of heavy equipment, vehicles, flammable chemicals and gases, hand tools, storage, and parking areas. • Provisions for field safety meetings. The Contractor shall conduct field safety meetings (also known as toolbox or tailgate meetings) daily. The Contractor shall require participation by all persons working at the project site. Participants shall discuss specific fire prevention precautions for construction activities. All provisions of the plan shall be applicable to cleanup crews and activities and monitoring/maintenance crews and activities.	
IMPACT 4.7-5b: Would implementation of initial activities expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	Potentially Significant	Implementation of Mitigation Measures HAZ-1, HAZ-3, and HAZ-4.	Less than Significant
IMPACT 4.7-6a: Would implementation of the overall site cleanup create a significant hazard to the public or the environment through the presence of chemical amendments for the treatment of chemicals in soil and/or groundwater?	Potentially Significant	Implementation of Mitigation Measures HAZ-4, HYDRO-1, and HYDRO-2.	Less than Significant
IMPACT 4.7-6b: Would implementation of the initial activities create a significant hazard to the public or the environment through the presence of chemical amendments for the treatment of chemicals in soil and/or groundwater?	Less than Significant	No mitigation is required.	N/A
IMPACT 4.7-7a: Would implementation of the overall site cleanup would be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment?	Potentially Significant	Implementation of Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1.	Significant and Unavoidable

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
IMPACT 4.7-7b: Would implementation of the initial activities would be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment?	Potentially Significant	Implementation of Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1.	Less than Significant
4.8 Hydrology and Water Quality			
IMPACT 4.8-1a: Would implementation of the overall site cleanup violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality?	Potentially Significant	Implementation of Mitigation Measures AQ-3, BIO-5, HAZ-3, HYDRO-1, and HYDRO-2 **Mitigation Measure HYDRO-1:** Stormwater Pollution Prevention Plan (SWPPP). Site activities shall take place in accordance with the statewide General Permit for Stormwater Discharges Associated with Construction Activity (Order No. 2009-0009-DWQ [NPDES No. CAS000002]). As required by this permit and prior to implementation of remediation activities, the RPs shall submit a Notice of Intent, followed by submission of a SWPPP to the LARWQCB for their review. The SWPPP would specify site-specific BMPs to address and protect stormwater runoff and to minimize erosion during cleanup activities. The BMPs typically include silt fences, sand bags, straw waddles, fiber rolls, stockpile management, spill prevention and control, dewatering runoff controls, containment for chemical storage areas, equipment decontamination procedures, and the use of protective sheeting or tarps prior to a rain event on steep slopes. BMPs shall minimize erosion from destabilization of disturbed surfaces. The RPs shall continue monitoring drainages for increased sediment load and contaminants in accordance with the existing NPDES Permit No. CA0001309 (also referred to under LARWQCB Order R4-2015-0033) during each RP's remediation activities. **Mitigation Measure HYDRO-2:** Operations and Maintenance Plan (O&M Plan). To monitor the effectiveness of the implemented remedial actions, groundwater, surface water, and soil monitoring shall be performed consistent with a DTSC-approved O&M Plan. The groundwater-monitoring portion of the O&M Plan shall consist of monitoring and sampling of wells. New monitoring wells shall be constructed in accordance with the California DWR Well Standards Bulletin 74-90, Ventura County Well Ordinance 4184, and the 2014 DTSC Well Design and Construction for Monitoring Groundwater at Contaminated Sites. Reports shall be prepared and submitted to DTSC that present the monitoring and sampling results and, as necessary, recommendations for modifications to the monitoring program, or additional remedial actions. Post-remediation monitoring requirements for soil corrective actions may consist of periodic inspections to monitor permanent caps or covers (if used) and periodic sampling to assess soil concentrations following natural degradation processes (if selected).	Less than Significant

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
IMPACT 4.8-1b: Would implementation of the initial activities violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality?	Potentially Significant	Implementation of Mitigation Measures AQ-3, BIO-5, HYDRO-1, HYDRO-2, and HAZ-3.	Less than Significant
IMPACT 4.8-2a: Would implementation of the overall site cleanup substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted) ?	Less than Significant	No mitigation is required.	N/A
IMPACT 4.8-2b: Would implementation of the initial activities substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted) ?	Less than Significant	No mitigation is required.	N/A
IMPACT 4.8-3a: Would implementation of the overall site cleanup substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?	Potentially Significant	Implementation of Mitigation Measures BIO-5, BIO-21, HYDRO-1, and HYDRO-2.	Less than Significant
IMPACT 4.8-3b: Would implementation of the initial activities substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?	Potentially Significant	Implementation of Mitigation Measures BIO-5, BIO-21, HYDRO-1, and HYDRO-2.	Less than Significant
IMPACT 4.8-4a: Would implementation of the overall site cleanup substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite?	Potentially Significant	Implementation of Mitigation Measure BIO-21.	Less than Significant
IMPACT 4.8-4b: Would implementation of the initial activities substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite?	Potentially Significant	Implementation of Mitigation Measure BIO-21.	Less than Significant

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
IMPACT 4.8-5a: Would implementation of the overall site cleanup create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	Potentially Significant	Implementation of Mitigation Measures BIO-5, BIO-21, HYDRO-1, and HYDRO-2.	Less than Significant
IMPACT 4.8-5b: Would implementation of the initial activities create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	Potentially Significant	Implementation of Mitigation Measures BIO-5, HYDRO-1, and HYDRO-2.	Less than Significant
4.9 Land Use and Planning			
IMPACT 4.9-1a: Would implementation of the proposed overall site cleanup conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect?	Potentially Significant	Implementation of Mitigation Measures AQ-3, BIO-1 through BIO-23, HYDRO-2, HYDRO-2, HAZ-3, and NOISE-1.	Significant and Unavoidable
IMPACT 4.9-1b: Would implementation of the proposed initial activities conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect?	Potentially Significant	Implementation of Mitigation Measures AQ-3, BIO-1 through BIO-23, HYDRO-2, HYDRO-2, HAZ-3, and NOISE-1.	Significant and Unavoidable
4.10 Noise			
IMPACT 4.10-1a: Would implementation of the overall site cleanup result in exposure of persons to or the generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies?	Potentially Significant	Implementation of Mitigation Measure NOISE-1. **Mitigation Measure NOISE-1:** Cleanup activities within 1,000 feet of the northern boundary of Area I shall be prohibited between the hours of 7:00 p.m. to 7:00 a.m. Monday through Friday, and from 7:00 p.m. to 9:00 a.m., Saturday, Sunday, and local holidays. Figure 4.10-4 shows the location of the 1,000-foot nighttime avoidance area.	Less than Significant
IMPACT 4.10-1b: Would implementation of the initial activities result in exposure of persons to or the generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies?	Less than Significant	No mitigation is required.	N/A
IMPACT4.10-2a: Would implementation of the overall site cleanup result in exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?	Less than Significant	No mitigation is required.	N/A
IMPACT4.10-2b: Would implementation of the initial activities result in exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?	Less than Significant	No mitigation is required.	N/A

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
IMPACT 4.10-3a: Would implementation of the overall site cleanup result in a temporary/periodic or substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	Potentially Significant	Implementation of Mitigation Measures NOISE-2 and NOISE-3. **Mitigation Measure NOISE-2:** Temporary noise barriers shall be used, as feasible, to block the line-of-site between the Sage Ranch Park ranger's house and campsites (located north of Area I). The height of the noise barriers must be sufficient to block the line-of-sight. **Mitigation Measure NOISE-3:** Temporary noise barriers shall be used, as feasible, to block the line-of-site between the hauling trucks and noise sensitive receivers along Woolsey Canyon Road and Facility Road. The noise barrier height must be sufficient to block the line-of-sight.	Significant and Unavoidable
IMPACT 4.10-3b: Would implementation of the initial activities result in a temporary/periodic or substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	Potentially Significant	Implementation of Mitigation Measure NOISE-3.	Significant and Unavoidable
4.11 Transportation and Traffic			
IMPACT 4 .11-1a: Would implementation of the overall site cleanup conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	Potentially Significant	Implementation of Mitigation Measure TRANS-1. **Mitigation Measure TRANS-1:** Site-Wide Traffic Management Plan. Prior to the beginning of remediation activities, the RPs, shall prepare a comprehensive Site-Wide Traffic Management Plan that identifies common traffic-control requirements for onsite deliveries and offsite hauling to facilitate safe and efficient traffic flow within SSFL and on public roadways. This plan shall be submitted to DTSC for review. The criteria for haul routes shall avoid direct routing through sensitive habitat areas and areas with residential dwellings, schools, and bike routes unless no alternative is available. The Plan shall establish, list, and map the trucking routes, days and hours of truck operation, maximum number of trucks per day, and various requirements to provide traffic, pedestrian, and bicycle safety. Truck operators shall be provided with a trucking route map and hours of operation allowed. The Plan shall designate an onsite coordinator for project activities. The Plan shall provide specific traffic-control measures, signs, and delineators to be implemented by the construction contractor(s) through the duration of cleanup activities. In addition, the RPs, under the direction of DTSC, shall be responsible for funding and overseeing trip reduction programs and strategies. At a minimum, the Plan shall include, but would not be necessarily limited to, the following elements: • Limit use of public roads by trucks associated with the remediation activities under the proposed project to off-peak traffic hours (i.e., hours between the end of the a.m. peak traffic hour and the start of the p.m. peak hour). • Limit truck activity associated with the remediation activities under the proposed project to weekdays (Monday through Friday) only.	Significant and Unavoidable

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Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation

		• Install either a signed/striped crosswalk with warning lights or a temporary traffic signal at the intersection of Roscoe Boulevard/Hillary Drive to provide improved safety for crossing pedestrians.
		• Install warning signs that state: "Truck activity ahead. Bicyclists use caution or alternative route;" this way bicycle riders on the segment of Valley Circle Boulevard between Roscoe Boulevard and Lake Manor Drive would be made aware of the presence of the trucking operations.
		• Alert project contractors/truck drivers to the presence of bicyclists on area roadways, particularly on the 1.1 mile segment of Valley Circle Boulevard between Woolsey Canyon Road and Roscoe Boulevard.
		• As feasible, Boeing shall use backfill material from borrow areas located in the Southern Undeveloped Area of the SSFL site.
		• To reduce the overall number of trucks traveling to and from the site, as feasible, trucks used to haul contaminated soil away from the site shall arrive at the site loaded with clean backfill.
		• Funding and/or overseeing the following trip reduction programs or strategies:
		  - Establishment of carpool, buspool, or vanpool programs
		  - Cash allowances, passes, or other public transit subsidies and purchase incentives.
		• Computerized commuter rideshare matching services.	

IMPACT 4.11-1b: Would implementation of the initial activities conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	Potentially Significant	Implementation of Mitigation Measure TRANS-1.	Significant and Unavoidable
IMPACT 4.11-2a: Would implementation of the overall site cleanup substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	Potentially Significant	Implementation of Mitigation Measures TRANS-1 and TRANS-2. **Mitigation Measure TRANS-2:** Public Roadway Repair. The RPs, under the direction of DTSC, shall be responsible for restoring all public roads, easements, rights-of-way (ROWs) and infrastructure (such as signs, utility poles, etc.) within the public road ROWs that have been damaged from project-related activities or traffic through implementation of a Road Restoration Plan. Restoration shall be to original or near-original pre-project condition and undertaken in a timely manner, in consultation and to the satisfaction of the City of Los Angeles, County of Los Angeles, City of Simi Valley, County of Ventura, and Caltrans, as appropriate. At a minimum, the RPs shall:	Less than Significant

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		• Provide a video log of the proposed haul route. • Determine the current Pavement Condition Index (PCI) of the haul route roadways. • Propose locations to place traffic axle counters to measure project-related traffic. • Identify the funding mechanism for identified roadway maintenance. The RPs shall be responsible for all costs. • Identify the frequency (semi-annual or annual) of road inspections during remediation activities and a mechanism for investigating complaints related to substantial road damage. At least 30 days prior to the start of cleanup activities, the RPs, under the direction of DTSC, shall establish baseline road conditions by photographing, videotaping, or otherwise documenting existing conditions of all affected public roads, easements, ROW segment(s), and intersections, and shall provide the City of Los Angeles, County of Los Angeles, City of Simi Valley, County of Ventura, and Caltrans (if applicable) a copy of these documents. Prior to the start of remediation activities, the RPs, under the direction of DTSC, shall enter into a Roadway Repair Agreement with the City and County Public Works Departments in a form of documentation acceptable to each agency, secure an Encroachment Permit, and post a cash damage bond. Prior to DTSC certification that each RP has completed its portion of cleanup activities, the RPs shall meet with the City of Los Angeles, County of Los Angeles, City of Simi Valley, County of Ventura, and Caltrans (if applicable) to review the baseline road conditions and identify sections of public ROW that may have been damaged by project activities. At that time (prior to DTSC certification that each RP has completed its portion of cleanup activities), the RPs shall establish a schedule to complete the repairs or compensate the City of Los Angeles, County of Los Angeles, City of Simi Valley, County of Ventura, or Caltrans in accordance with the Roadway Repair Agreement. Following completion/compensation of the identified public ROW repairs, the RPs shall provide a letter to DTSC from affected jurisdictions (City of Los Angeles Department of Transportation, County of Los Angeles Department of Public Works, City of Simi Valley Department of Public Works, County of Ventura Public Works Agency, and Caltrans) stating their satisfaction with the repairs/compensation. Compliance with monitoring plans shall be verified by DTSC, in consultation with the City and County of Los Angeles, City of Simi Valley, County of Ventura, and Caltrans.	
IMPACT 4.11-2b: Would implementation of initial activities substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment?	Potentially Significant	Implementation of Mitigation Measures TRANS-1 and TRANS-2.	Less than Significant

TABLE 1-8
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
IMPACT 4.11-3a: Would implementation of the overall site cleanup result in inadequate emergency access?	Potentially Significant	Implementation of Mitigation Measure TRANS-1.	Less than Significant
IMPACT 4.11-3b: Would implementation of the initial activities result in inadequate emergency access?	Potentially Significant	Implementation of Mitigation Measure TRANS-1.	Less than Significant
4.12 Utilities and Service Systems			
IMPACT 4.12-1a: Would implementation of the overall site cleanup be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	Less than Significant	No mitigation is required.	N/A
IMPACT 4.12-1b: Would implementation of the initial activities be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	Less than Significant	No mitigation is required.	N/A
IMPACT 4.12-2a: Would the overall site cleanup comply with federal, state, and local statutes and regulations related to solid waste?	Less than Significant	No mitigation is required.	N/A
IMPACT 4.12-2b: Would the initial activities comply with federal, state, and local statutes and regulations related to solid waste?	Less than Significant	No mitigation is required.	N/A
4.13 Energy			
IMPACT 4.13-1a: Would the overall site cleanup result in the inefficient use of energy resources?	Potentially Significant	Implementation of Mitigation Measures AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, TRANS 1, EC-1, and EC-2. **Mitigation Measure EC-1:** Energy Conservation - New Onsite Facilities. The following measures shall be implemented by the RPs, under the direction of DTSC, to conserve electricity for new onsite facilities to be used for office functions (assumed to be trailers or other prefabricated non-permanent structures) by the RPs or their contractors for administration of cleanup activities: • Exterior walls on all temporary office buildings shall be insulated and be equipped with Energy Star® rated double-paned insulated glass windows. • Exterior doors on temporary office buildings shall be solid core insulated and sealed with weather stripping. • White reflective roofing or covering shall be included on all temporary office buildings. • LED light bulbs shall be used for project office lighting and outdoor office security lighting, as appropriate. • Dusk-to-dawn outdoor sensors and/or motion activated sensors shall be used for all outdoor project security lighting, as appropriate.	Less than Significant

TABLE 1-8
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		• Motion-activated light switches or automatic shut-off timers shall be used for all indoor project office lighting. • All refrigerators and other kitchen appliances used onsite for the project shall be Energy Star® rated, as applicable. • Offices shall include programmable thermostats with occupancy sensors that shut off the HVAC system when vacant. **Mitigation Measure EC-2:** Energy Conservation – New Onsite Equipment. The following measures shall be implemented by the RPs, under the direction of DTSC, to conserve electricity for new equipment that would be used for project activities: • The newest commercially available models for all pumps, vacuums, and blowers shall be used to implement soil vapor extraction/air sparging, bioventing, and gaseous electron donor injection. • Pumps, vacuums, and blowers used to implement soil vapor extraction/air sparging, bioventing, and gaseous electron donor injection shall be sized such that smallest specified horsepower or kilo wattage is used, as appropriate.	
IMPACT 4.13-1b: Would the initial activities result in the inefficient use of energy resources?	Potentially Significant	Implementation of Mitigation Measures AQ-1, AQ-5, GHG-1through GHG-3 and TRANS-1.	Less than Significant
IMPACT 4.13-2a: Would the overall site cleanup increase transportation energy use requirements?	Potentially Significant	Implementation of Mitigation Measures AQ-1, AQ-5, GHG-1through GHG-3 and TRANS-1.	Less than Significant
IMPACT 4.13-2b: Would the initial activities increase transportation energy use requirements?	Potentially Significant	Implementation of Mitigation Measures AQ-1, AQ-5, GHG-1through GHG-3 and TRANS-1.	Less than Significant
IMPACT 4.13-3a: Would the overall site cleanup increase demand (including peak and base period demands) on local and regional energy supplies that result in the need for additional capacity?	Less than Significant	No mitigation is required.	N/A
IMPACT 4.13-3b: Would the initial activities increase demand (including peak and base period demands) on local and regional energy supplies that result in the need for additional capacity?	Less than Significant	No mitigation is required.	N/A
IMPACT 4.13-4a: Would the overall site cleanup conflict with existing energy standards, policies and regulations?	Less than Significant	Implementation of Mitigation Measures AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, TRANS-1, EC-1, and EC-2.	Less than Significant
IMPACT 4.13-4b: Would the initial activities conflict with existing energy standards, policies and regulations?	Less than Significant	Implementation of Mitigation Measures AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, TRANS-1, EC-1, and EC-2.	Less than Significant

CHAPTER 2
Introduction

This Draft Program Environmental Impact Report (PEIR) has been prepared for the California Department of Toxic Substances Control (DTSC), in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code (PRC), Section 21000 et seq.; California Code of Regulations (CCR), Title 14, Chapter 3, Section 15000 et seq. [CEQA Guidelines]), to evaluate the potentially significant environmental effects associated with soil and groundwater remediation activities and other activities associated with the termination of operations (proposed project or project) at the Santa Susana Field Laboratory (SSFL or project site), located in the Simi Hills between Simi Valley and Los Angeles, California (see **Figure 2-1**).

The selection and approval of final corrective actions to remediate the contaminated media at SSFL is a discretionary decision made by DTSC. Activities associated with the corrective action may result in direct or indirect changes in the physical environment. Therefore, this project is subject to environmental analysis under CEQA. Pursuant to CEQA Guidelines Section 15367, DTSC is the CEQA lead agency for the proposed project. The proposed project being evaluated under CEQA, which is the subject of this PEIR, is the cleanup (i.e., remediation) of SSFL contaminated soils and groundwater. The cleanup includes "corrective action," as defined under the Resource Conservation and Recovery Act (RCRA), and under State Superfund Authority, specifically Chapter 6.8 of Division 20 of the California Health and Safety Code (the Hazardous Substances Act, Sections 25300 et seq. of that Code). DTSC is implementing these laws at SSFL under the 2007 Consent Order and the 2010 Administrative Orders on Consent (AOCs). The Program Management Plan (PMP), included as **Appendix A** of this PEIR, further describes how the 2007 Consent Order and 2010 AOCs would be implemented.

In California, DTSC implements RCRA under delegated authority from the U.S. Environmental Protection Agency (USEPA) through state law, specifically Chapter 6.5 of Division 20 of the California Health and Safety Code (the California Hazardous Waste Control Law, Sections 25100 et seq. of that Code). In addition, the cleanup of soil by the federal agencies—the Department of Energy (DOE) and National Aeronautics and Space Administration (NASA)—is conducted under the California Health & Safety Code Section 25356.1 in the Hazardous Substances Account Act. DTSC applies the USEPA's Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process regarding contaminated site investigations and cleanups. The CERCLA process requires evaluation of the proposed cleanup actions against specific criteria, and the SSFL cleanup actions will be evaluated against the criteria provided in Section 3.5.

Within these regulations, cleanup at the project site is further defined in the 2007 Consent Order for Corrective Action (2007 Consent Order) (DTSC, 2007) and the 2010 AOCs for Remedial Action (DTSC, 2010a; 2010b). The 2007 Consent Order is the initial agreement that DTSC and the Responsible Parties (RPs)—Boeing, NASA, and DOE—entered into to define the requirements for investigation of contamination in soil and groundwater, and to implement the associated cleanup at SSFL. In 2010, NASA and DOE entered into the subsequent, separate 2010 AOCs, with DTSC, to further define obligations regarding the investigation and cleanup of soil within NASA's and DOE's areas of responsibility. The 2010 AOCs do not affect the 2007 Consent Order requirements for groundwater or the soil within Boeing's areas of responsibility. Groundwater for all of SSFL, and soil within Boeing's administrative areas, continue to be regulated by the 2007 Consent Order.

This introductory chapter provides: (1) the purpose of this PEIR; (2) background information related to the proposed project and the SSFL site; (3) agency roles and responsibilities; (4) an overview of the environmental review process; (5) the scope of this PEIR; and (6) the organization of this PEIR.

2.1 Purpose of the PEIR

This PEIR was prepared by independent consultants retained by DTSC for purposes of assessing the potential environmental impacts that may arise in connection with actions related to approval and implementation of this proposed project by California public agencies, as required under CEQA. This PEIR is intended to identify the environmental impacts of the project and to address the potentially significant adverse effects of the project on the physical environment.

2.1.1 Combined Program- and Project-Level Analysis

An Environmental Impact Report (EIR) is an informational document that is intended to inform regulatory agency decision makers and the public of the environmental effects of a project (in this instance, the selection of cleanup remedies and the areas to which those remedies are applied) and any potential measures to mitigate, reduce, or avoid significant impacts as required under CEQA. It also discusses alternatives to the proposed project that could feasibly attain most of the basic objectives of the project, while substantially reducing or avoiding significant environmental impacts.

CEQA authorizes lead agencies to prepare a program-level analysis for approval of a series of actions that are related geographically or as part of a suite of activities (CEQA Guidelines Section 15168). By contrast, a project-level analysis evaluates a specific discretionary action that may result in significant environmental effects (CEQA Guidelines Section 15161).

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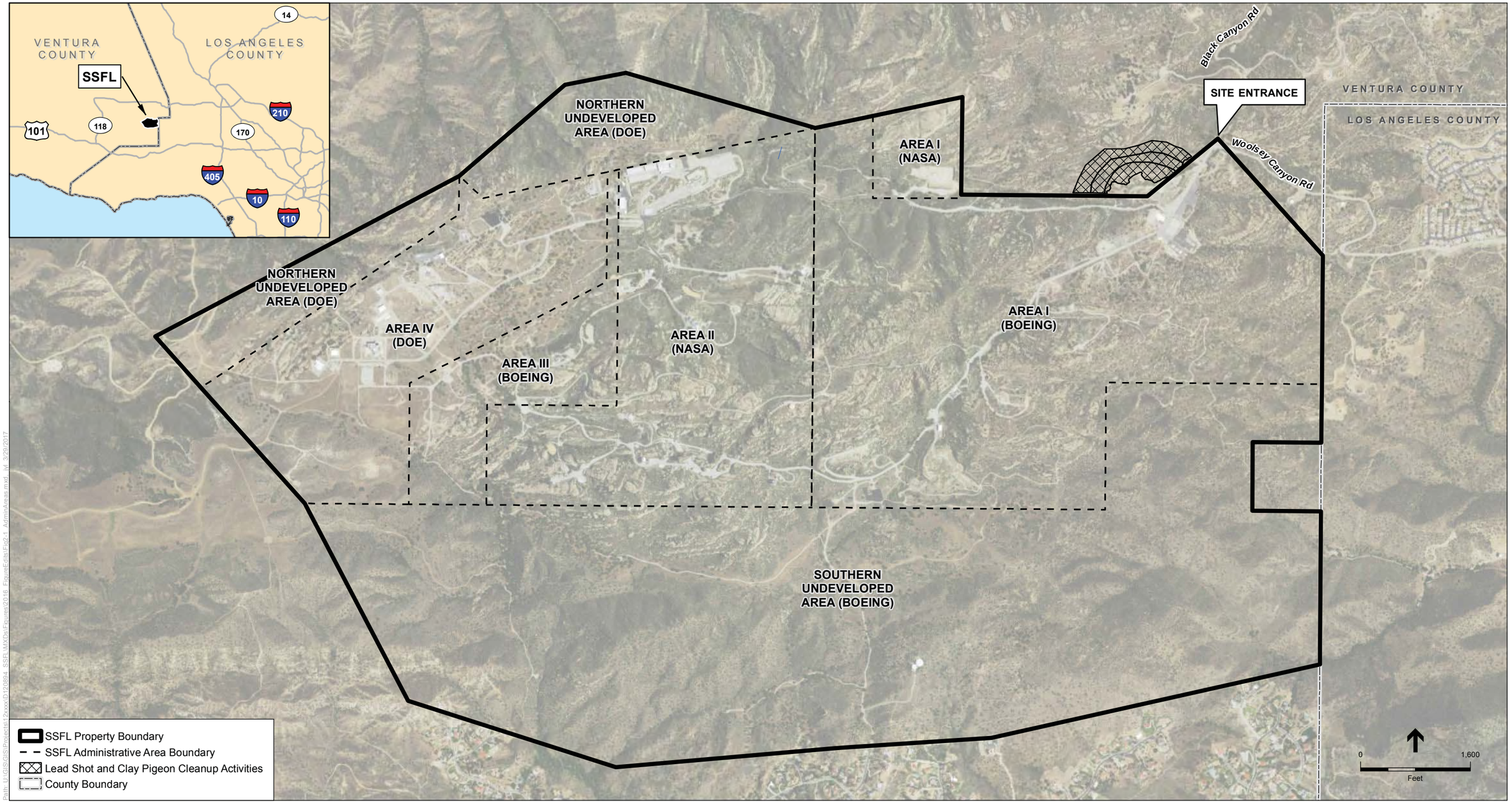

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SOURCE: ESA; ESRI; Boeing 2016; MWH 2016

Santa Susana Field Laboratory. 120894

Figure 2-1

Administrative Areas

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As defined by CEQA Guidelines Section 15168, a PEIR is an EIR that may be prepared on a series of actions that can be characterized as one large project and are related in any of the following ways:

- Geographically (the SSFL site and adjacent areas contaminated by SSFL activities).
- As logical parts in the chain of contemplated actions (cleanup of contaminated media).
- In connection with rules, regulations, plans, or other general criteria to govern the conduct of a continuing program (2007 Consent Order and 2010 AOCs).
- As individual activities carried out under the same authorizing statutory or regulatory authority (the DTSC) and having generally similar environmental effects that can be mitigated in similar ways.

This PEIR provides a program-level analysis of the various conceptual remediation technologies and corrective actions that would be employed at the project site to remediate impacted groundwater and soil. The remediation technologies and corrective actions evaluated in this PEIR are based on available investigation and characterization documents[1] that have been prepared to date; these delineate the nature and extent of the contaminated media. In addition, the RPs have conducted treatability studies to evaluate various remediation technologies that could be applied to the contaminated media.

After completion of the investigation and characterization documents and treatability studies, each RP will prepare draft cleanup decision documents[2] to propose specific corrective actions for their respective areas of responsibility. DTSC would evaluate the draft proposed specific corrective actions and then prepare the draft cleanup decision and make the cleanup decision documents available for public comment. After the close of the public comment period and considering public comment, DTSC will select and approve the cleanup decision document for implementation. Corrective Measures Implementation Workplans (for soil in Boeing areas of responsibility and site-wide groundwater) would be prepared to implement the cleanup activities consistent with the 2007 Consent Order. For soils in NASA and DOE areas of responsibility, implementation plans would be prepared as necessary based on and consistent with 2010 AOCs and the final content of the Soils Remedial Action Implementation Plan(s).

CEQA Guidelines Section 15161 states a project EIR "should focus primarily on the changes in the environment that would result from the development project." As stated in Section 15161 of the CEQA Guidelines, a project-specific EIR is required to "examine all phases of the project including planning, construction, and operation." A project-specific analysis has been prepared to

1 "Investigation and characterization documents" is an all-encompassing term that refers to the multitude of documents that have been prepared by the RPs, subject to approval by DTSC, to estimate the degree of site contamination, and to preliminarily describe and plan for potential cleanup options. Such documents would be evaluated by DTSC and used to inform the eventual cleanup decision documents described later in this chapter.

2 "Cleanup decision documents" includes the Corrective Measures Studies for Boeing soils cleanup and site-wide groundwater cleanup, Soils Remedial Action Implementation Plan for DOE and NASA soils cleanup, removal action plans, Closure Plans for the various permitted and interim status units, and Post-Closure Permits for the closed surface impoundments.

the extent that the available investigation and characterization documents present the information regarding the remediation technologies. While the investigation and characterization documents explain the type and extent of contamination that requires cleanup, the documents may not identify the exact type of cleanup activity(ies) (i.e., excavation, soil vapor extraction, etc.).

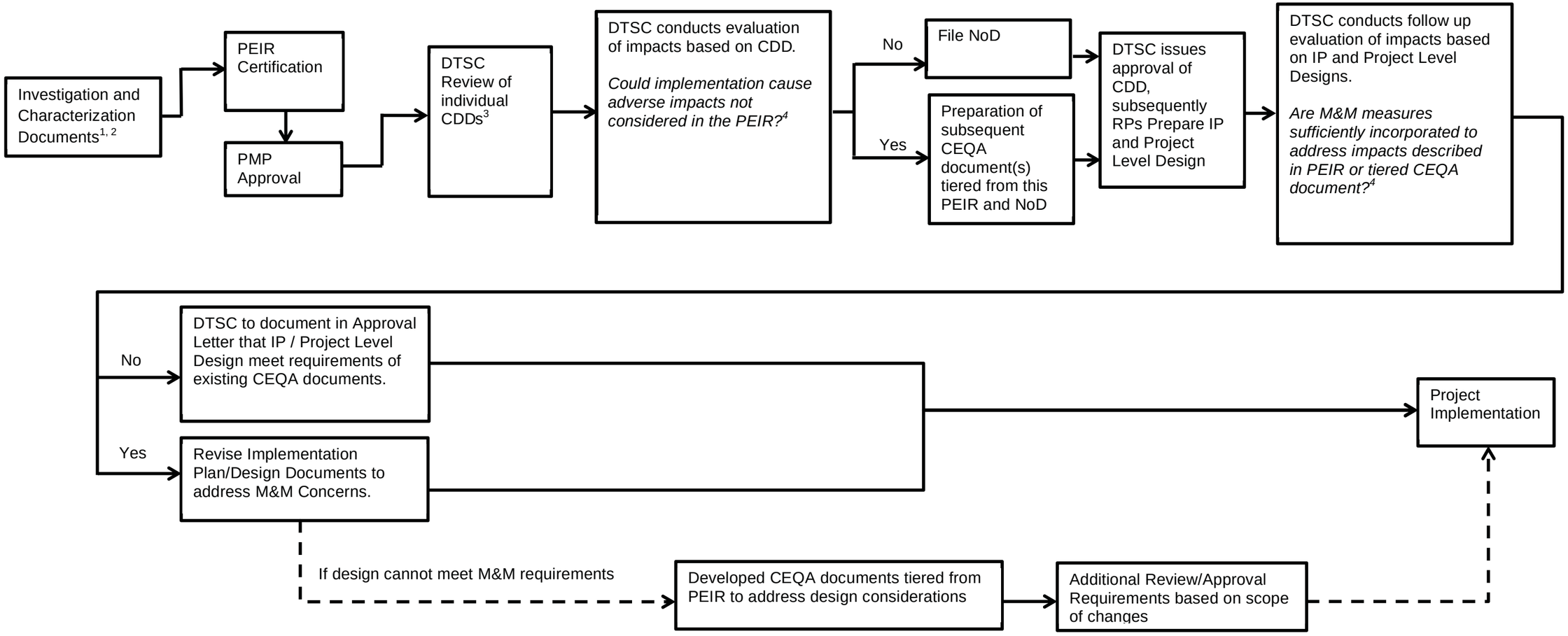
The exact type and location of project activities would not be determined until the future design phase of the project, which is planned to occur after the approval of the final remediation documents. This PEIR includes, to the extent possible regarding known activities, details of the various remediation technologies to be used at SSFL. Chapter 4.0, *Environmental Setting, Impacts and Mitigation*, of this PEIR, includes environmental assessments with a project-level analysis where the potential for project impacts is not tied to the exact location of project activities (such as wells or utilities) or where variability in the final designs or locations of these activities would not change the outcome of the impact analysis.

A PEIR is a type of EIR that allows a public agency to consider broad policy alternatives and program-wide mitigation measures at the early stages of planning. The final proposed cleanup and related infrastructure needed to complete remediation are geographically related because these activities occur in the same footprint. Thus, the combined program and project elements are appropriately analyzed at a program level and a project level of detail. This PEIR includes a dual-level analysis to ensure that the effects of developing the final cleanup, and implementation of the final cleanup, are not segmented, while recognizing that the components are at different stages of planning.

2.1.2 Future Review of Project-Level Designs

Per the CEQA Guidelines Section 15168(c), subsequent activities at SSFL must be examined in light of the PEIR to determine whether additional documentation needs to be prepared. Upon development of the final cleanup decision documents and subsequent project-level designs associated with discrete footprints within the project area, DTSC then reviews and determines whether the impacts associated with the project-level designs were adequately examined in this PEIR. If it is determined that subsequent project-level designs are not adequately examined in this PEIR, an environmental document tiered from this PEIR would be prepared. If DTSC finds that no new effects would occur, DTSC would approve the project-level designs as being within the scope of this PEIR, and no additional environmental documents would be required. **Figure 2-2** presents a decision flow chart summarizing this process that would be followed.

In addition, DTSC would also confirm that mitigation measures recommended in this PEIR are adequate to mitigate impacts of the project-level designs. In some cases, additional site-specific mitigation may be necessary when project designs become available. This PEIR evaluates these potential consequences to the extent possible and provides program-level mitigation measures and performance criteria to guide mitigation planning, as well as site-specific impact and mitigation analyses for the initial projects expected to be implemented.



1 "Investigation and characterization documents" is an all-encompassing term that refers to the multitude of documents that have been prepared by the RPs to estimate the degree of site contamination, and to preliminarily describe and plan for potential cleanup options. Such documents would be used to inform the eventual remediation planning documents described later in this chapter.

2 "Cleanup decision documents" includes the Corrective Measures Studies for Boeing soils cleanup and site-wide groundwater cleanup, Soils Remedial Action Implementation Plans for DOE and NASA soils cleanups, Closure Plans for the various permitted and interim status units, and Post-Closure Permits for the closed impoundments.

3 The approval process for the PEIR, PMP and CDDs will include a formal public input and comment period. Public input regarding Investigation and Characterization Documents, IP, and Project Level Designs will be considered on an informal and case by case basis consistent with ongoing DTSC policy at SSFL.

4 Evaluation of anticipated impacts due to implementation of CDDs, IPs and Project Level Designs will be conducted regardless of the level of analysis presented in this PEIR for project or program evaluation because this PEIR was prepared before the CDDs were completed. For all intents and purposes the project level analysis presented in this PEIR is based on the higher level of project details that were available at the time this PEIR was published. Thus, the decision to prepare subsequent CEQA documents tiered from this PEIR will be based on the evaluation of the impact analysis presented in this PEIR as compared to the anticipated impacts at each subsequent stage of project planning (ie CDD, IP, and project design) and not necessarily on the fact that the project is or is not described as an "initial project" in Chapter 3 of this document.

Acronyms List
DTSC – Department of Toxic Substances Control
M&M – Monitoring and Mitigation
NoD – Notice of Determination
CDD – Cleanup Decision Documents
PEIR – Program Environmental Impact Report
RP – Responsible Party
SSFL – Santa Susana Field Laboratory
PMP – Program Management Plan
IP – Implementation Plan

SOURCE: ESA

Santa Susana Field Laboratory . 120894

Figure 2-2
SSFL Program Approval Flow Chart

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2.1.3 Contents and Purpose of This PEIR

In accordance with Section 15125(a) of the CEQA Guidelines, an EIR must include a description of the physical environmental conditions in the vicinity of the project as they exist at the time of the Notice of Preparation (NOP) or, if an NOP is not published, at the time the environmental analysis begins. This environmental setting normally constitutes the baseline physical conditions by which a lead agency determines whether an impact is significant.

The environmental analyses of this PEIR uses the NOP dated November 22, 2013, as the baseline for the description of the physical conditions that might be affected by the proposed project. This document has been prepared in sufficient detail to support a decision for approval or rejection of the proposed project, including any subsequently identified activities, under Section 15168(c) of the CEQA Guidelines. DTSC intends that this PEIR be used by other local, regional, and state agencies in the approval process of related permits or approvals associated with cleanup efforts within the project area. These agencies are identified in Section 3.9, *Permits or Approvals Potentially Required*, of this PEIR.

The purpose of an EIR is not to recommend approval or denial of a proposed project; rather, an EIR is required to identify all environmental impacts and specify the significant adverse environmental effects of a proposed project to the physical environment, and to further identify measures that avoid or mitigate those impacts to the extent feasible. In the event that no feasible mitigation measures or alternatives have been identified that would reduce the impact to a less-than-significant level, environmental impacts may be identified as significant and unavoidable. DTSC may still approve the project after adopting all feasible mitigation measures if, through the adoption of CEQA findings and a statement of overriding considerations, it finds that social, economic, legal, technological, or other benefits outweigh these impacts.

2.2 Background

2.2.1 SSFL History

The following is a brief summary of the SSFL site and its historical use. Operational activities at SSFL began in 1948 and primarily included research, development, and testing of liquid-propellant rocket engines, nuclear and non-nuclear energy, lasers, and related technologies. The principal activity was large rocket engine testing by Boeing (and its predecessors including North American Aviation and Rockwell International), the U.S. Air Force (USAF), and NASA. Operations were originally conducted at SSFL on leased property, with the majority of the project site being acquired in 1954 and 1958; development of the western portion of the site began soon after. Liquid-propellant rocket engine testing activities have been conducted at six major rocket engine test areas, beginning in the 1950s: Bowl, Canyon, Bravo, Alfa, Coca, and Delta (ACI and Weitze Research, 2009). The Bowl, Canyon, and Delta test areas were phased out of operation in the late 1960s and 1970s. The Coca test area was shut down in May 1988. The Bravo and Alfa test areas were shut down in 2005 and 2006, respectively.

From 1954 to 2001, DOE and its predecessor agency, the Atomic Energy Commission, sponsored nuclear and non-nuclear energy research and development projects at the site (DOE, 2013). The research center was referred to as the Energy Technology Engineering Center. The research and energy development activities included nuclear energy operations (development, fabrication, disassembly, and examination of 10 nuclear research reactors, reactor fuel, and other radioactive materials) and large-scale liquid sodium metal experiments for testing liquid-metal fast-breeder reactor components (HGL, 2011). The last of the nuclear reactors was shut down by 1974 and the remaining nuclear energy research and handling of nuclear materials ended by 1988 (DOE, 2013).

Undeveloped land parcels to the south of the site were acquired in 1968 and 1976 (MWH, 2004). Parcels to the north of the site were acquired in 1998 (MWH, 2004). As shown in Figure 2-1 and referred to as the Northern and Southern Undeveloped Areas (also referred to as the buffer zones), the undeveloped areas of SSFL were primarily used for historical ranching and grazing and for motion picture film-making. No SSFL-related operations were conducted in these areas.

2.2.2 Past Chemical and Radiological Use

The past operational activities at SSFL resulted in the release of chemicals of concern to both soil and groundwater. Engine testing in the six rocket engine test areas primarily used petroleum-based compounds as fuel and liquid oxygen as the oxidizer. Solvents, primarily trichloroethene (TCE), were used to clean engine components, and for other equipment degreasing operations at SSFL. In 1961, a TCE recycling system was installed in active testing areas to capture and reuse this solvent. After 1977, TCE was used (and reclaimed) only at the Alfa test stand location (MWH, 2004). TCE use at the project site was discontinued in the early 1990s. In addition to the primary facility operation for testing liquid-propelled rocket engines, the site was used for research, development, and testing of water jet pumps and lasers. Additional site history, including specific release sources and mechanisms are included in the various site specific investigation and characterization documents prepared to date.

Laboratories, chemical storage areas, equipment assembly, and maintenance facilities supported operations at SSFL (MWH, 2004). Laboratories were used to supply chemicals for testing operations, or to conduct small-scale testing of materials (e.g., metals). Liquid chemicals were historically stored in various types of containers and vessels, including drums, aboveground storage tanks (ASTs), and underground storage tanks (USTs). Solid or powdered chemicals used at SSFL were stored in drums or small containers and often kept in buildings or above-grade storage pads. Equipment assembly was typically performed inside buildings and involved chemical use in small quantities. A summary of the primary chemicals and radionuclides used for SSFL operations is provided in **Table 2-1**. A complete list of chemicals and radionuclides, as well as the associated sources can be found in investigation and characterization documents.

TABLE 2-1
CHEMICAL AND RADIOLOGICAL USE AND WASTES GENERATED AT SSFL

Chemical or Waste Category	Use/Source	Primary Types of Chemicals and Radionuclides Used/Stored/Produced
Petroleum test fuels	Large engine and component systems testing	RP-1 (kerosene), JP-4 (jet fuel)
Storable test fuels	Small engine and component testing	monomethyl hydrazine (MMH), unsymmetrical dimethyl hydrazine (UDMH), hydrazine derivatives, N-nitrosodimethylamine
Oxidizers	Engine and component systems testing	nitrogen tetraoxide (NTO), inhibited red fuming nitric acid (IRFNA), liquid oxygen, and fluorine compounds
Solvents	Cleaning	TCE, tetrachloroethene (PCE), TCA, 1,1-dichloroethane (DCA), chlorofluorocarbons (Freon compounds), 1,4-dioxane
Caustic and acidic solutions	Laboratory testing	potassium hydroxide, sodium hydroxide, hydrochloric and other acids
Scrap metals	Construction	copper, lead, zinc, cadmium,
Polychlorinated biphenyls	Pre-1980 transformers, waste oils	primarily aroclor 1254/1260 mixtures
Waste burn products	Generated through burning practices	polycyclic aromatic hydrocarbons (PAHs) and dioxins/furans
Solid propellants and energetic compounds	Igniters and energetic testing	perchlorate, beryllium, glycidyl azide polymer (GAP), cyclonite (RDX), octogen (HMX), and composition C (C-4)
Vehicle fuels	Transportation	petroleum hydrocarbons (gasoline-range)
Waste oil	Maintenance operations, lubricating oils	petroleum hydrocarbons (oil-range)
Construction debris	Construction	concrete, asphalt, wood, scrap metal, insulation materials, and asbestos
“Green liquor” wastewater	Coal gasification processes	water containing organic and sulfur compounds, and ash (generated from coal gasification operations)
Incinerator ash	Refuse burning (paper, wood, etc.)	PAHs, dioxins, and metals
Photographic waste	Photo and x-ray development	silver
Nuclear and non-nuclear energy research wastes	Area IV nuclear and non-nuclear energy, research, and testing	sodium potassium (NaK), sodium, mercury, cesium-137, strontium-90, plutonium-239/240, cobalt-60, europium-152, plutonium-238, americium-241, and curium-243/244
Pyrophoric material	Ignition source	triethylaluminum/triethylborane (TEA/TEB)
Water treatment	Control algal growth in ponds and cooling towers	sodium hypochlorite, hydrazine, hexavalent chromium

NOTE: See acronym list within Chapter 10.0 of this PEIR for definition of acronyms.
Some of the chemicals and radionuclides listed are present as a result of naturally occurring conditions or regional atmospheric deposition; details of background versus anthropogenic sources are discussed in investigation and characterization documents prepared to date and will be further refined in cleanup decision documents.

SOURCES: ICF, 1993; SAIC, 1994; Ogden, 1996; MWH, 2004.

Petroleum fuel hydrocarbons and chlorinated solvents were used at SSFL in the largest volumes. Another solvent, used in lesser quantities, 1,1,1-trichloroethane (TCA), contained 1,4-dioxane as a stabilizer to increase the longevity and usefulness of the solvent. However, based on facility records, 1,4-dioxane was not added to TCE as a stabilizer for rocket engine testing operations at SSFL because it also caused an undesirable residue on engine components that did not meet specifications. Solid propellants, including perchlorate compounds, were used at SSFL for research and testing operations. Perchlorate was used in smaller quantities as an oxidizer for the production of turbine spinners and igniters; for research, development, and production of flares; and for small-scale solid-propellant rocket motor research, development, and testing. Polychlorinated biphenyls (PCBs) were present in some waste oils, as well as oils within pre-1980 electrical transformers at various sites within SSFL.

Other chemicals may have entered the environment as by-products of operations at SSFL. The periodic burning of petroleum fuels that accumulated in the ponds may have produced polychlorinated dibenzodioxins and dibenzofurans (dioxins/furans). N-nitrosodimethylamine may have been produced by the environmental breakdown of UDMH. UDMH and MMH were used as a fuel in testing certain rocket engines for research and development at a few limited locations within the project site. Various metals may have been used in machining operations or stored or disposed of as construction debris.

The nuclear research conducted in Area IV (see Figure 2-1) also resulted in the accidental release of radioactive elements to the environment. A series of DOE contractors operated the Energy Technology Engineering Center (ETEC), located exclusively in Area IV, for researching, developing, and constructing nuclear reactors and associated equipment for harnessing nuclear energy. Until its closure in 1996, DOE, through its contractors, was responsible for operating ETEC. ETEC represented the group of facilities owned by DOE that were used for nuclear research and other experimental activities within Area IV. From the mid-1950s until the mid-1990s, DOE and its predecessor agencies were engaged in or sponsored nuclear operations including the development, fabrication, disassembly, and examination of nuclear reactors, reactor fuel, and other radioactive materials. Associated experiments included large-scale sodium metal testing for fast breeder reactor components. Nuclear operations at ETEC included 10 nuclear research reactors, including the Sodium Reactor Experiment (SRE), seven critical facilities, the Hot Laboratory, the Nuclear Materials Development Facility, the Radioactive Materials Handling Facility (RMHF), and various test and radioactive material storage areas. During the operational history, there were accidents, leaks and releases of radionuclides and chemicals. Some of the contamination was cleaned up by DOE, while doing decontamination and decommissioning activities, but there is still significant levels of cleanup required. Additional details for each of these facilities are presented in the Final Historical Site Assessment (HGL, 2012a) and other investigation and characterization documents. All nuclear research in Area IV was terminated in 1988, when DOE shifted its focus from research to decontamination and decommissioning activities.

Chemical and solid wastes created from facility operations have been managed through various methods. Three landfills were used at SSFL primarily for disposal of non-hazardous, inert construction debris (concrete, asphalt, rock, soil, etc.). Liquid wastes from engine testing were managed until the 1980s in a series of both flow-through and retention ponds. Ten of these ponds (impoundments) have undergone closure: one was clean-closed and nine were closed as RCRA-regulated units, managed under the Post-Closure Permit, described later in this chapter. After closure of these impoundments, wastes were managed for offsite recycling, treatment, or disposal. Additional minor waste management methods including small burn off pits, leach fields and ozonators are described in investigation and characterization documents.

Radioactive and mixed wastes were managed for offsite disposal at the RMHF; non-radioactive, alkaline, and liquid-metal wastes were managed and treated at the Hazardous Waste Management Facility (HWMF). The Thermal Treatment Facility (TTF) was used for open burn/open detonation of hypergolic, reactive, and explosive wastes.

2.2.3 Regulatory History

During the operational years of 1948 through 2006, SSFL was regulated under the jurisdiction of a number of regulatory agencies and programs. These programs addressed hazardous materials storage and use, waste management, and site cleanup for active facilities during their operational life, as well as closure, post-closure, and cleanup actions for post-operational facilities and programs. Operational programs are no longer active since all research and development ceased as of 2006. The current regulatory framework for site closure and cleanup activities is summarized in the following pages.

2.2.3.1 Pre-2007 Consent Order Regulatory History

Solid Waste Management Units and Areas of Concern

Before active research programs were stopped at the project site, a number of site closure and cleanup actions were initiated under the RCRA Corrective Action Process (DTSC, 2012). In July 1991, Region IX of USEPA issued an Interim Final RCRA Facility Assessment (RFA) that initially identified 122 locations of the project site for designation as Solid Waste Management Units (SWMUs) and areas of concern (SAIC, 1991).[3] Then, on November 12, 1992, DTSC issued a stipulated enforcement order to Rockwell International as a result of the RFA to initiate investigation and cleanup. Subsequent studies by USEPA and DTSC identified 13 additional locations for a total of 135 SWMUs and areas of concern. For investigation purposes those SWMUs and areas of concern have been grouped by location into the current RCRA Facility Investigation (RFI) Sites.

[3] SWMUs were originally defined as "Any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released." Subsequent clarifications indicate that not all areas (e.g., one-time spills) where releases have occurred are considered SWMUs. To reflect a more holistic approach, permits and orders often use the term "areas of concern" to refer to releases which warrant investigation or remediation, regardless of whether associated with a specific SWMU, as the term is currently used.

Operable Units

As defined by USEPA, an Operable Unit (OU) is a discrete entity that may comprise various attributes, including characteristics of the contaminated media (i.e., weathered rock, unweathered rock, soil, sediment, groundwater, etc.), geographical location, vertical and aerial considerations, specific site problems, and potential exposure pathways. An OU may also consider various phases of an action, any set of actions performed over time, or any actions that are concurrent but located in different parts of a site. The cleanup of a site can be divided into a number of OUs, depending on the complexity of the problems associated with the site. The OUs identified at this project site are consistent with this definition and incorporate different geographical portions of the site, project phases, and exposure pathways.

Since the early 1980s, SSFL site characterization has proceeded along two parallel paths, one for groundwater and the other for soil and related surficial media. In 1999, this approach was formalized by defining the groundwater and surficial media as two separate OUs for investigation purposes, and was carried forward into the 2007 Consent Order and the 2010 AOCs, described in more detail later in this section. The two OUs were defined at the project site based on an understanding of where contaminants are present, where they may migrate in the future, and how either human or ecological receptors[4] may be exposed to those contaminants (DTSC, 1999; MWH, 2014). The OUs at the project site are the Surficial Media OU and the Chatsworth Formation OU (groundwater). The boundary between these two OUs is the boundary between weathered and unweathered bedrock. The surficial media OU was then broken into several RFI sites for investigation purposes as discussed above. A brief description of the OUs is provided below (see also Figure 3.3 in Chapter 3.0, *Project Description,* of this PEIR).

- **Surficial Media OU (Soil):** The Surficial Media OU consists of soil, sediment, and surface water, which are potentially contaminated by spills or waste management practices at the project site. Also included in this OU are near-surface (perched) groundwater, air, biota, and the upper, weathered portion of the bedrock. These additional media have been included in the Surficial Media OU, because contaminants released into soil, sediment, or surface water could directly contact and potentially be transferred to near-surface groundwater, air, biota, and weathered bedrock. Studies indicate that volatile organic compounds (VOCs) including TCE, metals, total petroleum hydrocarbons, radionuclides, perchlorate, PAHs, semi-volatile organics (SVOCs), dioxins, and PCBs, among other less prevalent contaminants, are present in the surficial media.
- **Chatsworth Formation OU (Groundwater):** The Chatsworth Formation OU consists of groundwater and both the saturated and unsaturated unweathered (competent) bedrock of the Chatsworth Formation. The Chatsworth Formation bedrock is composed of thickly bedded sandstone with interbeds of siltstone and shale and is unweathered and competent within the Chatsworth Formation OU. This unit has been contaminated by a downward flow of chlorinated solvents (primarily TCE) from surficial spills and/or by dissolved contaminants transported by Chatsworth Formation groundwater. VOCs, metals, total petroleum

[4] A "human receptor" is a hypothetical individual who may be exposed to compounds in the environment. Receptors are often identified by the behaviors that determine how or with what intensity they may be exposed, such as "workers" or "residential receptors." An "ecological receptor" is an organism that occurs onsite that may be exposed to compounds in the environment.

hydrocarbons, radionuclides, perchlorate, among other less prevalent contaminants are present in groundwater.

2.2.3.2 Standardized Risk Assessment Methodology

A Standardized Risk Assessment Methodology Work Plan (SRAM) was initially prepared in 2000 to establish a consistent technical approach for conducting risk assessments, which will serve as a basis for setting risk based cleanup goals or standards at SSFL. Since that time two significant updates have occurred, one in 2005 (Rev. 2) and then in 2014; these updates were prepared to incorporate the latest USEPA and DTSC risk assessment policies and procedures and to incorporate a more refined understanding of the overall Conceptual Site Model.

The 2007 Consent Order cites the SRAM as the methodology to develop risk assessments which will serve as the basis for setting cleanup goals or standards for the Boeing sites. In 2010, NASA and DOE entered into respective AOCs. The 2010 AOCs require DOE and NASA to clean up impacted soils to natural background levels, or to reporting limits.[5] The 2010 AOCs do not require DOE or NASA to conduct a risk assessment for their respective investigational units.[6]

The SSFL groundwater and surface water cleanup is covered under the 2007 Consent Order. Groundwater and surface water data will be evaluated in accordance with the SRAM (MWH, 2014) and the cleanup requirements for groundwater will be based on regulatory limits or risk-based values where regulatory limits do not exist.

Potential human and ecologic exposures to contaminants can occur either onsite or as a result of contaminant migration to offsite areas. The objective of the SRAM is to provide a consistent approach for risk assessment. Although each investigational unit is unique, many have similar potential contaminants, exposure pathways, and receptors. The first step in the risk assessment process is to use a consistent technical approach for all investigational units. The SRAM applies to each investigational unit that is subject to a risk based cleanup, to determine the potential human and ecological risks due to exposures to contaminants present in various media at SSFL.

The SRAM developed a Conceptual Site Model identifying the potential human and ecological receptors and the methodology for conducting the human health and ecological risk assessments, and serves as the basis for developing the numerical cleanup requirements. The Conceptual Site Model is applied and updated based on field observations, current and future site use scenarios and data collected during the investigations at the site. As discussed in the SRAM, cleanup for radionuclides (as opposed to chemicals) is addressed outside of RCRA, as summarized below.

2.2.3.3 2007 Consent Order

In August 2007, Boeing, DOE, NASA, and DTSC entered into a Consent Order for Corrective Action (State of California DTSC Docket No. P3-07/08-003, 2007), herein referred to as the 2007

5 Method reporting limits for chemicals, minimum detectable concentration for radionuclides.

6 Investigational unit is an encompassing term that includes SWMUs, areas of concern and chemical use areas that have been previously agreed upon at the site to define the aerial footprints of various investigations. The term is included in this section primarily for consistency with the 2014 SRAM (MWH, 2014).

Consent Order, which uses authority under the federal RCRA and the California Hazardous Waste Control Law (California Health and Safety Code Section 25100, et seq.) to regulate cleanup of contaminated environmental media at the project site. The 2007 Consent Order summarized the permitting status, listed the investigation and remedial actions conducted as of that date, and identified activities for further investigation and the future cleanup of soil, groundwater, and surface water. The required actions included the following:

- Perform all work consistent with the RFI Work Plans, Corrective Measures Study Work Plans, Corrective Measures Implementation Work Plans, and any other DTSC-approved work plans, required to be prepared in compliance with the Order, consistent with relevant State and federal law, implementing regulations, and applicable guidance.
- Submit RFI Reports for each of the 10 RFI Group reporting areas for the Surficial Media OU.
- Prepare and submit work plans to complete the ongoing Chatsworth Formation OU groundwater investigation.
- Prepare and submit Corrective Measures Study Work Plans and Reports for the Surficial Media OU[7] and the Chatsworth Formation OU.
- Prepare and submit Corrective Measures Implementation Work Plans, upon DTSC's selection of the corrective measures for the Surficial Media and the Chatsworth Formation OUs.
- Assess the need for interim measures, on an ongoing basis, to control or abate immediate threats to human health or the environment, and prevent and/or minimize the spread of contaminants while long-term corrective action alternatives are being evaluated.

The 2007 Consent Order required the RPs submit a schedule (with tasks, milestones and timeline) for the following:

- Remediation of chemically contaminated soils by June 30, 2017, utilizing SRAM (Rev. 2).
- Complete construction of DTSC-approved groundwater and unsaturated zone cleanup remedies in the Chatsworth Formation OU by June 30, 2017.
- Complete construction of DTSC-approved long-term soil cleanup remedy in the Surficial Media OU by June 30, 2017.

Extensive sampling was needed to fully characterize soil contamination. Schedules to complete cleanup will be incorporated into cleanup decision documents.

For the purposes of this PEIR, it is estimated that soil remediation activities would be completed in approximately 15 years, and Chatsworth Formation groundwater unsaturated zone cleanup remedies would be in place during that time (although natural attenuation monitoring activities may occur over a longer period of time based on confirmation sampling).

The SSFL groundwater and surface water cleanup is covered under the 2007 Consent Order. Groundwater and surface water data will be evaluated in accordance with the SRAM (MWH,

[7] Corrective Measures Study Work Plans only refer to Boeing areas of responsibility. Surficial media in NASA and DOE areas of responsibility would be dictated by the 2010 AOCs.

2014) and the cleanup requirements for groundwater will be based on regulatory limits or risk-based values where regulatory limits do not exist.

2.2.3.4 2010 Administrative Orders on Consent

In December 2010, DOE and NASA entered into separate AOCs for Remedial Action with DTSC to address soil cleanup within Area IV (DOE), Area II, and a 41.7-acre portion of Area I (NASA). The 2010 AOCs stipulate specific remedial requirements, including the characterization and cleanup of soil contamination on the NASA- and DOE-administered areas of the project site to Look-Up Table (LUT) values. The 2010 AOCs Remediation Standard requires that "no contaminants shall remain in the soil above local background levels," unless the minimum detection limit for a contaminant is above background levels (or other exceptions apply). In this case, DTSC must use the minimum detection limit for the contaminant. DTSC compiled contaminants' provisional background levels and detection limits in a LUT (see Appendix B of this PEIR). This PEIR refers to the AOC Remediation Standard as "AOC background."

As required by the 2010 AOCs, DTSC developed draft Provisional Radiological LUT values in conjunction with USEPA, and draft chemical LUT values. [8] The 2010 AOCs also include some potential exceptions to cleanup requirements for areas with biological and/or cultural resources or for "unforeseen circumstances" to the extent cleanup cannot be achieved through technologically feasible measures. [9]

In addition, the 2010 AOCs specifically prohibit "leave in place," onsite burial, and landfilling of contaminated soil/sediments remedial approaches.

2.2.3.5 Soil Cleanup Requirements

The 2007 Consent Order and the 2010 AOCs establish the requirements for the cleanup of contaminated media. The following sections discuss the cleanup requirements designed to achieve the remedial objectives. As a result of the Orders, the soil cleanup requirements for Boeing areas are different from the soil cleanup requirements for DOE and NASA areas, as discussed in this section for each RP.

Boeing Areas of Responsibility

The removal of hazardous waste and materials contaminated with hazardous waste or hazardous constituents is necessary to protect human health and the environment (52 FR 8704, March 19, 1987). Since 1987, USEPA and the state have developed considerable experience in making protective, risk-based cleanup decisions under the RCRA corrective action and CERCLA

[8] Draft Provisional Radiological LUT values and draft chemical LUT values will be finalized ahead of or in conjunction with the respective final cleanup decision documents.

[9] On September 3, 2010, DOE and NASA agreed to a Joint Settlement Framework in the Agreement in Principal (AIP), which is incorporated into the AOCs as Attachment B. DOE and NASA agreed that their cleanup obligations with respect to soil contamination at the site shall be conducted in accordance with and be governed by the AIP. While the AOCs generally provide for "exemptions", these measures are defined in the AIP in detail and are referred to as "exceptions." As such, in this PEIR, DTSC refers to these provisions as "AOC exceptions" or "exceptions."

programs. Site-specific considerations are used to develop, risk-based media cleanup levels under the RCRA corrective action and CERCLA cleanup programs. Those site-specific risk-based levels define clean closure, or indicate that a site cleanup is protective of human health and the environment. An important site-specific consideration when developing risk-based cleanup levels is the reasonably anticipated land-use scenario.

For the SSFL cleanup, DTSC solicited input from the County of Ventura regarding zoning and anticipated land-use scenarios. The County provided a detailed summary of allowed uses, including recreation, residential, and agricultural uses. (Ventura County, 2015)

For risk assessment, a Conceptual Site Model is developed to identify who or what (receptors) could be potentially exposed to contaminants and how (routes or exposure pathways) that exposure could occur. Consistent with direction from the County of Ventura regarding allowable future uses, the potential human receptors identified in the Conceptual Site Model include potential residents, workers, recreational users, and trespassers, as well as consumption of food grown or raised on the site. Because the intensity and duration of exposure for residents would be greater than for other potential uses of the property (e.g., future onsite employees, open space users), the residential risk scenario predicts the highest potential risks. As evaluated for the project, the residential risk scenario includes consumption of foods through a "garden pathway".

The 2007 Consent Order establishes the decision-making process for the cleanup of contaminated soils at Boeing's property. The 2007 Consent Order identifies the types of chemicals to be cleaned up and requires the actual cleanup of soil contaminated by those chemicals be decided "utilizing the Standardized Risk Assessment Methodology (SRAM)" for SSFL (Section 2.5). Section 3.5.2 in the 2007 Consent Order also specifically states: Cleanups plans "shall detail the methodology for developing and evaluating potential corrective measures [cleanup actions] to remedy chemical contamination at the Facility utilizing the Standardized Risk Assessment Methodology (SRAM) Workplan (Rev.2)."

The DTSC approved Final Standardized Risk Assessment Methodology Revision 2 Addendum (MWH, 2014) presents the Conceptual Site Model, which identifies the potential human and ecological receptors and the methodology for conducting the human health and ecological risk assessments.

The SRAM is a "living document" and new contaminants can be added to the list, as needed. In addition, since the Corrective Measures Studies have not been completed or approved, the risk-based screening levels used for characterization purposes should be considered preliminary screening levels and are surrogates for risk-based cleanup requirements.

The potential ecological receptors include various mammals known to frequent the project site and aquatic species. The SRAM also provided the methodology to develop ecological risk-based screening levels, which are included in **Appendix B**.

As part of the project development and following the SRAM, Boeing developed proposed risk-based screening levels (see Appendix B). All the Suburban Residential Scenarios assume that the

resident is exposed for 350-days/year, for 24 years as an adult, and 6 years as a child. For various reasons, USEPA standard chemical risk assessments do not include a garden pathway. However, for the SSFL project, the SRAM specifies that a garden pathway will be evaluated. Human health risk-based screening levels were developed for different Suburban Residential Scenarios including:

- USEPA default-based (with garden) scenario.
- SSFL SRAM-based (with garden) scenario.
- SSFL SRAM-based (no garden) scenario.

The USEPA default-based (with garden) scenario assumes that 25 percent of all produce consumed by the resident over a time frame of 30 years is contaminated. The SSFL SRAM-based (with garden) scenario assumes that 100 percent of all the produce consumed is contaminated being grown in garden. The SSFL SRAM-based (no garden) scenario assumes no exposure to home grown produce.

The estimated maximum soil cleanup volumes presented in this PEIR for the Boeing portion of SSFL were based on the Suburban Residential risk scenario with 25 percent garden consumption.[10] This scenario protects all reasonably foreseeable future land uses. The associated volume estimates support the programmatic impact analysis in this PEIR. The final cleanup decision documents will specify the final cleanup levels that will be applied for the Boeing cleanup. Page 5.6 of the DTSC-approved SRAM contains information to assess risks for a number of different land use scenarios, but states: "As a most conservative measure, residential land use, as described in the conceptual site model (Section 4) will be evaluated as the future land use scenario." In other words, the SRAM must assess a wide variety of risks at the property including residential uses as authorized by county zoning rules. Consistent with applicable law, the SRAM also goes on to state: "Final decisions regarding remediation will be based on weight-of-evidence evaluations performed using criteria such as the nine National Contingency Plan (NCP) balancing criteria found in Title 40 of the Code of Federal Regulations (40 CFR) Part 300.430 (e)(9)(iii)." (SRAM, Methodology for the Calculation of Human Health Risk-Based Screening Levels for Chemicals in Soil at the SSFL, Attachment 1: Risk-Based Screening Levels Calculation Approach and Equations, page 2)

On April 24, 2017, Boeing filed a conservation easement for its portion of SSFL. The easement's purpose is to have the North American Land Trust manage and maintain the property consistent with preserving, protecting, and maintaining in perpetuity the property's Conservation Values. The easement's Conservation Values include the area's habitat, open space, cultural resources, and scenic, educational, scientific, and recreational values. The easement further refines its purpose to include the primary purposes (habitat, open space, and cultural resources) and, to the extent consistent with primary purposes, other conservation values (e.g., scenic, historic, educational, scientific, and recreational).

[10] 25 percent represents the fraction of contaminated produce that is consumed and is the input parameter from the SRAM. It is based on current USEPA default parameters.

Notwithstanding the recording of the conservation easement, the PEIR analyzes the environmental impacts of the most extensive set of cleanup activities evaluated and proposed for the Boeing project, Suburban Residential use with garden consumption of 25 percent of total diet. The PEIR's analysis captures the environmental impacts of the cleanup for less intensive future land use scenarios that could result in removal of less soil and sediment from the project site, a smaller project footprint, and a shorter project duration.

DOE and NASA Areas of Responsibility

The DOE and NASA soil cleanup requirements are to meet the AOC background" levels. The 2010 AOCs include exceptions for locations with significant biological (habitat or species protected under the Endangered Species Act) or cultural resources (e.g., Native American artifacts). DTSC will continue to develop the LUT values for chemicals and, pursuant to the AOCs, develop LUT values for radionuclides. The provisional chemical and radionuclide LUT values are also included in Appendix B.

2.2.3.6 Groundwater Cleanup Requirements

The groundwater cleanup requirements for chemicals and radionuclides derive from the 2007 Consent Order. As with the cleanup requirements for soils in Boeing areas of responsibility, the groundwater will be evaluated, recognizing that aquifer restoration is the primary remedial action objective. The proposed groundwater chemical and radionuclide cleanup requirements are based on regulatory limits or risk-based values where limits do not exist. The cleanup requirements will be based on a compendium of site-specific levels, regulatory requirements, and applicable water quality goals: (1) site-specific metals concentrations; (2) isotope-specific activity limits; (3) primary and secondary maximum concentration limits (MCL) (both federal and state); (4) California Department of Public Health (CDPH) Notification/Advisory Levels; (5) taste and odor thresholds; and (6) site-specific risk-based values assuming direct ingestion. SSFL groundwater cleanup requirements, also referred to as "Groundwater Screening Reference Values" in other documents, are the same for all three RPs and are included in Appendix B. The groundwater cleanup requirements will be finalized in the groundwater cleanup decision document.

2.2.3.7 Regional Water Quality Control Board

Stormwater treatment at the project site is governed by the Waste Discharge Requirements (WDRs) and National Pollutants Discharge Elimination System (NPDES) permit issued to Boeing (Order No. R-4-2015-033, NPDES No. CA0001309) by the Los Angeles Regional Water Quality Control Board (LARWQCB).[11]

Although the current NPDES permit is issued to Boeing, it governs the entire SSFL site, and DOE and NASA support compliance with its provisions because discharges from their activities are also covered by the permit. The NPDES permit addresses discharges at 14 outfalls. Two of

[11] The WDR Order and NPDES Permit was issued on February 23, 2015, and may be found at: http://www.waterboards.ca.gov/losangeles/board_decisions/adopted_orders/year.shtml

the outfalls may be used by Boeing and NASA to discharge Groundwater Extraction and Treatment System (GETS) effluent. The RPs, under the direction of DTSC, will evaluate the feasibility of reinjecting treated groundwater.

Each of the RPs, under the direction of DTSC, will implement separate surface water control and monitoring measures established by the NPDES or other regulatory program in the watersheds where they are performing the activities addressed by this PEIR.

2.2.3.8 RCRA Facilities and Post-Closure Permits

The following RCRA Facilities are evaluated in this PEIR:

- Areas I and III Post-Closure Permit CAD 093365435 issued in 1995 to Boeing for five surface impoundments and operation of groundwater treatment systems. The groundwater treatment systems listed under this permit have been removed and were certified clean closed in 2011.
- Area II Post-Closure Permit CA 1800090010 issued in 1995 to NASA (owner) and Boeing ([former] operator) for four surface impoundments and three groundwater treatment systems. The three groundwater treatment systems listed under this permit have been removed and were certified clean closed in 2011. DTSC has subsequently approved NASA modification request to make NASA both owner and operator of the four surface impoundments, and Boeing is no longer named on the permit.
- Area IV HWMF Operating Permit USEPA ID Number CAD 000629972 issued in 1993 to DOE (owner) and Boeing ([former] operator and current land owner). The HWMF has been inactive since 1997. Completion of closure activities is pending. DTSC has subsequently approved a DOE modification request to make DOE both owner and operator of the HWMF, and Boeing is named on the permit as the property owner but no longer as the facility operator.
- Area IV RMHF is an interim status authorized facility, USEPA ID Number CA 3890090001 issued in 1997 to DOE (owner) and Boeing ([former] operator and current land owner). The RMHF has been essentially inactive since 2006, though a small amount of radioactive material still resides at the facility, pending determination of final disposition. Completion of closure activities is pending.
- Area III Thermal Treatment Facility is an interim status facility, USEPA ID Number CAD093365435 issued in 1990 to Boeing. Boeing began the closure activities in 1993. Completion of closure activities is pending.

2.2.3.9 California Department of Fish and Wildlife

The California Department of Fish and Wildlife (CDFW) is a state trustee agency responsible for streambed alteration agreements, implementing the California Endangered Species Act, identification and protection of sensitive or protected species and related habitat conservation. Changes to surface water discharges from the GETS, have required DTSC and RP coordination with CDFW for streambed alteration agreements. See Section 4.3.2.2 of this PEIR for more information about CDFW's regulatory responsibilities.

2.3 Agency Roles and Responsibilities

The CEQA Guidelines identify the lead agency as the public agency with the principal responsibility for carrying out or approving a project (CEQA Guidelines Section 15367). DTSC is the CEQA lead agency for the proposed project because DTSC has the primary and ultimate approval authority for the SSFL cleanup project. DTSC may also approve other cleanup related activities (see Section 3.8, *Permits or Approvals Potentially Required*, of this PEIR).

2.3.1 State and Local Agencies

A number of other agencies serve as responsible and trustee agencies, pursuant to CEQA Guidelines Section 15381 and Section 15386, respectively. This PEIR provides environmental information to these and other public agencies that may be required to grant approvals or otherwise coordinate with DTSC, the federal government, or other agencies as part of project implementation. For the purposes of CEQA, the term "responsible agency" includes all state and local public agencies, other than the lead agency, that have discretionary approval over the project (CEQA Guidelines Section 15381). Trustee agencies are state agencies that have jurisdiction by law over natural resources affected by the project and held in trust for the people of the state of California. Trustee agencies for this project include CDFW (CEQA Guidelines Section 15386). Future discretionary approvals may include issuance of a permit, or other required action (see Section 3.8, *Permits or Approvals Potentially Required*, of this PEIR) by a trustee agency.

This PEIR is intended to be used as the primary CEQA document for any permits or approvals from DTSC or other state or local public agencies that may be required for implementation of the proposed project as described in this PEIR.

2.3.2 Federal Agencies

Federal agencies may review the PEIR and submit comments and/or use the information as part of their own approval processes. In addition, DOE and NASA are federal agencies and are required to comply with the National Environmental Policy Act (NEPA) for the cleanup of their respective areas of responsibility within the project site. However, as mentioned above, DTSC is the CEQA lead agency for the proposed project and has the primary and ultimate approval authority for the SSFL cleanup project, regardless of the information in the NEPA documents.

NEPA requires federal agencies to evaluate the environmental effects of a federal undertaking and its alternatives. If the environmental consequences of a proposed federal undertaking are anticipated to be significant or environmentally controversial, an Environmental Impact Statement (EIS) must then be prepared. An EIS is a disclosure document that details the process through which the proposed action was developed, includes consideration of a range of reasonable alternatives, analyzes the potential impacts resulting from the alternatives, and demonstrates compliance with other applicable environmental laws and executive orders. The status of the NEPA review process for NASA and DOE is discussed below:

- **NASA:** NASA completed a Final EIS for cleanup and demolition activities within their respective areas of responsibility. On July 6, 2011, NASA published a Notice of Intent (NOI)

in the Federal Register to prepare an EIS and conduct scoping for the proposed demolition and cleanup activities at the NASA portion of the project site. Public scoping meetings were held in Chatsworth, Simi Valley, and West Hills on August 16, 17, and 18, 2011.

NASA published a Notice of Availability (NOA) of the Draft EIS in the Federal Register on August 2, 2013, with a 45-day public comment period. At the request of the public, NASA extended the comment period an additional 15 days, providing a 60-day comment period through October 1, 2013. NASA held two public meetings on August 27, and August 28, 2013, in West Hills, California. Because of the government shutdown that occurred on October 1, 2013, NASA accepted comments through October 17, 2013.

NASA published an NOA of the Final EIS in the Federal Register on March 14, 2014. USEPA published an NOA for NASA's Final EIS on March 14, 2014, and issued a finding of no objection to the Proposed Action on April 10, 2014. The NASA Record of Decision (ROD) to proceed with the demolition activities described in the Final EIS was issued in April 2014.

Analysis in this PEIR is in part based on information provided by NASA in its EIS. Copies of NASA's Draft and Final EIS and technical documents are available at http://ssfl.msfc.nasa.gov. NASA will prepare a second NEPA ROD on the specific techniques to accomplish the environmental (soil and groundwater) cleanup required to meet the 2010 AOC (for soils), and 2007 Consent Order (for groundwater). Preparation of the ROD was deferred in 2014 to allow NASA to complete soil and groundwater fieldwork, conduct additional archaeological surveys and perform cleanup technology feasibility studies. These studies are required to accurately identify the details and potential impacts of the proposed cleanup actions.

- **DOE:** On February 7, 2014, as part of the NEPA process, DOE issued an Amended NOI in the Federal Register for the remediation of Area IV and the Northern Buffer Zone of the project site. DOE held two scoping meetings (February 27, and March 1, 2014) to receive comments to be addressed in the Draft EIS. DOE published an NOA of the Draft EIS in the Federal Register on January 6, 2017 with a 60-day public comment period. Thereafter, DOE will prepare a Final EIS, and then issue a ROD, describing the evaluation process and the basis for selection of the chosen alternative.

  Analysis in this PEIR is in part based on information provided by DOE in their EIS. Copies of DOE's Draft EIS and technical documents are available at http://etec.energy.gov

2.4 Environmental Review Process

This PEIR has been prepared to meet all of the substantive and procedural requirements of CEQA (PRC, Sections 21000 et seq.), as amended, the CEQA Guidelines (CCR Title 14, Sections 15000 et seq.), and the rules, regulations, and procedures for the implementation of CEQA as executed by DTSC. DTSC is the lead agency for this project, taking primary responsibility for conducting the environmental review process and ultimately approving or denying the SSFL cleanup project and imposing mitigation measures.

In compliance with the CEQA Guidelines, DTSC has provided opportunities for the public to participate in the environmental review process. Notice, outreach, and consultation were conducted with trustee and responsible agencies, federal agencies, tribal representatives, and members of the public and relevant communities during the CEQA scoping process. This

includes, as further described in this section, the distribution of an NOP and Draft PEIR as well as public scoping and informational meetings.

2.4.1 Notice of Preparation

Pursuant to the provision of Section 15082 of the CEQA Guidelines, DTSC published the NOP on November 22, 2013 (see **Appendix C** of this PEIR). As required by CEQA Guidelines Section 15375, an NOP is a brief document sent by the lead agency to notify the responsible agencies, trustee agencies, the Governor's Office of Planning and Research (OPR), and involved federal agencies that the lead agency plans to prepare an EIR for a project. The purpose of the notice is to solicit guidance from those agencies as to the scope and content of the environmental information to be included in the PEIR and to solicit recommendations and develop information regarding the scope, focus, and content of the PEIR.

The NOP was circulated to responsible and trustee agencies, federal agencies, Native American Tribes, and interested members of the public. The NOP public comment period concluded on February 10, 2014. DTSC broadly announced the availability of the NOP, public scoping meetings, and extended comment period (75 days) to allow interested agencies and the public to participate. This was accomplished through the following:

- Mailings and email announcements, including copies of a public scoping meeting flier providing scoping period and meeting information.
- Public notices in three local papers of general circulation within the project vicinity (*LA Daily News*, *Ventura County Star*, and *Simi Valley Acorn*).
- The following information repositories that included the NOP as well as public notice and multiple copies of the scoping meeting flier:
  - California State University, Northridge – Oviatt Library (1811 Nordoff Street, 2nd Floor, Room 265, Northridge, CA 91330)
  - DTSC Chatsworth office (9211 Oakdale Avenue, Chatsworth, CA 91330)
  - Platt Library (23600 Victory Boulevard, Woodland Hills, CA 91367)
  - Simi Valley Library (2969 Tapo Canyon Road, Simi Valley, CA 93063)
- Project website postings: http:www.dtsc.ca.gov/SiteClean/Santa_Susana_Field_Lab/

DTSC also mailed a "Community Notice" to public agencies, special districts, tribal representatives, organizations, homeowners, and local residents indicating the availability of the NOP and date/time of the scoping meetings. The Community Notice was distributed by email (approximately 900 addresses) and traditional mail (approximately 4,600 hard copy notices).

In addition, two public meetings were held during the 75-day public comment period, in accordance with PRC Section 21083.9. Depending on the nature of an EIR, a public scoping meeting can be either an optional or required activity under CEQA. For projects of statewide, regional, or area-wide significance, CEQA specifies that the lead agency "shall conduct at least one scoping meeting" during which participants can assist the lead agency in determining the

scope and content of the environmental information required (CEQA Guidelines Section 15082(c)). Public scoping meetings also help accomplish early public consultation with persons or organizations potentially concerned with the environmental effects of the project, prior to Draft EIR completion (CEQA Guidelines Section 15083).

Given the regional interests in the project, as well as DTSC's goals for public involvement, two public scoping meetings were conducted, at the following locations:

- December 10, 2013, Chatsworth: Chatsworth High School (6:00 p.m. to 9:00 p.m.)
- December 14, 2013, Simi Valley: Simi Valley Senior Center (9:00 a.m. to 12:00 p.m.)

The meetings were facilitated by DTSC and generally consisted of a presentation describing the meeting format, SSFL description and history, environmental analysis conducted to date, the PEIR and CEQA process, and opportunities for public involvement. In an effort to ensure that comments were accurately recorded, a court reporter transcribed the proceedings at the scoping meeting. Written comments could be provided on available comment forms, or on an electronic comment form accessible at two laptop stations. Comments on the scope and content of the PEIR were received from various public agencies and individuals from the public. The NOP comments, along with a summary matrix included in the Scoping Report are located in Appendix C of this PEIR. Consultation and coordination with federal, state, and local agencies that would issue permits, approvals, or access to the project site are ongoing.

2.4.2 Draft PEIR

As part of the PEIR process and because of the large volume of soil to be removed from the project site, DTSC solicited comments from the public regarding potential transportation options (routes and methods) and evaluation criteria for the proposed project. Two public meetings were held to solicit public comment on transportation options:

- August 7, 2014, Simi Valley: Simi Valley Senior Center (6:00 p.m. to 9:00 p.m.)
- August 9, 2014, Woodland Hills: El Camino Real High School (10:00 a.m. to 1:00 p.m.)

A Transportation Feasibility Analysis was prepared based on this input and was used to develop alternatives addressed in the PEIR (see Appendix J of this PEIR).

Public and agency review of the project will be further encouraged by DTSC through distribution of the Draft PEIR for at least the required 45-day public review period. The provisions of Sections 15085(a) and 15087(a)(1) of the CEQA Guidelines require that as soon as the Draft PEIR is completed, the lead agency must file a Notice of Completion (NOC) with OPR and that a public NOA be provided to all organizations and individuals who have previously requested notification. DTSC, serving as the lead agency, provided the NOC to OPR and circulated an NOA of the Draft PEIR to residents in the vicinity of the site, in addition to public agencies, special districts, tribal representatives, organizations, and individuals that commented on the NOP and/or requested to be kept informed of the SSFL project. In addition, DTSC placed public notices in three local papers of general circulation within the project vicinity.

This PEIR, as well as appendices and all supporting materials and references, can be found at the project website (http://www.dtsc.ca.gov/SiteCleanup/Santa_Susana_Field_Lab/) and the following locations:

- California State University, Northridge – Oviatt Library (1811 Nordoff Street, 2nd Floor, Room 265, Northridge, CA 91330)
- DTSC Chatsworth office (9211 Oakdale Avenue, Chatsworth, CA 91330)
- Platt Library (23600 Victory Boulevard, Woodland Hills, CA 91367)
- Simi Valley Library (2969 Tapo Canyon Road, Simi Valley, CA 93063)

Public meetings will be held to present the contents of this PEIR and to receive written and oral comments. Public meetings include a forum for the public to review technical information that is presented in the PEIR followed by a public hearing during which the members of the public have an opportunity to provide oral comments or submit written comment cards to the lead agency. All verbal input will be recorded by a court reporter.

Please submit your written comments on the PEIR online or by mail to:

Mail or Fax Letters and Postcards

SSFL CEQA Comments
California Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, CA 95826
Fax: (916) 255-3734

Submit Comments Online

http://SSFL.DTSC.commentinput.com

Any agency, organization, or members of the public desiring to comment on the PEIR must submit their comments prior to the end of the public comment period.

2.4.3 Final PEIR

The Final PEIR consists of the Draft PEIR; revisions to the Draft PEIR; responses to comments addressing concerns raised by individuals, organizations, and public agencies or other reviewing parties; and a Mitigation Monitoring and Reporting Program (MMRP). According to PRC Section 21081.6, for projects in which significant impacts would be minimized by mitigation measures, the lead agency must include an MMRP. The purpose of an MMRP is to ensure compliance with required mitigation measures during implementation of the project. After the Final PEIR is completed, and at least 10 days prior to its certification, a copy of the response to comments on the Draft PEIR will be provided or made available to all commenting parties.

According to PRC Section 21081, when an EIR identifies significant environmental impacts that may result from a project, the lead agency must make specific Findings of Fact (Findings) before certifying the EIR. The purpose of the Findings is to establish the link between the contents of an EIR and the action of the lead agency with regard to approval or denial of the proposed project. Prior to approval of a project, one of three findings must be made, as follows:

- Changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the significant environmental effect as identified in an EIR.
- Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.
- Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in an EIR.

Environmental impacts may not always be mitigated to a less than significant level. When this occurs, impacts are considered significant and unavoidable. To comply with PRC Section 21081, if DTSC concludes that the project would result in significant and unavoidable impacts, which are identified in the Final PEIR, DTSC must adopt a "statement of overriding considerations" prior to approving the project. Under CEQA, statements of overriding considerations are intended to provide a written means by which DTSC balances the benefits of the project and the significant and unavoidable environmental impacts. Where DTSC concludes that the economic, legal, social, technological, or other benefits outweigh the unavoidable environmental impacts, DTSC may find such impacts "acceptable" and approve the project.

2.4.4 Approval Process for Future Documents

As discussed above (page 2-1 of this PEIR), DTSC prepared a PMP to identify and explain the proposed framework and process that will be used for the SSFL cleanup decisions (see Appendix A of this PEIR). The PMP describes how the cleanup would be undertaken in accordance with Chapters 6.5 and 6.8 of the California Health and Safety Code and further describes the proposed implementation of the 2007 Consent Order, 2010 AOCs, and RCRA Hazardous Waste Facility Permitting Program regulations. DTSC will finalize the PMP after reviewing and considering all public comments submitted during the public comment period.

The PMP also serves as a roadmap to aid DTSC in directing the investigation and cleanup at the project site. The PMP will assist in managing the complex nature of the SSFL program, including different soils cleanup requirements of the 2007 Consent Order and 2010 AOCs, RP schedules, and involvement of multiple regulatory agencies. As such, the PMP will be a living document that will be updated to allow incorporation of the best information available, especially as it relates to schedule and the roles of supporting agencies. The current PMP version will be posted on the DTSC SSFL website and revisions will be announced through the document upload notification process. The project-specific cleanup decision documents will refine the plans laid out in the PMP and evaluated in the Final PEIR. Consistent with the framework described in the 2007 Consent Order and 2010 AOC's, and PMP, draft cleanup decision documents with project-specific cleanup requirements will be prepared at a future date for each discreet cleanup project at the proposed project, and made available for public comment.

The 2007 Consent Order and the 2010 AOCs require different, but similar, cleanup decision documents that are described below for reader reference. The Final PEIR and the PMP simply use cleanup decision documents as an encompassing term.

Per the 2007 Consent Order, Boeing will prepare one or more Corrective Measures Studies (CMS) to describe the remediation method(s) recommended for soil in Boeing areas of responsibility. The RPs will also prepare one or more CMS to analyze and make a recommendation for final remediation of groundwater for the entire SSFL site. Draft cleanup decision documents will be prepared and made available for public review and comment. DTSC will approve each cleanup decision document after all relevant information and public comment are evaluated. The 2010 AOC Soils Remedial Action Implementation Plan(s) are the soil cleanup decision documents for DOE and NASA.

Per RCRA Hazardous Waste Facility Permitting Program regulations, Boeing and DOE will prepare closure plans to describe closure of former hazardous waste handling facilities and Boeing and NASA will prepare post-closure permit renewal applications to describe continuing their post-closure monitoring and care of the former surface impoundments.

Approval of the PMP will be the discretionary SSFL program decision made by DTSC that this PEIR evaluates. The initial projects described in this PEIR (cleanup actions at the NASA Area I Liquid Oxygen Plant area, and DOE's radionuclide and co-located chemical areas) will have separate draft cleanup decision documents, that will be available for public comment and review, after this PEIR is finalized. Supporting permits and supporting plans as well as the cleanup decision documents and the subsequent project design documents will also rely on the evaluation provided in this PEIR.

2.5 Scope of This PEIR

The scope of the analysis contained within this PEIR is focused on the environmental resource areas that could be affected by construction, operation, or decommissioning of the proposed project. The PEIR therefore addresses the following environmental issues:

- Aesthetics
- Air quality
- Biological resources
- Cultural resources
- Geology, soils, and seismicity
- Greenhouse gas
- Hazards and hazardous materials
- Hydrology and water quality
- Land use and planning
- Noise
- Transportation and traffic
- Utilities and service systems
- Energy consumption

It was determined that several issue areas would not be affected by implementation of the proposed project based on public comments received on the NOP, comments from the public scoping meetings, and review of existing information. These issue areas include Agricultural and Forestry Resources, Mineral Resources, Population and Housing, Public Services, and Recreation. Chapter 7.0, *Impacts Found Not to be Significant*, of this PEIR provides a summary of those issue areas for which a detailed analysis is not included and the basis for those determinations.

2.6 PEIR Organization

This PEIR is organized into chapters, as identified and briefly described below. Chapters are further divided into sections (e.g., Section 4.2, *Air Quality*).

Chapter 1.0, Executive Summary: Presents a summary of the proposed project activities and the potential environmental impacts. It describes mitigation measures that would be implemented and level of significance after mitigation (as fully described in Chapters 4.0 and 5.0). It also provides a summary of alternatives to the project (as fully described in Chapter 6.0), a summary of known controversial issues, and issues to be resolved.

Chapter 2.0, Introduction: Presents a discussion of the purpose and use of this PEIR, agency roles and responsibilities, the environmental review and CEQA process, and the scope and organization of this PEIR.

Chapter 3.0, Project Description: Provides a detailed description of the proposed project, including the construction, operation, and decommissioning phases. It describes all the features of the proposed project, provides a summary of the remediation technologies that could be implemented, and describes the initial activities proposed for approval. In addition, this chapter describes post-closure permitting, hazardous waste facility closures, and demolition of structures.

Chapter 4.0, Environmental Setting, Impacts and Mitigation: For each environmental issue listed above this chapter describes the existing environmental and regulatory setting, evaluates the potential environmental impacts associated with the proposed project, identifies mitigation for significant impacts, and discusses the level of significance after implementation of those mitigation measures.

Chapter 5.0, Cumulative Impacts: Identifies other past, present, and reasonable foreseeable actions at and in the vicinity of the project site. It evaluates the cumulative impacts associated with implementation of the proposed project in combination with the other identified projects. Where necessary, it identifies mitigation measures to reduce or avoid significant cumulative impacts.

Chapter 6.0, Alternatives: Provides additional information regarding project alternatives to be considered by decision makers in compliance with Section 15126.6 of the CEQA Guidelines. This alternatives analysis evaluates a range of potential alternatives that may reduce significant environmental impacts associated with implementation of the proposed project. In addition, this

chapter summarizes the alternatives that were rejected from further consideration because they did not meet project objectives, or were determined to be impractical or infeasible.

Chapter 7.0, Impacts Found Not to Be Significant: Identifies and summarizes those areas where no environmental effects are anticipated and no further analysis is necessary.

Chapter 8.0, Other CEQA Considerations: Includes a discussion of issues required by CEQA that are not covered in other sections. This includes a discussion of unavoidable adverse impacts, irreversible environmental changes, potential secondary effects caused by implementation of mitigation measures for the project and growth-inducing impacts.

Chapter 9.0, References and List of Preparers: Sets forth a comprehensive listing of all sources of information used in the preparation of PEIR. This includes organizations and persons that were consulted with during the preparation of this PEIR, along with the lead agency personnel and consultants involved with preparation of this PEIR. This chapter also provides a glossary of key terms and definitions that are used throughout the PEIR.

Chapter 10.0, Acronyms: Includes a list of acronyms used throughout this PEIR.

Chapter 11.0, Glossary: Includes a discussion of terms used throughout this PEIR.

Chapter 12.0, Preparers: This chapter lists the persons and organizations that contributed to the preparation of this PEIR.

Appendices: This PEIR includes the following appendices that provide either background information or additional technical support for the analysis

- Appendix A: Program Management Plan
- Appendix B: Preliminary Screening Levels
- Appendix C: Notice of Preparation/Scoping Report
- Appendix D: Air Quality Worksheets
- Appendix E: Greenhouse Gas Worksheets
- Appendix F: Health Risk Modeling
- Appendix G: Risk of Upset Study
- Appendix H: Traffic Study
- Appendix I: Noise Calculations
- Appendix J: Transportation Feasibility Analysis
- Appendix K: Draft Excavation and Offsite Disposal Volume Estimate for Boeing Areas I, III, and Southern Buffer

CHAPTER 3
Project Description

3.1 Introduction

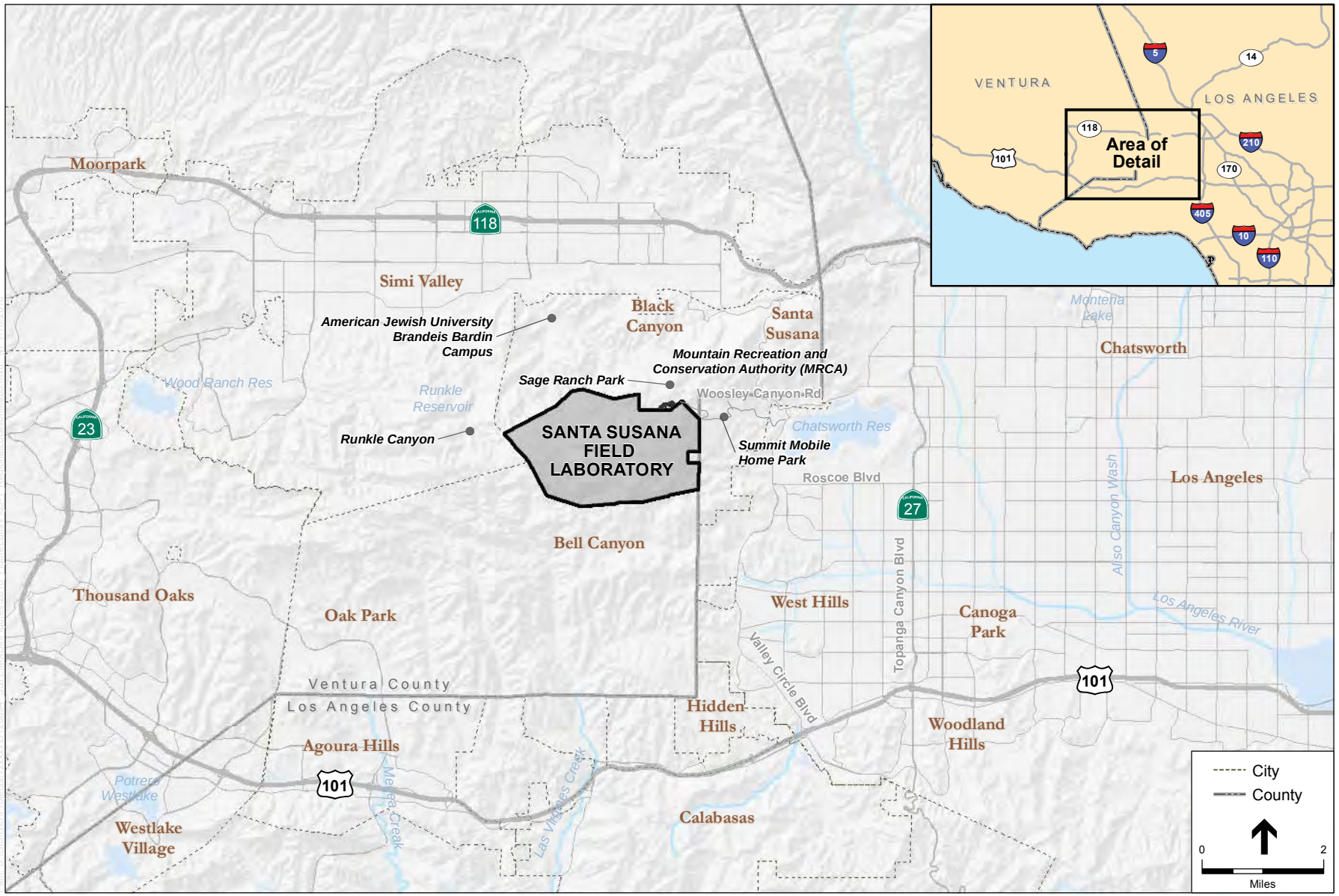
This chapter provides a detailed description of the proposed activities at SSFL that are the subject of this PEIR, including soil and groundwater cleanup requirements at the proposed project site.[1] The proposed project involves the approximately 2,850-acre SSFL site and adjacent offsite areas, located in the southeastern-most part of Ventura County (see **Figure 3-1**). Boeing, NASA, and DOE are the RPs for the investigation and cleanup of contaminants released from past activities at the project site.

The following sections discuss the project location, regulatory orders and cleanup requirements, the existing setting on the project site, the objectives to be achieved by the project, an overview of the soil and groundwater to be remediated, and a description of the proposed activities that would occur at the project site.

Section 3.6 provides a description of the program-level remediation activities, which includes the general cleanup strategies and methodologies being considered to clean up the affected media in a manner consistent with the 2007 Consent Order (DTSC, 2007a) and the 2010 AOCs. These activities and methodologies are described in varying levels of detail based upon current information and what is reasonably foreseeable. DTSC will evaluate whether implementation of these program-level remediation activities requires additional environmental analysis when cleanup decision documents are prepared.

Section 3.7 presents more definitive descriptions of the currently anticipated initial activities for this project. These activities are described and evaluated with a sufficient level of detail to currently allow for their implementation after public comment and DTSC approval of this PEIR and the corresponding cleanup decision document.

[1] Information in this chapter was developed in conjunction with DTSC and the RPs.



Source: ESA, ESRI, DeLorme (2015).

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Figure 3-1

Regional Location Map

3.2 Project Location

The approximately 2,850-acre SSFL project site is located in the southeastern most part of Ventura County and adjacent to Los Angeles County, approximately 29 miles northwest of downtown Los Angeles, California. Boeing and the federal government (under the administrative jurisdiction of NASA) own the SSFL property. **Table 3-1** summarizes the land owners, RPs, and acreages of each area, and **Figure 3-2** provides supporting illustration.

The city of Simi Valley is located approximately 1 mile to the north of the project site. Open space associated with the Upper Las Virgenes Canyon Open Space Area and Cheeseboro/Palo Comado Canyons is located to the west of the project site. The residential community of Bell Canyon is located directly south of the project site. San Fernando Valley communities, including Canoga Park, West Hills, and Chatsworth, in the city of Los Angeles are located to the east. Figure 3-1 shows the regional location of the project site and surrounding communities.

Regional access to the project site is provided via east-west State Route (SR) 118, which is located approximately 2 miles north of the project site and can be accessed by north-south Interstate 405 (I-405) and I-5 located east of the project site (see Figure 3-1). The east-west United States Route (US) 101 is located approximately 4.5 miles south of the project site and also provides regional access. Topanga Canyon Boulevard (SR 27) is located approximately 3.5 miles east of the project site and links SR 118 and US 101.

Local access to the project site is limited, and provided by Service Area Road at the northeast corner of the site, which can only be accessed by Woolsey Canyon Road from Chatsworth to the east or by Black Canyon Road from Simi Valley to the north.

As shown in Figure 3-2, the project site is divided into administrative Areas I through IV, and the Northern and Southern Undeveloped Areas (also referred to as buffer zones in other documents). These administrative areas generally represent land ownership, cleanup responsibility, and cleanup requirements, and are referenced in this document to provide approximate location information for cleanup requirements (as explained in more detail in Section 3.3) and features within the overall project site.

Table 3-1 includes the estimated acreages within each administrative area.

3.3 Regulatory Orders and Cleanup Requirements

As discussed in Chapter 2.0, *Introduction*, of this PEIR, the 2007 Consent Order and the 2010 AOCs establish the investigation and cleanup requirements for soil and groundwater at the project site.

TABLE 3-1
SUMMARY OF SSFL SITE OWNERSHIP AND RESPONSIBLE PARTY ACREAGES

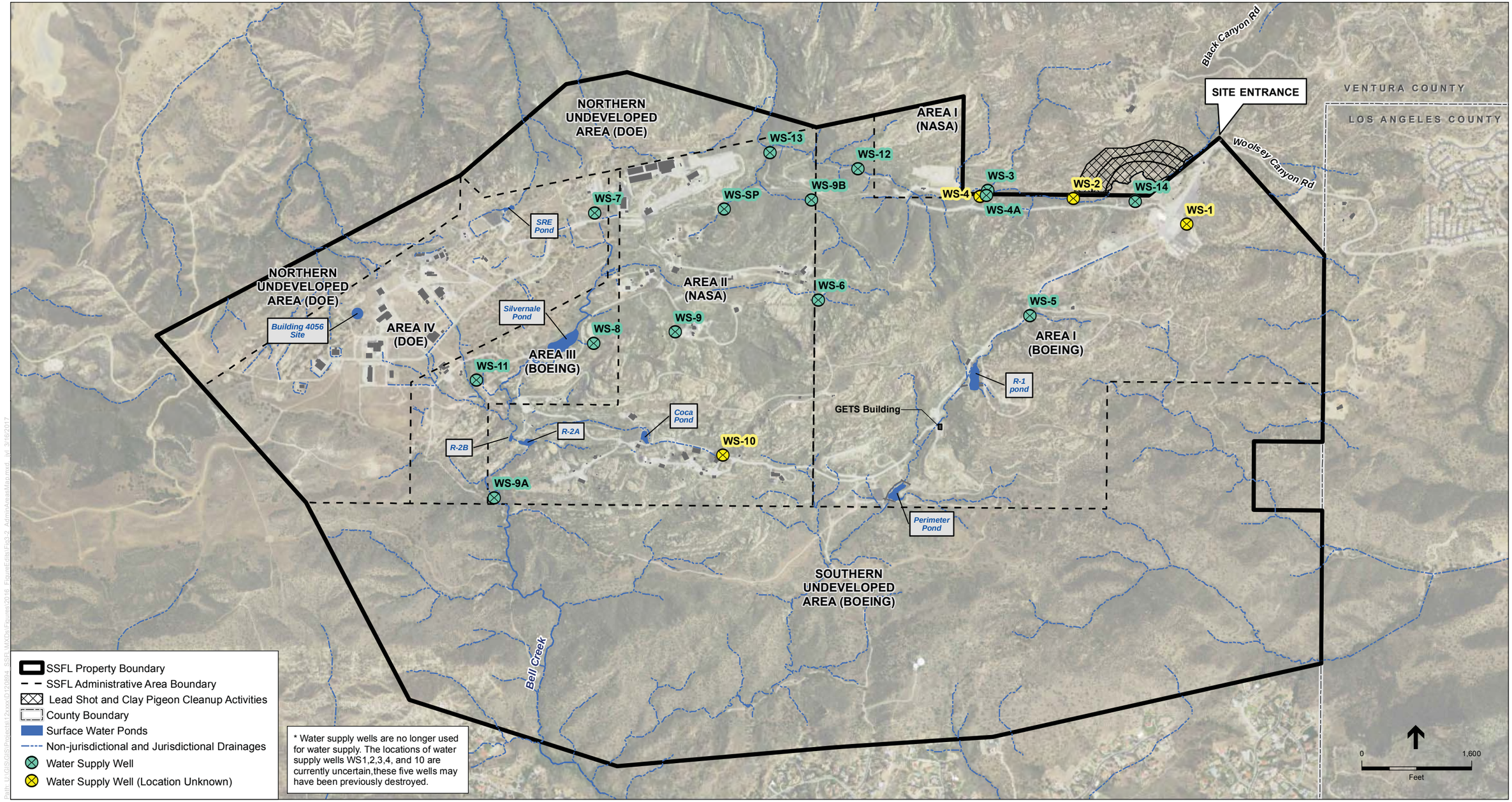
Administrative Area	Property Owner	Responsible Party [A]	Administrative Area Acreage [B]
I	Boeing	Boeing	672
I	Federal Government	NASA	42
II	Federal Government	NASA	404
III	Boeing	Boeing	119
IV	Boeing	DOE	290
Northern Undeveloped [C]	Boeing	DOE	182
Southern Undeveloped [C]	Boeing	Boeing	1,140
Total Project Site			**2,850[D]**

NOTES:
A. The RP designations refer to soil cleanup. The list of RPs may differ for groundwater cleanup depending on the source and migration pathways of affected groundwater.
B. Acreages are estimated and include all property within the area assigned to the identified RP.
C. The Northern and Southern Undeveloped Areas are also referred to as Buffer Zones in other historical documents.
D. The total site acreage is rounded to the nearest 10 to match historical documents, but the sum of the separate areas listed in Table 3-1 is actually 2,849 acres. Also, on December 1, 2009 the "Alta Survey" was conducted. The results of this survey are currently under discussion. Specifically, the east west trending boundary between Areas II and III and the boundary between the Liquid Oxygen Plant and the remainders of Area I may be subject to modification. The potential boundary changes, if accepted, are minor in scope and are unlikely to affect any conclusions in this document; however, this should be clarified in future documents in order to prevent inconsistencies specifically related to administrative area acreages.

The investigation and characterization efforts are the basis for estimating the SSFL areas that require cleanup. Generally, the SSFL site is composed of three types of area. The first type includes areas with known site operational activities (e.g., buildings, test stands, burn pits). The second type includes areas with no evidence of site operational activities (e.g., northern and southern buffer zones, rock outcrops). The third type includes areas where it is possible that releases may have occurred, but may not be a known operational area; DTSC refers to these as areas of concern. A facility assessment identified 122 areas of concern that required further investigation. DTSC directed the RPs to investigate their respective areas to identify the nature and extent of contamination related to the SSFL site operations. The investigation includes contiguous areas where contaminants may have migrated.

Data was collected from 135 SWMUs [2] and the associated areas of concern. Solid waste management units are defined as any part of a facility that may have released hazardous constituents. Since 2007, samples were collected from more than 15,000 sample boring locations and samples were collected at multiple depths at most locations. In addition, USEPA collected samples for radionuclides from over 3,500 sampling locations. The sampling determined the areal extent of contaminant migration and provides information to estimate soil volumes that would be cleaned up.

[2] SWMUs are defined as any part of a facility that may have released hazardous constituents.



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SOURCE: ESA; ESRI; Boeing 2016; MWH 2016

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Figure 3-2

Administrative Areas

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Until 2010, all three RPs were conducting their soil and groundwater investigations under the 2007 Consent Order. The 2007 Consent Order separates the project site into two OUs, the Surficial Media OU and the Chatsworth Formation OU (groundwater). The primary components of the Surficial Media OU include soil, sediment, and weathered bedrock. The Surficial Media OU also includes surface water, near-surface groundwater, air, and biota, as presented in **Figure 3-3**. The primary component of the Chatsworth Formation OU is deep groundwater. The Chatsworth Formation OU also includes unsaturated, unweathered bedrock.

In 2010, DOE and NASA each entered into their respective 2010 AOCs. The 2010 AOCs are not differentiated by OUs and apply only to soils, as defined in the 2010 AOCs. The 2010 AOC soil cleanup requirements for DOE and NASA areas are different from the 2007 Consent Order soil cleanup requirements for Boeing. However, the 2007 Consent Order still contains the groundwater cleanup requirements for all three RPs.

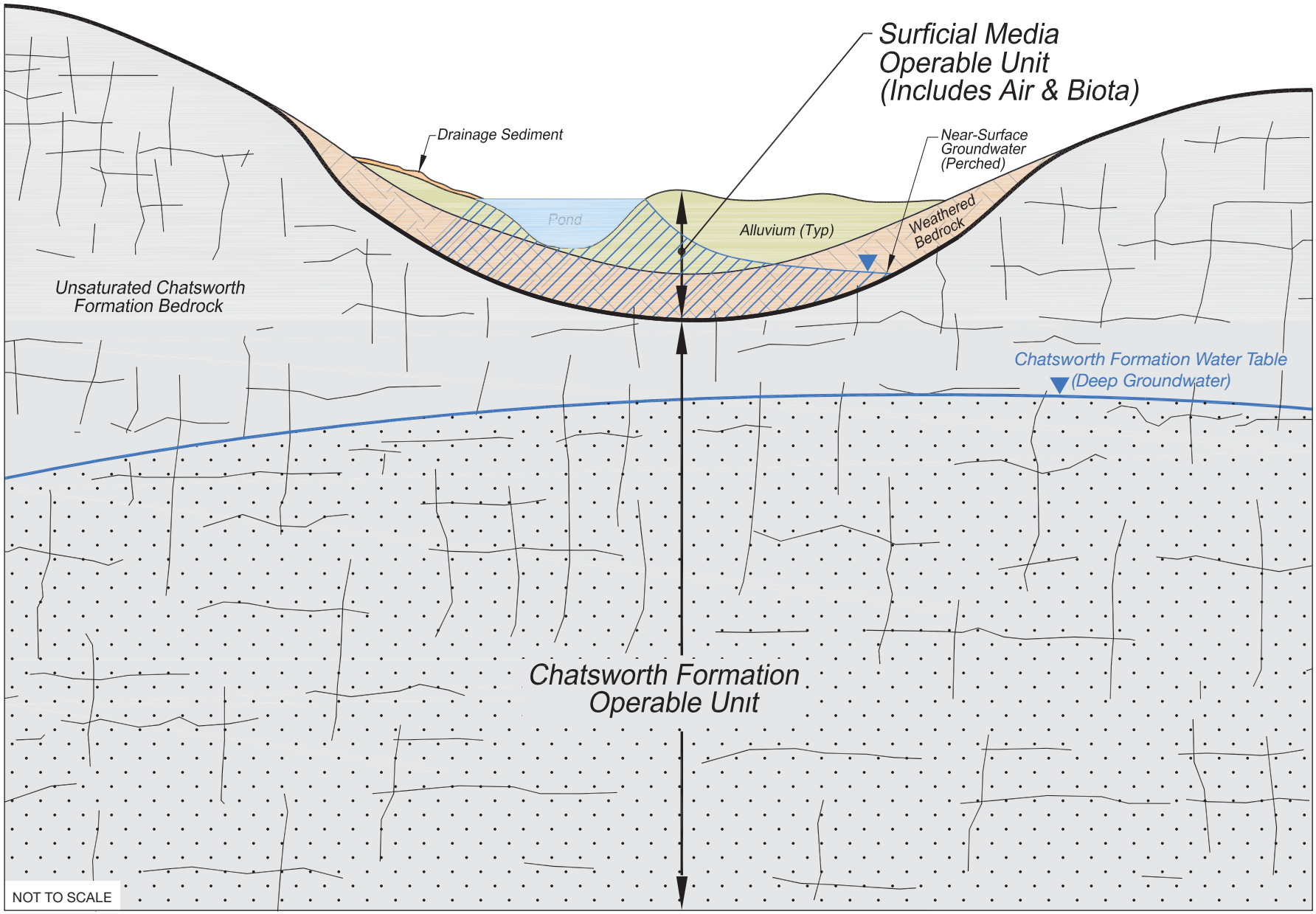
For the purposes of this PEIR, cleanup methods for soil, sediment, surface water, and weathered bedrock are grouped together, and groundwater (both near surface and deep groundwater) and unsaturated, unweathered bedrock are grouped together. These groupings are made in the PEIR for readability because cleanup technologies for these media are similar, as opposed to grouping by OU.

As set forth in the respective orders, the soil cleanup requirements for the project site are generally based on property administration. The soil cleanup requirements for the NASA and DOE areas are referred to as "AOC background" values, which are derived from the 2010 AOCs and are included in Appendix B of this PEIR. The 2010 AOC soil cleanup requirements are derived from background levels or laboratory method reporting limits,[3] but cultural and biological resources and other potential exceptions would be considered as described further in Section 3.3.1.

The soil cleanup requirements for Boeing's areas are based on risk-based levels (see Section 2.2.3.2, *Standardized Risk Assessment Methodology*, of this PEIR) pursuant to the 2007 Consent Order. DOE is responsible for Area IV and the Northern Undeveloped Area and, although that portion of the site is owned by Boeing, the 2010 AOC soil cleanup requirements apply to Area IV soils.

For the proposed project, the 2010 AOC cleanup standards for NASA and DOE soils are more restrictive than the cleanup standards Boeing is responsible for under the 2007 Consent Order.

[3] Method reporting limits for chemicals, minimum detectable concentration for radionuclides.



SOURCE: Adapted from MWH 2013

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Figure 3-3
Cross Sectional Depiction of Operable Units

Cleanup of contamination from Boeing areas onto DOE- or NASA-managed properties will require coordination between Boeing, and DOE or NASA, respectively, but the soil cleanup for the DOE- and NASA-managed areas is governed by the 2010 AOCs. DTSC will ensure cleanup levels are consistent with the respective 2007 Consent Order and 2010 AOCs as appropriate in each specific case where contamination crosses administrative responsibility areas.

If offsite impacts are identified in a project-specific cleanup plan, the respective RP(s), in conjunction with DTSC, would coordinate with affected offsite property owners during development of the proposed project-specific cleanup plan consistent with the respective 2007 Consent Order or 2010 AOC.

Any onsite or offsite decision on cleanup levels for affected property(ies) would be proposed in a project-specific draft cleanup decision document. This document will be provided to the public for review and comment. Thereafter, DTSC will approve a final project-specific cleanup decision document.

3.3.1 Soil

The soil cleanup requirements for the Boeing areas are derived from the 2007 Consent Order, which requires that soil and sediment be cleaned to risk-based levels developed following methods outlined in the DTSC-approved Standardized Risk Assessment Methodology Work Plan Addendum (summarized in Section 2.2.3.2, *Standardized Risk Assessment Methodology*, of this PEIR). Preliminary risk-based screening levels for soil and related media are provided in Appendix B of this PEIR.

As discussed in Section 2.2.3.5, *Soil Cleanup Requirements*, of this PEIR, site-specific considerations are used to develop, risk-based media cleanup levels under the RCRA corrective action and CERCLA cleanup programs. Those site-specific risk-based levels define clean closure, or indicate that a site cleanup is protective of human health and the environment. One of the site-specific considerations is applying the reasonably anticipated land-use scenario when developing risk-based cleanup levels.

For the SSFL cleanup, DTSC solicited input from the County of Ventura regarding zoning and anticipated land-use scenarios. The County provided a detailed summary of allowed land uses, including recreational, residential, and agricultural uses (County of Ventura, 2015). Based on this input, and following the Standardized Risk Assessment Methodology (SRAM), human health risk-based screening levels were developed for different Suburban Residential scenarios, including onsite garden scenarios.

The estimated soil cleanup volumes and acreage presented in this PEIR for the Boeing portion of SSFL were based on the Suburban Residential scenario that includes consumption of foods grown onsite comprising 25 percent of the residents' diets. This provides protection for all reasonably foreseeable and allowed future uses of this site and the approximate soil volume estimate for this PEIR. The final cleanup decision documents will specify the final cleanup levels applied at areas that Boeing is responsible for cleaning up.

As described previously, NASA and DOE soil and sediment will be cleaned to AOC background" levels. DTSC reviewed the investigation and characterization data and concluded they are reasonable for estimating soil treatment volumes to achieve the "AOC background" values. The respective project final cleanup decision documents will provide updated volume estimates for each cleanup project undertaken by DOE or NASA.

Both the 2007 Consent Order and 2010 AOCs state that actions taken pursuant to the orders must be conducted in accordance with local, state, and federal laws, including the 2007 Consent order and 2010 AOCs and laws and regulations related to protecting biological resources (habitat or species protected under the federal and state regulations) or cultural resources (e.g., Native American artifacts). These biological and cultural resources protections are described as "exemptions" in the 2010 AOCs and as "exceptions" in the Final Agreement in Principal (AIP).[4] For ease of reference, this PEIR uses "exceptions" to describe these protections for all RPs even though Boeing is not subject to the AOCs.

In addition, the 2010 AOCs have requirements that place limitations on remedial approaches. Specifically, the 2010 AOCs prohibit "leave-in-place" approaches such as onsite burial and landfilling of soil/sediments with contaminant concentrations above cleanup requirements; this limits cleanup options for areas under the responsibility of NASA and DOE. Areas subject to an "exception" are not considered a "leave-in-place" option or prohibited under the 2010 AOCs.

Table 3-2 includes the estimated acreages within each administrative area and offsite areas. Cleanup acreages would be finalized after the RPs' investigations of the areas are complete and cleanup requirements are approved by DTSC.

3.3.2 Groundwater

Groundwater at the site has been contaminated from surficial releases and spills, and dissolved contaminants have subsequently been transported by groundwater flow. The RPs have responsibility for the cleanup of contaminants in groundwater under the requirements of the 2007 Consent Order, and the groundwater cleanup requirements are the same for all areas throughout the project site. The groundwater cleanup requirements are based on regulatory limits or risk-based values where regulatory limits do not exist. Cleanup requirements for radionuclides are derived from USEPA as well as DOE regulations under authority of the Atomic Energy Act, and are based on USEPA-promulgated drinking water standards (maximum contaminant levels) as well as site-specific risk assessment values. The draft groundwater contaminant and radionuclide screening levels and LUTs are included in Appendix B of this PEIR.

[4] On September 3, 2010, DOE and NASA agreed to a Joint Settlement Framework in the AIP, which is incorporated into the AOCs as Attachment B. DOE and NASA agreed that their cleanup obligations with respect to soil contamination at the site shall be conducted in accordance with and be governed by the AIP. While the AOCs generally provide for "exemptions," these measures are defined in the AIP in detail and are referred to as "exceptions." As such, in this PEIR, DTSC refers to these provisions as "AOC exceptions" or "exceptions."

TABLE 3-2
SUMMARY OF PROJECT SITE OWNERSHIP, ACREAGE, AND CLEANUP RESPONSIBILITY

Administrative Area	Property Owner	Responsible Party [A]	Administrative Area Acreage [B]	Estimated Soil Cleanup Acreage [B, C]	Cleanup Requirement
SSFL					
I	Boeing	Boeing [D]	672	51	Risk-based
I	Federal Government	NASA [E]	42	14	AOC
II	Federal Government	NASA	404	193	AOC
III	Boeing	Boeing	119	15	Risk-based
IV	Boeing	DOE [E, L]	290	217	AOC
Northern Undeveloped [F]	Boeing	DOE [L]	182	12	AOC
Northern Undeveloped [F]	Boeing	NASA [H, M]	0	6	AOC
Southern Undeveloped [F]	Boeing	NASA [H, M]	0	12	AOC
Southern Undeveloped [F]	Boeing	Boeing	1,140	1	Risk-based
Subtotal - SSFL Acreage			**2,850 [K]**	**521**	
Offsite Areas					
Drainage Areas to the north	American Jewish University	DOE [L]	--	<1	AOC [I]
Drainage Areas to the north	American Jewish University	NASA [M]	--	<1	AOC [I]
Drainage Areas to the north [G]	Mountains Recreation and Conservation Authority	Boeing	--	<1	Risk-based [I]
Former Rocketdyne Employee Shooting Range	Mountains Recreation and Conservation Authority	Boeing [J]	--	9 [J]	Risk-based [I]
Subtotal - Offsite Areas			**0**	**<20**	
Total Project Site			**2,850 [K]**	**541**	

NOTES:
AOC = Administrative Order of Consent

A. The RP designations refer to soil cleanup. The list of RPs may differ for groundwater cleanup depending on the source and migration pathways of affected groundwater.
B. Cleanup acreages would be finalized after the RP investigations of the areas are complete, and cleanup decision documents are approved by DTSC.
C. Summary acreages are approximate, rounded to the nearest whole number and are based on the most recent available data.
D. Boeing soil cleanup volumes presented in this table represent a maximum volume estimate of soil/sediment requiring remediation. DTSC developed the estimate based on the Suburban Resident and 25 percent garden uptake. Additional detail on assumptions and calculations may be found in Appendix K. Further characterization and analysis may result in adjustments to these volume estimates; final soil volumes will be provided in the final decision documents.
E. The DOE and NASA estimated acreages do not account for any AOC exceptions or contingency. DTSC, after input from supporting regulatory agencies, may approve AOC exceptions consistent with the limitations on such exceptions, including the requirements stated in the existing applicable 2010 AOCs, 2007 Consent Order, and DTSC policy and provided they would not violate federal, state, or local laws and regulations, including CEQA Guidelines, to appropriately preserve biological and cultural resources. DTSC will make its decision regarding final remediation areas when approving cleanup decision documents and consider additional input during a separate public comment period associated with those documents. The first step in implementing an AOC exception would be to assess if there is an adverse impact in an area that qualifies for an exception. If there is no adverse impact, cleanup would commence. If an adverse effect that cannot be mitigated is identified, DTSC would consider implementing an exception.
F. The Northern and Southern Undeveloped Areas are also referred to as Buffer Zones in other historical documents.
G. Boeing soil cleanup acreages in the drainage areas to the north include impacts from operations and cleanup required under the 2007 Consent Order.
H. NASA proposed cleanup on Northern and Southern Undeveloped Areas is due to contiguous chemical impacts emanating from former NASA operations. NASA does not, and never has owned any portion of either undeveloped area. Cleanup levels for these areas would be determined based on applicable cleanup orders and property owner rights as described in Section 3.3 of this PEIR.
I. While the sediment sample results are above the "AOC background" values, they do not pose a threat to human health or the environment.
J. Lead shot removal cleanup activities to be performed by Boeing under DTSC oversight. Acreage provided based on approximate extent of lead shot and clay pigeons north of the drainage; cleanup locations would be based on ongoing characterization work.
K. The total site acreage is rounded to the nearest 10 to match historical documents, but the sum of the separate areas listed in Table 3-1 and Table 3-2 is actually 2,849 acres. Also, on December 1, 2009, the "Alta Survey" was conducted. The results of this survey are currently under discussion. Specifically, the east west trending boundary between Areas II and III and the boundary between the Liquid Oxygen Plant and the remainders of Area I may be subject to modification. The potential boundary changes, if accepted, are minor in scope and are unlikely to affect any conclusions in this document; however, this should be clarified in future documents in order to prevent inconsistencies specifically related to administrative area acreages.
L. DOE acreage estimates are based on Geographical Information System Data (DOE, 2014).
M. NASA acreage estimates are based on the Draft Data Summary Report, dated May 2015a.

3.3.3 RCRA Units

In addition to the 2007 Consent Order and the 2010 AOCs, DTSC currently regulates three RCRA permitted units and two interim status facilities (hazardous waste management facilities) at the project site. These five hazardous waste management facilities are listed below (see Section 2.2.3 for more detail, including numbers).

- TTF located in the southwestern portion of Area I (interim status)
- RMHF located in Area IV (interim status)
- HWMF located in Area IV
- Four Area II Surface Impoundments (Alfa Bravo Skim Pond, Storable Propellant Area 1 and Storable Propellant Area 2, and Delta)
- Five Area I/III Surface Impoundments (Engineering Chemistry Laboratory, Advanced Propulsion Test Facility 1, Advanced Propulsion Test Facility 2, System Test Laboratory-IV 1, and System Test Laboratory –IV 2)

The planning and implementation of the cleanup and post-cleanup monitoring for RCRA hazardous waste management facilities, referred to as "closure" and "post-closure," respectively, in the regulatory framework, are regulated under the 2007 Consent Order and the RCRA Hazardous Waste Facility Permitting Program. Section 3.7.4 provides additional details regarding the planned actions at each permitted unit.

3.3.4 Buildings and Infrastructure

The RPs intend to remove certain buildings and infrastructure at the project site (further described in Section 3.4.2) that are not part of the RCRA hazardous waste facilities described in Sections 3.3.3 and 3.7.4. In contrast to closure of the RCRA hazardous waste management facilities, the non-RCRA buildings and infrastructure are not subject to closure requirements under state or federal law regulating the management of hazardous waste. The Ventura County Building and Safety Division is the lead agency overseeing demolition of these buildings. DTSC has authority to stop demolition and disposal work activities that are in violation of the law or adversely impact DTSC-regulated soil and groundwater media at the project site. Such actions would be exercises of DTSC's enforcement authority and would not be discretionary decisions subject to CEQA.

The impacts from removing the non-RCRA SSFL buildings and infrastructure will be generally similar to certain impacts of the proposed soil cleanup. Common activities include the mobilization and operation of heavy construction equipment and the generation, transportation, and disposal of large volumes of debris and waste to offsite treatment, storage, and disposal facilities. The schedules for these activities may overlap with portions of the soil and groundwater cleanup program, and may therefore amplify the impacts analyzed in this PEIR.

DTSC has elected to provide enhanced descriptions of the current status and the planned removal/disposal actions for non-DTSC regulated DOE-owned buildings located within Area IV as part of this PEIR, but not for the NASA- and Boeing-owned buildings. The discussion of the DOE-owned buildings is presented in Section 3.7.3. DTSC believes this enhanced level of

discussion in the PEIR is merited due to the location of, and anticipated timing for the demolition of the remaining SSFL Area IV buildings.[5] NASA issued its Record of Decision in April 2014 to proceed with demolition and such demolition is ongoing and therefore, NASA's demolition is not evaluated or described in this PEIR as part of the proposed project. Demolition of Boeing's buildings is neither required by DTSC nor subject to DTSC approval. However, impacts from Boeing's and NASA's demolition activities are included in the cumulative analysis of this PEIR.

The PEIR description of these particular buildings and infrastructure in no way: (1) establishes or implies that DTSC has discretionary authority in the demolition process; (2) impacts Ventura County's general building and permitting authority with regard to Boeing-owned buildings within Area IV; or (3) undermines DOE's discretionary authority regarding the building removal program under NEPA. Finally, the extent of DTSC's authority over the demolition of Boeing-owned buildings in Area IV is the subject of a lawsuit pending in Superior Court of California (County of Sacramento, Case No: 34-2013-8001589). The PEIR references to DOE- and Boeing-owned buildings and infrastructure within Area IV, as they relate to the environmental analysis, provide background information only. Those references do not indicate that DTSC has discretionary authority over buildings and infrastructure which, as in this case, are not associated with hazardous waste activities.

3.3.5 Lead Shot and Clay Pigeon Cleanup Activities

North and adjacent to the project site is the former Rocketdyne-Atomics International Rifle and Pistol Club Trap and Skeet shooting range area, located on the Mountains Recreation and Conservation Authority (MRCA) Sage Ranch Park (Figure 3-1). The former shooting range was used by former Rocketdyne-Atomics International employees for recreational shooting and target practice using lead shot and clay pigeons between 1972 and 1991. Visible lead shot in portions of the former shooting range area has been addressed through several periodic cleanup operations conducted by Boeing (or its predecessor companies) since 1992.

This area is identified as SWMU 4.20, the "Former Rocketdyne Employee Shooting Range" in the RCRA Facility Assessment by USEPA (SAIC, 1994), and is listed as such in the 2007 Consent Order. In Attachment 4 of the 2007 Consent Order, the Former Shooting Range is listed as a SWMU. However, no RP is listed and it is noted as "NA" (Not Applicable) for "Regulatory Jurisdiction," "Current Regulatory Program," and "Current Status" with the comment, "Included in RCRA Facility Assessment but the property belongs to Santa Monica Mountains Conservancy." The investigation and any future cleanup activities for the Former Rocketdyne Employee Shooting Range would be conducted under DTSC oversight pursuant to the 2007 Consent Order.[6]

This PEIR includes an evaluation of expected remediation activities for this area.

[5] The remaining Area IV buildings are a mixture of former radiological sites owned by DOE and Boeing, with separate responsibilities and independent schedules. These Area IV building removals are also the subject of a court order and an ongoing legal suit filed in 2013.

[6] These cleanup requirements were clarified and memorialized in a letter from M. Malinowski (DTSC) to D. Dassler (Boeing) dated May 17, 2016.

3.4 Environmental Setting

The following section provides a description of the current conditions at the project site, including existing infrastructure onsite (e.g., buildings and test stands, roads, utilities) in order to familiarize the reader with the current conditions at the site.

3.4.1 SSFL Project Site

The SSFL project site occupies approximately 2,850 acres of hilly terrain near the crest of the Simi Hills. The site comprises areas of open space, much of which is in an undisturbed natural condition, and developed areas that include roads, buildings, and other infrastructure associated with its past use as a scientific research and test facility (see Figure 3-2). The site is designated as Open Space (OS) and zoned as Rural Agriculture (RA-5) (administrative Area I through IV) and Open Space (OS-160) (Northern and Southern Undeveloped Areas) in the Ventura County General Plan, which governs the use of the site.

The highest surface elevation at the project site occurs near the center at an approximate elevation of 2,250 feet above mean sea level (AMSL), along two general ridges that trend northeast-southwest. The lowest elevation within the project site occurs at the eastern property boundary in Dayton Canyon and has an elevation of approximately 1,180 feet AMSL. The lower elevations at the project site occur primarily along the eastern, southern, and north-central to northwestern perimeters of the property. A broad, relatively flat area of topography exists within the northwestern portion of the project site and is referred to as the Burro Flats area.

The geologic units within the project site are predominantly bedrock of the Chatsworth Formation, with smaller areas of the Santa Susana, Simi Conglomerate, Las Virgenes, and Calabasas Formation sediments. All are composed mostly of sandstone with some siltstone, shale, and conglomerate. The rocks in the vicinity of the project site have undergone folding and faulting since deposition. Alluvial sediments have accumulated over about 11 percent of the project site, generally limited to topographic lows and ephemeral streams.

Vegetation throughout the project site is composed of various coastal sage scrub and chaparral plant communities, oak woodland, mulefat scrub, and annual grassland. Substantial portions of the site are located within areas of exposed bedrock or previously developed areas with little or no vegetation; in particular, where paved and unpaved roads are maintained or various infrastructure is present. Other portions of the project site have undergone demolition, interim cleanup actions, and restoration activities, including hydroseeding, and, in some locations, replanting with native species.

Numerous ephemeral stream channels and drainages, as well as seeps and springs, are present throughout the project site (see Figure 3-2). Most surface water is intermittently present only during the winter rainy season and is conveyed offsite via one of four drainage areas: the Northwestern, Northern, Happy Valley, and Southern. Operational water from cooling and rinsing during past engine tests and extracted groundwater was historically discharged to the southern drainages, which are monitored as required by the NPDES permit as described in

Section 3.4.2.9, below. The majority of the surface water (estimated at approximately 60 percent) from the SSFL runs off the southern property boundary through several southern drainages into Bell Creek, which subsequently discharges into the Los Angeles River (LARWQCB, 2015).

There are seven surface water ponds within the project site, as shown in Figure 3-2. These ponds are identified as the R-1 Pond, Perimeter Pond, two R-2 Ponds (R2A and R2B), Silvernale Pond, Sodium Reactor Experiment Pond, and Coca Pond. In addition to these seven ponds, there is surface water contained within the Building 4056 excavation site. The R-1 Pond, Perimeter Pond, and Sodium Reactor Experiment Pond are typically dry.

3.4.2 Infrastructure

3.4.2.1 Buildings and Test Stands

NASA: The NASA Area II project site has various buildings, features, and inactive test stands. Some of NASA's buildings and test stands are in the process of being removed pursuant to approval by the appropriate regulatory agencies. NASA would demolish all buildings and features that have been determined to not be eligible for listing in the National Register of Historic Places, including those within the NASA SSFL historic districts (Alfa, Bravo, and Coca), and would demolish the entirety of the Coca Test Stand Historic District. NASA would retain and preserve one of the remaining test stands and control house and possibly other contributing buildings and features within the related historic district (Alfa or Bravo).[7] Demolition of these NASA buildings and test stands is not subject to DTSC approval, and given that NASA issued its Record of Decision in April 2014 to proceed with demolition at SSFL and that such demolition is ongoing, it is therefore not evaluated or described in this PEIR as part of the proposed project. However, impacts from this action are included in the cumulative impacts analysis of this PEIR. The March 2014 SSFL Final EIS, prepared by NASA under the requirements of NEPA, includes a full analysis and description of the planned NASA demolition program for SSFL Area II.

Boeing: Boeing has completed the demolition and removal of all buildings and other features in Areas I and III, except for the guard shack, fire station, and GETS building (located within Area I), which may be left for future use. Boeing has also completed the removal of all non-radiological buildings it owns in Area IV. The remaining Boeing features in Area IV, which are not subject to RCRA, are the former Fast Critical Experiment Lab/Advanced Epithermal Thorium Reactor building (B4100); the former Organic Moderated Reactor/Sodium Graphite Reactor (B4009); the former Nuclear Materials Development Facility (B4055, B4155); the former Instrument Calibration Lab (B4011 Low Bay); and the remaining concrete slab from the former Uranium Carbide Manufacturing Building (B4005). There are no existing or former buildings or test stands in Boeing-owned Northern and Southern Undeveloped Areas. Impacts from removal of these features are included in the cumulative impacts analysis of this PEIR.

[7] At the time of this report preparation NASA has acknowledged a public petition for the Federal Government to preserve the SSFL engine test stands, and has adjusted their demolition schedule in recognition of these efforts.

DOE: The remaining DOE buildings in Area IV are the Sodium Pump Test Facility[8] (B4462, B4463); the Energy Technology and Engineering Center office (B4038); the sodium test/warehouse (B4057); the HWMF (B4029, 4133); the RMHF (Buildings B4021, 4022, and 4034 and sheds B4044, B4075, B4563, B4621, B4658, B4665, and B4688, as well as the remaining concrete slab of B4663); and former reactor buildings (B4019, B4024). The RMHF is in a standby status and is no longer handling or processing radioactive or hazardous materials; B4057 is still used for storage; and the remaining buildings are unoccupied and unused. Closure and removal of the DOE buildings associated with the HWMF and the RMHF[9] falls within DTSC's discretionary authority. Therefore, impacts from the removal of these buildings are evaluated and described in Section 3.7.4 of this PEIR. In addition, the Boeing and DOE buildings which remain within the boundaries of Area IV are further described in Section 3.7.3.

3.4.2.2 Roads

The project site includes a network of paved and unpaved roads. Local access to the site is from the east on Woolsey Canyon Road or Black Canyon Road from the north to Service Area Road at the northeast corner of the site. The Southern Undeveloped Area has several unpaved dirt roads. The Northern Undeveloped Area has unpaved dirt roads that are used to access remote undeveloped areas during wildfires and to conduct monitoring activities.

3.4.2.3 Water Supply

Water for the project site is provided by the Calleguas Municipal Water District to the water supply tank north of the entrance to the site. Existing water supply lines provide water directly to various existing buildings, which is used for sanitation, fire suppression, and dust control purposes. Onsite personnel use water dispensers for drinking water purposes. There are former water supply wells located within the project site, as shown in Figure 3-2; most of these wells still exist but are not used for water supply. Records indicate that former water supply wells were used for water supply and groundwater monitoring. Water supply well WS9A was also used for groundwater remediation. Some of the former water supply wells are currently available for groundwater extraction as part of the project's Groundwater Interim Measures or for groundwater monitoring. As part of site closure activities, the majority of these former water supply wells would be properly decommissioned in accordance with existing regulations. Some former water wells may be used for ongoing monitoring, extraction, or injection as part of the final groundwater cleanup remedy.

3.4.2.4 Electrical

Southern California Edison (SCE) provides electricity to the project site from the Chatsworth Substation located in Area IV. Electricity from Chatsworth Substation is distributed to three smaller substations in Area I and Area II via aboveground transmission lines. At the present time,

[8] DOE owns the Sodium Pump Test Facility and Boeing is responsible for the removal of the slab beneath that facility.

[9] Only specific features (Buildings 4021, 4022, and 4621 and Mixed-Waste Storage Yard) within the RMHF are authorized by DTSC RCRA Hazardous Waste Permitting Program; the remaining features were for support of the RMHF operations, but were not used to directly handle or treat hazardous or mixed waste for disposal purposes.

electricity is not supplied to or has been disconnected from most buildings; however, the majority of the existing transmission lines and transformers are still in service and/or energized. Prior to and following cleanup activities, unneeded electrical infrastructure may be removed.

The SCE substation, along with easements for its electrical system, would remain until SCE decides otherwise. There is no indication that SCE plans to remove the substation in the foreseeable future.

3.4.2.5 Communication System

The primary communication link for network and telephone systems at the project site is provided by SCE via an aboveground fiber optic communication line to Building 1319, located in Area I. AT&T provides a backup to the primary network via underground cables that run from Woolsey Canyon Road to Building 1319. Wireless coverage is available at some locations. Antennas to support wireless communications are located in a limited number of areas, including two on the Ventura County Radio Tower located in Area I.

3.4.2.6 Sewer Pipelines and Leach Fields

Septic tanks and their associated leach fields were used at SSFL until approximately 1961, when an integrated sewer system was installed and implemented. Three sewage treatment plants provided treatment for most of the sanitary sewer waste at the site: the Area I Sewage Treatment Plant (STP-1), the Area II STP (STP-2), and the Area III STP (STP-3). Currently, sewage within Area I is diverted to STP-1, where it is stored in a subsurface concrete container prior to transport offsite for disposal.

Sewer pipelines extend throughout Areas I, II, III and IV. The sewer pipelines are vitreous clay and cast iron, with ductile iron and steel force mains. Pipeline diameters range from 2 to 10 inches, with the majority of the segments 4 and 6 inches in diameter. The depth of the pipelines is generally 3 to 5 feet below grade, with some pipelines up to 10 feet deep in portions of the site. Some sewer system pipelines are also above the ground surface. All aboveground sewer pipelines would be removed by the RPs, below ground sewer pipelines would be either removed or decommissioned in place.

Several inactive sanitary leach fields are located within Areas I, II, and III. If these leach fields are co-located with soil requiring cleanup, they would be removed during site cleanup requirements; otherwise, leach fields would be left in place. Nineteen inactive leach fields have been identified (known and potentially occurring) within Areas I and III. Of these 19 leach fields, 6 are listed as unknown location (MWH, 2012). The RMHF leach field located in Area IV has been affected by strontium-90 and it is currently under investigation by DOE. Investigation of other leach fields has been completed and those with impacts above applicable cleanup requirements will be addressed. Specific cleanup methods will be defined in the cleanup decision documents.

3.4.2.7 Natural Gas

Natural gas service to the site was discontinued in 2014. The natural gas lines were decommissioned in place on easements held by the Southern California Gas Company. Below-grade branch lines have been decommissioned in place in Areas I, II and IV. Boeing may remove remaining natural gas lines or other facility gas lines located in Area I, III, or IV.

3.4.2.8 Existing Groundwater Extraction and Treatment System

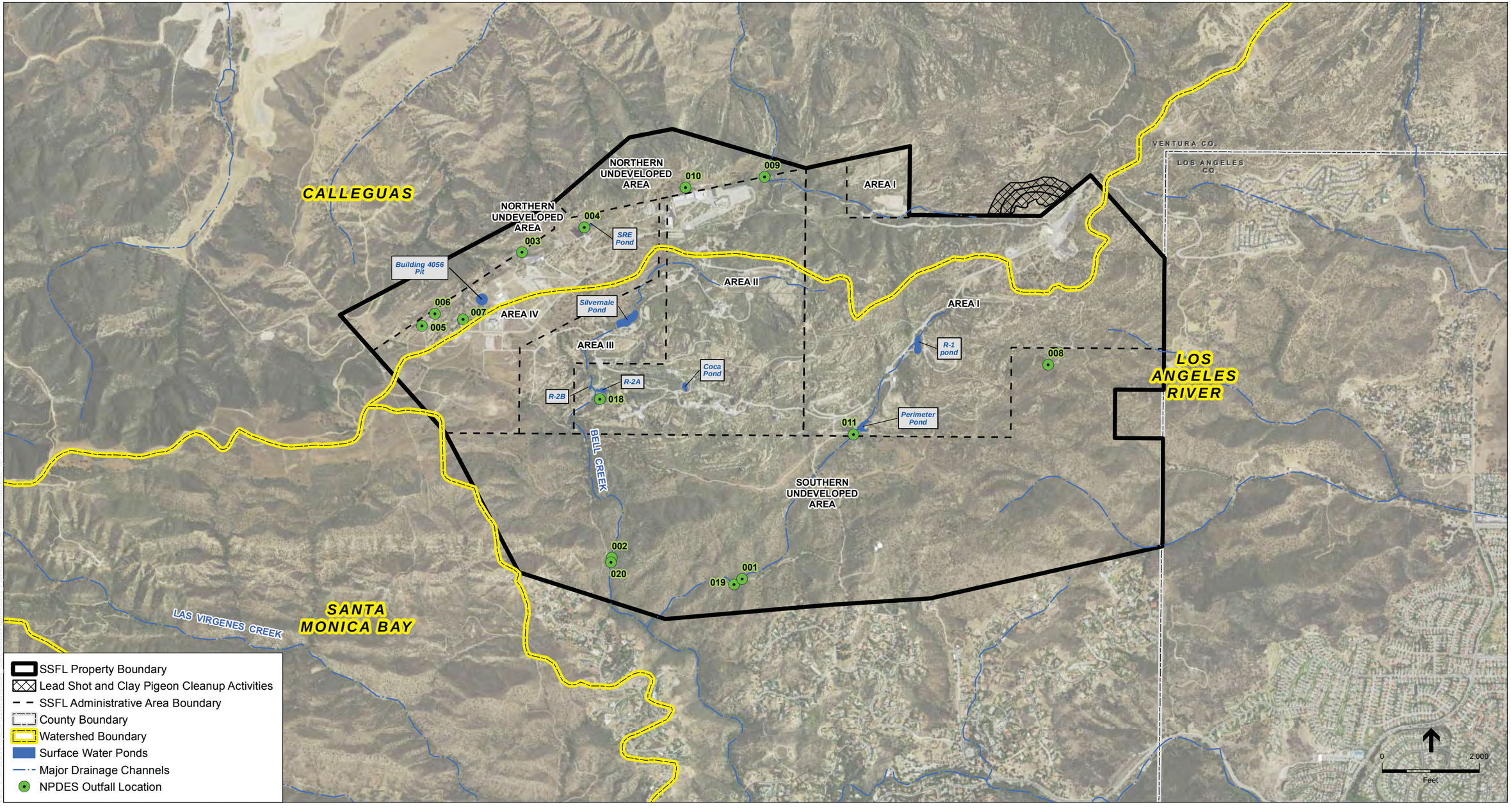
The GETS was constructed in 2009 by Boeing, under DTSC's direction and approval of Groundwater Interim Measure (GWIM) Work Plans. The GETS started initial operation in January 2010. It is has not operated since November 2012 due to lowered groundwater levels and is scheduled to resume operation as final construction and permitting of the GWIM is completed in the Spring 2017. The GETS is located in the southern portion of Area I (see Figure 3-2). Treatment consists of filtration, ion exchange, air stripping with vapor-phase carbon treatment, liquid-phase carbon adsorption, and ultraviolet light and peroxide treatment. Treated groundwater, to be discharged, would continue to be released to Outfall 19 in accordance with the existing NPDES permit and in compliance with applicable regulatory requirements or would be reinjected into the groundwater aquifer. See Section 3.6.3.1 for a detailed description of the GETS.

3.4.2.9 Existing Surface Water Treatment Systems

Stormwater treatment at the project site is governed by the Waste Discharge Requirements (WDR) and NPDES permit issued to Boeing (Order No. R-4-2015-033, NPDES No. CA0001309) by LARWQCB.[10] Changes to the operation of existing surface water treatment systems that require a streambed alteration agreement would be coordinated by the respective RP, with LARWQCB, CDFW and DTSC.

Although the current NPDES permit is issued to Boeing, it governs the entire SSFL site, and DOE and NASA support compliance with its provisions as discharges from their activities are also covered by the permit. The NPDES permit addresses discharges at 14 outfalls: Outfalls 008 and 011 serve watersheds where Boeing's activities occur; Outfalls 003, 004, 005, 006 and 007 serve watersheds where DOE's activities occur; Outfall 010 serves the watershed where NASA's activities occur; Outfalls 001 and 009 serve watersheds where Boeing and NASA activities occur; and Outfalls 002 and 018 serve watersheds where Boeing, DOE, and NASA activities occur. Outfalls 019 and 020 could be used by Boeing and NASA to discharge treated groundwater from the GETS. Outfalls are illustrated on **Figure 3-4**.

[10] The WDR Order and NPDES Permit was issued on February 23, 2015, and may be found at: http://www.waterboards.ca.gov/losangeles/board_decisions/adopted_orders/year.shtml



SOURCE: ESA; ESRI; Boeing 2015

Santa Susana Field Laboratory. 120894

Figure 3-4

Onsite Outfalls

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Both active and passive methods for treating surface water are used at SSFL to meet NPDES permit requirements. Active treatment is performed on water collected in the onsite ponds using two surface water treatment systems that employ filters and chemical treatment. A passive biofilter treatment system has been implemented that uses soil, naturally occurring bacteria, and native plants to filter the surface water. The RPs have also implemented drainage culvert modifications, stream bank stabilization, revegetation of disturbed soil areas, installation of detention bioswales, and placement of smaller-scale erosion control measures to comply with NPDES requirements.

Each of the RPs would implement separate surface water control and monitoring measures established by the NPDES or other regulatory program in the watersheds where they are performing the activities addressed by this PEIR.

3.4.3 Surrounding Land Uses

Areas located adjacent to the project site include open space and the following cities and residential neighborhoods: (1) Simi Valley to the north and northwest; (2) Bell Canyon to the south; and (3) Canoga Park, West Hills, and Chatsworth to the east and northeast, respectively. Brief descriptions of the current land uses adjacent to the project site are presented below. Figure 3-1 shows the project site and the surrounding properties.

- Northwest – The adjacent property located to the northwest is occupied by the American Jewish University and is zoned as rural agricultural on Ventura County zoning maps. The specific land use permit conditions for the American Jewish University indicate that this property contains religious, teaching, and camping facilities.

- Northeast – The adjacent property, Sage Ranch Park, located to the north of the east side of the project site is occupied by the Santa Monica Mountains Conservancy, managed by the Mountains Recreation and Conservation Authority, and zoned as Agricultural Exclusive (AE) per Ventura County zoning. The former recreational trap and target shooting range for SSFL employees is located on the southern portion of Sage Ranch Park near the site.
- East – Land uses located immediately adjacent to the east of the project site are zoned light agricultural per Los Angeles County zoning, with variances that permit higher-density use. Summit Mobile Home Community is located approximately one-quarter mile east of the project site boundary in Woolsey Canyon.
- South – Land uses to the south of the project site within Ventura County include open space and residential (Bell Canyon). Additional residential development is located in the San Fernando Valley (Los Angeles County) about 5 miles southeast of the project site.
- West – The majority of properties located adjacent to the west of the project site are designated by the Ventura County General Plan as open space. The Runkle Canyon property located immediately west of the project site is primarily open space with residential uses located on the northern portion.

3.5 Project Objectives

Past activities at SSFL have resulted in the release of contaminants to soil and groundwater. In support of DTSC's directive and commitment to protect human health and the environment, DTSC has directed the RPs to investigate the nature and extent of the releases and implement corrective actions to clean up the affected areas. The primary objective of the proposed project is to implement SSFL cleanup under the 2007 Consent Order and the 2010 AOCs. As part of implementing the Orders, under Health & Safety Code 6.8, Section 25356.1, DTSC is required to base any decision on the USEPA National Contingency Plan and associated USEPA guidance documents to implement the 2007 Consent Order and the 2010 AOCs. In addition, per USEPA regulation (OSWER Directive 9355.7-19, March 17, 2010), DTSC considers the reasonably anticipated future land use of the site during the remedy selection process.

DTSC's overall project objectives are based on the National Contingency Plan (40 CFR 300.430 (e)(9)(iii)) criteria. These are grouped into three categories: primary, or "threshold," criteria; secondary, or "balancing," criteria; and additional "modifying" criteria.

Assessments against the following two of the criteria relate directly to statutory findings. Therefore, these are categorized as primary or "threshold criteria" that each alternative must meet:

1. Protect human health and the environment, attain soil and groundwater cleanup standards, and control of source(s) of releases. This can be done by ensuring exposure pathways are controlled, eliminated, or reduced through treatment, engineering controls, or institutional controls.
2. The cleanup for soil and groundwater must comply with applicable, relevant and appropriate laws, regulations and requirements.

To aid the decision making bodies in their review of the project and the environmental impacts and alternatives to the cleanup, the following criteria are assessed and considered:

3. Long-term effectiveness and reliability (after remedial activities are complete) in protecting human health and the environment (inclusive of surrounding communities) from exposure to materials containing contaminants above applicable cleanup requirements.
4. Reduction of toxicity, mobility, and/or volume of contaminated media.
5. Short-term effectiveness (during implementation/construction activities) in protecting human health and the environment (inclusive of surrounding communities) from exposure to materials with contaminants above applicable cleanup requirements.
6. Ability to implement the remedial activities, including feasibility to construct and operate, administrative feasibility and availability of services and materials.
7. Remediate the site in an expedient and cost-effective manner.
8. Community input during a formal public comment period on the cleanup decision document.

The following are some SSFL-specific elements of the above criteria:

- For contaminants that have already migrated offsite (e.g., groundwater), prevent further migration of the contaminants and mitigate any exposure pathways.
- For soils, continue to prevent the migration of contaminants that pose a threat to offsite areas.
- Implement the proposed project in a manner that is compatible with Ventura County's reasonably anticipated future land use designation of the property.
- Recognize the unique biological and cultural significance of the project site through protection of resources to the extent practicable and consistent with applicable laws and regulations for such resources.
- Use in situ methods, to the extent practicable, to minimize physical impacts to the environment.

3.6 Overall Site Cleanup

As a part of the investigative process, an initial screening of potential remedial approaches and technologies to clean up contaminated soil and groundwater at SSFL has been conducted. The RPs, under the direction of DTSC, are continuing to evaluate the approaches and technologies as they complete characterization of the nature and extent of the contaminants. The PEIR includes an evaluation of remedial technologies necessary to address the different types of contaminated land and water resources, the wide variety of contaminants present, and the unique and varied conditions at the site (topography, vegetation, access, sensitive biological and cultural resources, etc.).

While the PEIR includes an initial assessment of the estimated extent and location of each remedial technology based on the activities proposed by each of the RPs, DTSC may approve final remediation methods that revise these initial assessments. To provide for flexibility in the design of the final cleanup strategy, the information regarding each of the proposed remedial technologies is presented in the sections that follow, and the subsequent environmental analysis presents an evaluation of potential impacts with consideration of different strategies or methodologies. Additional environmental analysis is included for a set of initial activities (as described in Section 3.7) proposed for the site (as described in Section 2.1.2, *Future Review of Project-Level Designs*, of this PEIR) based on the greater level of detail that was available for the initial activities at the time this PEIR was prepared.

Future development of the site is not a part of the proposed project; therefore, impacts of future development of the site are not evaluated in this PEIR. The purpose of the project is to remove contamination from soil and groundwater to safeguard human health and environmental quality, including by cleaning up the land and improving the quality of surface waters, groundwater, and downstream receiving waters. When overseeing cleanup actions that are protective of human health and the environment, consistent with USEPA regulations and guidance (OSWER Directive 9355.7-19, March 17, 2010), DTSC considers the reasonably anticipated future land use of the site during the remedy selection process. The proposed project would not change the current use of the site and the proposed cleanup level would not conflict with the allowable uses identified for the RA-5, AE-40 and OS-160 zones.

The groundwater remedies may include restrictions that would require DTSC approval prior to any future groundwater use or production well installation. Any future site development would be subject to other discretionary actions by the County of Ventura or other government agencies (potentially including DTSC, depending on the circumstance), including environmental review as appropriate pursuant to CEQA.

3.6.1 Soil Remediation

As discussed in Section 3.3.1, *Soil*, of this PEIR, DTSC reviewed and assessed the investigation and characterization data. The final cleanup decision documents will specify the final cleanup levels that will be applied for the Boeing cleanup. The estimated soil cleanup volumes and acreage presented in this PEIR (see Tables 3-2 and 3-3) for the Boeing portion of SSFL are based on the Suburban Residential with garden consumption of 25 percent of total diet and provide an approximate volume estimate for this PEIR.

DTSC reviewed the investigation and characterization data and concluded that the volume and acreage estimates provided by DOE and NASA (see Tables 3-2 and 3-3) are reasonable estimates to achieve the "AOC background" values. The respective project final cleanup decision documents will provide updated volume estimates for each project.

Based on the assessment, roughly 541 acres (see Table 3-2) at the project site or in immediately adjacent areas are targeted for some level of remedial action. A variety of remedial technologies would be considered for soil cleanup, depending on the results of the treatability studies. A description of the proposed soil remediation techniques is presented in the following subsections for:

- Excavation and Offsite Disposal
- Soil Vapor Extraction
- Biological Treatment
- Phytoremediation
- Physical Remediation Methods (soil washing/partitioning; soil solidification/stabilization; thermal desorption)
- Capping and Onsite Management (Boeing only)

Table 3-2 summarizes the estimated soil volumes slated for remediation. **Figure 3-5** shows the footprint of the soil areas to be remediated. Certain areas of contaminated soil are located within sensitive biological resources (habitat or species specifically protected under the federal or state regulations; based on the CEQA Guidelines; or Ventura County ordinances, management plans, or general plan) or cultural resource (e.g., Native American or paleontological artifacts) zones. In these areas, remediation options may be more limited and cleanup goals may be adjusted to accommodate the protection of such resources. As described in Section 3.3.1, both the 2007 Consent Order and 2010 AOCs require cleanup actions to be taken in accordance with local, state, and federal laws, including laws and regulations that protect biological and cultural resources. These biological and cultural resources protections are described as "exceptions" in the 2010 AOCs. For ease of reference, this PEIR uses that terminology to describe these protections

for all RPs, even though Boeing is not subject to the AOCs. The exercise of these exceptions is subject to DTSC's oversight and approval.

Impacted soils that may be exempted by the AOC exceptions to preserve biological and cultural resources would be evaluated on a case by case basis based on degree of soil impact and value of the resource in the cleanup decision documents. The DOE and NASA volumes are preliminary estimates subject to DTSC approval, and the Boeing volume estimates were developed by DTSC, based on available data to date.

TABLE 3-3
ESTIMATED SOIL REMEDIATION VOLUMES

Remediation Method	Boeing [A,B]	DOE [A,C]	NASA [A,D]	Total [A]
Excavation & Offsite Disposal	390,000	1,260,000	870,000	2,520,000
Monitored Natural Attenuation	TBD [E]	TBD [E]	TBD [E]	150,000 [E]
Soil Vapor Extraction [B]	500,000	-	-	500,000
In Situ Biological Treatment [B, F]	15,000	-	-	15,000
Ex Situ Biological Treatment [B,G]	16,000	-	-	16,000
	921,000	**1,260,000**	**870,000**	**3,201,000**

A. All volumes in this table are rounded to three significant digits and refer to cubic yards (CY) for in situ soils. Variations in the overall volume assumptions are based on individual RP characterization information and DTSC's review of these documents, as well as individual site cleanup strategies as described below.
B. Boeing soil cleanup volumes presented in this table represent a maximum volume estimate of soil/sediment requiring remediation. DTSC developed the estimate based on the Suburban Resident and 25 percent garden uptake standard. Additional detail on assumptions and calculations may be found in Appendix K. Further characterization and analysis may result in adjustments to these volume estimates; final soil volumes will be provided in the final cleanup decision documents.
C. The DOE soil cleanup volumes presented in this table represent conservative volume estimates based on information provided in DOE, 2015. The estimate reflects a greatest degree of impact scenario because it includes areas that maybe in sensitive cultural and biological conservation areas that may be subject to exception. Also, the estimate for monitored natural attenuation (MNA) represents the volume of soil where it is anticipated that chemical impacts would be reduced through natural processes and such progress would be actively monitored and confirmed by the RPs under DTSC oversight. Further justification and evaluation of the appropriateness of each anticipated action will be presented in final cleanup decision documents. DOE's excavation volume of 1,260,000 CY in this table is different from the 2017 DOE EIS volume of 933,000 CY because DOE assumed application of an AOC exception to 330,000 CY of soil; but DTSC's estimated excavation volume for DOE represents cleanup to "AOC background" values, which does not include application of exceptions.
D. NASA's soil volume represents a change from the 500,000 CY that was presented in NASA's March 2014 EIS, because the 2014 value was an estimate based on preliminary data. The current estimate of 870,000 CY is presented in NASA, 2015d and is considered a greatest degree of impact scenario because it includes areas that maybe in sensitive cultural and biological conservation areas that may be subject to exception. The soil volume estimate is subject to further refinement during development of cleanup decision documents.
E. The amount of soil that would be treated through MNA has not yet been determined for Boeing, DOE, and NASA. A volume estimate and evaluation of the appropriateness will be presented in the cleanup decision documents. For purposes of the PEIR, the disposal volume assumes that 150,000 CY of the total would be amenable to MNA.
Although the amount of soil that would be treated through MNA has not yet been determined, MNA would address a portion of the soil volumes currently identified for cleanup and no additional soil volume is expected to be identified.
F. Includes anaerobic and aerobic methods.
G. Includes land farming, oxidation, and thermal desorption.
CY – cubic yards.
TBD – to be determined.

Figure 3-6 shows the general footprints of sensitive biological species and habitats. These are areas that need to be further evaluated to determine what portions of these areas may be considered for possible exception on a project specific basis. This figure documents the whole of the area subject to biological protections under CEQA guidance and local, state and federal rules and regulations. In order to maintain confidentiality of locations of significant cultural value, and as required under California Public Resource Code 15120(d), Figure 3-6 does not show footprints for cultural exception areas.

Cleanup decision documents would identify the specific final soil cleanup areas and volumes earmarked for exception, and the reasoning for such, based on level of contamination and resource value. For cultural exception areas, only the reasoning not the specific locations, would be presented in order to prevent future damage to resources. Additional details regarding biological and cultural resources are presented in Section 4.3, *Biological Resources* and Section 4.4, *Cultural Resources*, of this PEIR.

The remediation volumes in Table 3-2 represent a conservative, upper-range estimate of soil potentially requiring cleanup. This estimate presents an upper-range scenario since it includes areas that may be in sensitive cultural and biological exception areas, and does not include cleanup by in situ remediation methods other than by biological or natural attenuation remediation methods. **Table 3-4** presents a breakdown of the estimated volumes of non-hazardous, hazardous, and radiological/mixed soil wastes requiring offsite disposal. Final soil volume estimates will be published in draft cleanup decision documents.

TABLE 3-4
ESTIMATED VOLUMES OF SOIL WASTE TYPES

	NASA		DOE		Boeing		Total	
Soil Waste Type	**Soil (CY)**	***Trucks*** [B]	**Soil (CY)**	***Trucks*** [B]	**Soil (CY)**	***Trucks*** [B]	**Soil (CY)**	***Trucks*** [B]
Nonhazardous [A]	148,000	*9,650*	1,120,000	*73,300*	310,000	*20,220*	**1,580,000**	***103,000***
Hazardous [A]	696,000	*45,400*	49,000	*3,200*	63,000	*4,110*	**808,000**	***52,700***
Soil exceeding Provisional Rad LUT [A]	26,000	*1,700*	91,000	*5,940*	0	*0*	**117,000**	***7,640***
Radiological/Mixed [A]					17,000	*1,110*	**17,000**	***1,110***
Total	**870,000**	***56,800***	**1,260,000** [C]	***82,400***	**390,000**	***25,400***	**2,520,000**	***164,000***

NOTES: All soil volumes in this table are presented as CY and are rounded to three significant digits
All soil volumes presented are estimates as described in Section 3.6.1 and Table 3-3.

A. Soil waste type ratios are based on historical interim source removal actions and correspondence between each RP and DTSC (NASA, 2015c; Boeing, 2015a; DOE, 2017).
B. Truck trips calculated assuming truck volume capacity of 15.33 CY per truck (23 tons per truck load, and 1.5 tons per in situ CY of soil). Values are rounded to the nearest 10.
C. As presented in Table 3-2, DOE's disposal volume assumes that 150,000 CY of the total 1,410,000 CY would be remediated by monitored natural attenuation.

NORTHERN UNDEVELOPED AREA

AREA I

NORTHERN UNDEVELOPED AREA

AREA IV

AREA III

AREA II

AREA I

SOUTHERN UNDEVELOPED AREA

SSFL Property Boundary
SSFL Administrative Area Boundary
Proposed Soil Remediation Area
Lead Shot and Clay Pigeon Cleanup Activities
Potential Soil Borrow Area
Potential Soil Vapor Extraction Area
Proposed Staging Area
Potential Ex Situ Bio Treatment Area

Note: Areas within the Soil Remediation Areas not identified for soil vapor extraction or biotreatment would be excavated and disposed of at an offsite facility. Some cultural exception areas are being evaluated but are not identified to protect those resources.

0 1,500
Feet

Path: U:\GIS\GIS\Projects\12xxxx\D120894_SSFL\MXDs\Figures\2016_FigureEdits\Fig3-5_ProposedSoilCleanup.mxd jyl 3/31/2017

SOURCE: ESA 2016; Boeing 2016; DOE 2012; NASA 2016

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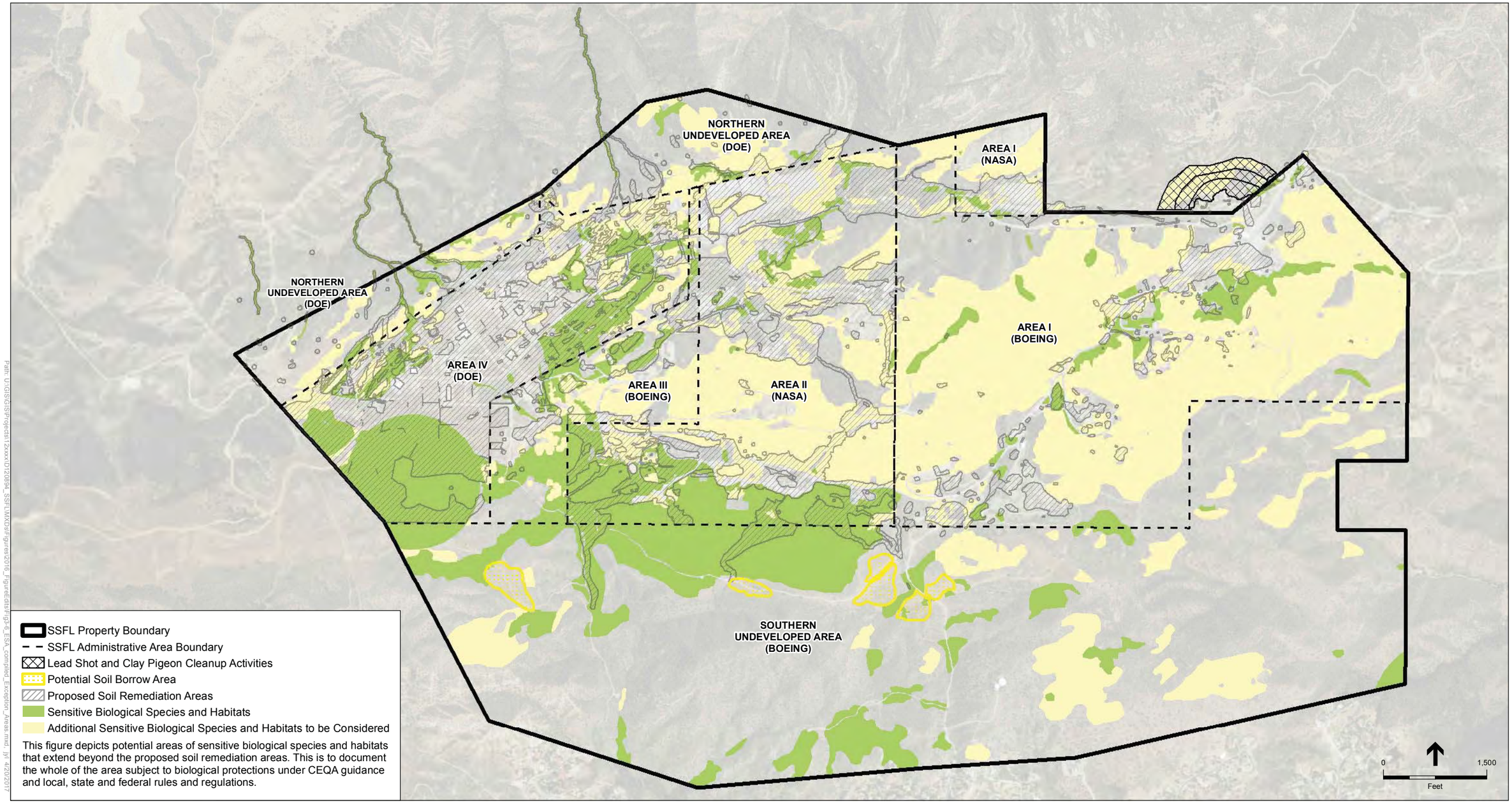
Figure 3-5

Proposed Soil Cleanup Areas



SOURCE: DOE 2012; Boeing/MWH 2016; USFWS 2016; ESA 2016

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Figure 3-6

Potential AOC Exceptions Areas

The daily maximum number of trucks visiting the site for export and import of materials would be 96 round trips (resulting in 192 total trips) in total for all RPs combined, for 15 years. This maximum would represent all types of truck trips, including: equipment deliveries, excavation spoils, building demolition debris, and delivery of backfill soil. For planning purposes, it is assumed that the actual number of trucks would range between approximately 48 truck trips (round trips) and a maximum of 96 round trips. This predicted variability is based on factors such as scheduling, the complexity of various projects stages (building removal, excavation, backfilling, confirmation sampling, etc.), coordination between multiple RPs, determination of final soil excavation volumes, and project initiation and ability to ramp up overall production given the nature of the SSFL project as a whole.

Reclamation would consist of limited backfilling, grading, and revegetation as necessary. **Table 3-5** summarizes the estimated volumes of backfill that may be imported to the site.

TABLE 3-5
ESTIMATED BACKFILL SOIL VOLUMES

	Boeing [A]		DOE [B]		NASA [A]		Totals	
Source	Soil	*Trucks*	Soil	*Trucks*	Soil	*Trucks*	Soil	*Trucks*
Imported Backfill	129,000 [C]	*8,400*	947,000	*61,800*	290,000 [D]	*18,900*	**1,370,000**	***89,100***
Onsite Backfill	0[E]		0		0		**0**	***0***
Grand Total							**1,370,000**	***89,100***

NOTES: All soil volumes are in CY for in situ soils and are rounded to three significant digits.

A. Boeing and NASA estimate backfill volume to be approximately 1/3 of the total excavation volume (Areas I, II, III, and Southern Undeveloped Area) (NASA, 2014), (MWH, 2015).
B. DOE estimates backfill volume to be approximately 75 percent of the total excavation volume (Area IV and Northern Undeveloped Areas). The additional backfill percentage compared to Boeing's and NASA's areas is to account for deeper excavations required in DOE's areas of responsibility (DOE, 2017).
C. Boeing has identified potential offsite backfill sources from Santa Paula Materials Inc., Grimes Rock, Tapo Rock and Sand Inc., P.W. Gillibrand Company and Simi Valley Landfill (clean soils from landfill expansion) if approved by DTSC.
D. DTSC is working to ensure that DOE and NASA conduct a thorough survey of potential sources of backfill that meets AOC requirements.
E. Boeing has identified approximately 160,000 CY of soil from borrow areas in the Southern Undeveloped Area that may be available for backfill for Boeing projects if approved by DTSC. As a mitigation measure, onsite backfill would be utilized to the extent practicable (see Mitigation Measure TRANS-1 in Section 4.11 of this PEIR.

3.6.1.1 Excavation and Offsite Disposal

Much of the soil identified for excavation and removal contains multiple contaminants. In some cases, an onsite remediation method (e.g., soil vapor extraction [SVE] or other in situ treatment) would be unable to reduce concentrations of the contaminants contained in the soil to below cleanup requirements; meaning that excavation and offsite disposal would be the only feasible remediation technique. As shown in Table 3-2, excavation and offsite disposal would be used for remediating most of the soil with contaminant concentrations above cleanup requirements. Excavation would involve the physical removal of the affected soil from the project site, hauling to an offsite disposal facility, partial backfilling to generally restore previous topographic grades and slopes without creating ponding, surveying (to document final excavation and restoration/backfill conditions), and vegetation restoration.

To support the overall volume of soil that would need to be removed from the project site and the overall level of activity that would be required, both onsite and offsite road improvements, as well as post-cleanup road repairs and decommissioning, may be required. Onsite staging areas would be designated for soil stockpiling and equipment storage.

The following provides a description of each of the main components of soil excavation and offsite disposal. As described previously, excavation and backfilling is only one of several potential soil remediation technologies. In the remaining portions of this section, the soil remediation areas identified for possible excavation and backfilling in the initial screening step by the RPs are described and displayed in figures. However, depending on the results of the cleanup decision documents and soil treatability tests, these areas may be revised.

Excavation and Backfilling

Excavation to remove soil with concentrations above cleanup requirements would occur at designated areas throughout the project site, as shown in Figure 3-5. Vegetation removal activities would include clearance (cutting aboveground plant material) and grubbing (removing belowground plant material), per applicable local, state, and federal environmental laws. Soil above cleanup requirements would be removed, stockpiled, and then loaded into storage bins and hauling vehicles to be transported from the site to the appropriate designated facility, as described below. Removed vegetation would be shredded and kept onsite to use as mulch to the extent feasible, but some may be disposed offsite.

Excavation areas would be backfilled and contoured to mimic natural topography and minimize ponding. A portion (30 to 75 percent) of the soil volume excavated would be replaced with backfill. Such backfill would be placed, as necessary, to stabilize deeper excavation areas, restore a natural topography and drainage pattern and to assist in revegetation measures. The purpose of partial backfilling is to reduce the volume of truck traffic hauling backfill to the project site. Maintenance and monitoring of areas subject to revegetation/restoration would be conducted as described later in this section.

Supplemental backfill soil would primarily be obtained from offsite sources and supplemented as practicable with soil from onsite sources (see Table 3-5 and Figure 3-5) that meet DTSC-approved cleanup requirements. DTSC is working to ensure that DOE and NASA conduct a thorough survey of potential sources of backfill that meets AOC requirements. A small portion of backfill for DOE excavation areas may come from excavated bedrock within Area IV and a small portion of backfill for NASA excavation areas may come from clean crushed concrete associated with onsite demolition activities; both are subject to DTSC approval.

The potential onsite soil-borrow areas are located adjacent to existing dirt roads (see Figure 3-5). Vehicle and equipment staging areas would be located at several locations within the site, as shown in Figure 3-5. Temporary soil stockpiles may be located within a 25-foot zone around each cleanup area.

Construction Equipment and Staging

Construction equipment would include dozers, loaders, excavators, scrapers, on-highway trucks, vacuum trucks, compactors, a mobile centrifuge dewatering unit for saturated sediments in ponds, water trucks, street sweepers, and light-duty trucks. Dust-control measures would be implemented by each RP, in accordance with regulatory guidelines, for its respective areas to reduce and control the generation of dust from excavation activities and soil stockpiles. Water for dust control would be supplied from the onsite water supply system, treated GETS water, or from offsite sources. Vehicles and equipment staging areas would be stationed at various locations within the project site. Excavated soil may be placed directly in trucks and transported to the soil staging areas, or may be temporarily staged within a 25-foot zone around each cleanup area.

To prevent runoff and offsite migration, stockpiles would be contained through the use of best management practices (BMPs) consistent with Ventura County Grading regulations, which may include the use of silt fences, hay bales, coconut rolls, and/or plastic covering of inactive stockpiles. Soil management plans describing waste characterization, soil handling procedures, and stockpile and container management would be prepared by each RP and approved by DTSC prior to implementing the cleanup activities.

Soil Removal and Transport

Removal of soil from the site would require the use of various types of heavy equipment throughout cleanup activities, and would result in a substantial number of truck trips to and from the project site. The existing onsite road network is adequate to access locations that require cleanup at the project site.

Heavy equipment that would be used during soil removal activities would likely include, but is not limited to, tracked excavators, front end loaders, bulldozers, water trucks, dump trucks, etc. Light-duty vehicles such as pickup trucks and other support vehicles would also be used during the soil removal activities.

Five-axle semi-tractor trailer trucks and/or semi-tractor trailer end dumps would be the primary vehicles to haul soil between the site and offsite disposal facilities. Approximately 48 trucks (round trips, resulting in 96 total trips) to a daily maximum number of 96 trucks (round trips, resulting in 192 total trips) would visit the site for export of excavated soil and demolition debris and import of equipment and backfill material in total for all RPs combined. To ensure vehicular safety at the entrance and exit points of the site, each RP would have a Traffic Management Plan, which would include a traffic control plan, parking plan, cleanup traffic operations, truck safety plan, hazardous materials transport plan, and ridesharing plan that would be updated to include the proposed project activities.

Prior to leaving the site, each truck would be inspected and decontaminated as necessary to remove loose debris in tire wells and on the truck exterior. Only certified hazardous waste transportation contractors would be used to transport material that is characterized as hazardous. Trucks would travel to SR 118 or US 101 via the following routes, as shown in **Figure 3-7**:

- Woolsey Canyon to Valley Circle Boulevard to Roscoe Boulevard to Topanga Canyon Boulevard (SR 27) to SR 118
- Woolsey Canyon to Valley Circle Boulevard to Lake Manor Drive to Valley Circle Boulevard to Plummer Avenue to Topanga Canyon Boulevard (SR 27) to SR 118
- Woolsey Canyon to Valley Circle Boulevard to US 101
- Woolsey Canyon to Valley Circle Boulevard to Roscoe Boulevard to Topanga Canyon Boulevard (SR 27) to US 101

Disposal

Table 3-6 lists the potential disposal facilities considered for disposal of soil, sediments, and other remediation-related wastes to be removed from the site and identifies the different waste types that each facility would accept: non-hazardous waste, hazardous waste, and wastes with radionuclides. Even though a facility may accept a variety of waste types, any combination of facilities may be used for offsite disposal. The RPs would use a variety of factors, to determine which disposal facilities to use, such as waste acceptance criteria, cost, proximity, and availability, among other considerations. Because of the anticipated volume of soil designated for offsite disposal, one or more of the listed facilities might be used for disposal.

Soil and sediments meeting the criteria for hazardous waste would be placed in labeled U.S. Department of Transportation (USDOT)-specified containers or vehicles for disposal at one or more of the facilities listed in Table 3-6 as accepting hazardous waste. Non-hazardous soil and sediments would be disposed of at one or more of the facilities listed in Table 3-6 as accepting non-hazardous waste. DOE and NASA soil and sediments with radionuclides at concentrations at or above the AOC cleanup standard would be placed in appropriately labeled USDOT and United States. Nuclear Regulatory Commission (USNRC)-specified containers for disposal at one or more of the listed facilities in Table 3-6 that have been licensed or approved to accept low-level radioactive waste (LLRW). Boeing soil and sediments that are radiologically impacted would be managed and disposed of at one or more of the listed facilities in Table 3-6, depending on the concentration of radionuclides.

SOURCE: ESA 2016; Boeing 2016

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Figure 3-7

Proposed Haul Routes

TABLE 3-6
POTENTIAL DISPOSAL FACILITIES

Disposal Facility	Location	Distance from SSFL (trucking miles)	Type of Waste	RP[A]
Antelope Valley Landfill	Palmdale, CA	57	Non-hazardous	Boeing, DOE
Azusa Land Reclamation	Azusa, CA	54	Non-hazardous	NASA
Chiquita Canyon Landfill	Castaic, CA	36	Non-hazardous	All RPs
Clean Harbors Aragonite (incineration facility)	Aragonite, UT	680	Non-hazardous and hazardous NRC license-exempt material Utah permit only allows for acceptance of radioactive wastes or materials with a count rate of less than three times the background value	Boeing
Clean Harbors Buttonwillow	Buttonwillow, CA	125	Non-hazardous and hazardous	Boeing, DOE
Clean Harbors Colfax	Colfax, LA	1,760	Non-hazardous and hazardous	Boeing
Clean Harbors Deer Park	La Porte, TX	1,610	Non-hazardous and hazardous	Boeing
Clean Harbors Deer Trail	Deer Trail, CO	1,090	Non-hazardous and hazardous naturally occurring radioactive material (NORM) and technologically enhanced naturally occurring radioactive material (TENORM)	Boeing
Clean Harbors Grassy Mountain	Grassy Mountain, UT	698	Non-hazardous and hazardous Nuclear Regulatory Commission license-exempt material. Utah permit only allows for acceptance of radioactive material that is not licensable by the Utah Division of Radiation Control or the Nuclear Regulatory Commission, or waste found to have a count rate as measured one inch from the surface that exceeds background by less than 40 microR/hr	Boeing
Clean Harbors Westmoreland	Westmoreland, CA	228	RCRA Class I, II, II (hazardous)	Boeing, DOE
DeMenno Kerdoon	Compton, CA	53	Non-hazardous aqueous	NASA
Energy Solutions	Clive, UT	690	Class A low-level radioactive waste and mixed waste (radioactive and hazardous)	Boeing, DOE, NASA
Evoqua Water Technologies	Vernon, CA	45	Hazardous aqueous	Boeing, NASA
Chemical Waste Management, Kettleman Hills Facility	Kettleman Hills, CA	181	Non-hazardous and hazardous	Boeing
Kramer Metals	Vernon, CA	46	Non-hazardous	DOE
La Paz County Landfill	Parker, AZ	324	Non-hazardous and hazardous	NASA
Lancaster Landfill & Recycling Center	Lancaster, CA	74	Non-hazardous	Boeing
McKittrick Waste Treatment Site	McKittrick, CA	138	Non-hazardous	Boeing, DOE
Mesquite Regional Landfill	El Centro, CA	263	Non-hazardous	DOE

Disposal Facility	Location	Distance from SSFL (trucking miles)	Type of Waste	RP[A]
Nevada National Security Site	Southeastern Nye County, NV	337	DOE-generated low-level radioactive waste only; non-DOE use only under special arrangements with DOE	DOE
Simi Valley Landfill and Recycling Center	Simi Valley, CA	14	Non-hazardous	Boeing, NASA
Soil Safe	Adelanto, CA	97	Petroleum-based contaminated waste	NASA
Southwest Treatment Systems, Inc.	Vernon, CA	45	Non-hazardous (liquids)	Boeing
Standard Industries	Ventura, CA	36	Non-hazardous scrap metal	DOE
US Ecology, Beatty	Beatty, NV	291	Non-hazardous and hazardous	Boeing, NASA
US Ecology, Richland	Richland, WA	1,070	Non-hazardous and hazardous NRC license-exempt material, NORM and naturally occurring and/or accelerator-produced radioactive material (NARM) from any US compact states [B]	Boeing
US Ecology, Grand View	Grandview, ID	897	Non-hazardous, hazardous, and NRC License-exempt material, NORM and TENORM	Boeing

Notes:
A RP column designates current proposed disposal facility for each RP based on RP business interests. Any of the disposal facilities would likely accept waste regardless of RP status.
B LLRW from California is not accepted at US Ecology Richland. Only LLRW from the Northwest and Rocky Mountain Compact states are accepted at this facility and California is in the Southwest Compact.
C DTSC will consult with California Department of Public Health Services, Radiologic Health Branch (CDPH) when evaluating final disposition and disposal facility selection for all waste from SSFL.

NRC – Nuclear Regulatory Commission.
NORM – naturally occurring radioactive material.
TENORM – Technologically enhanced naturally occurring radioactive material.
DTSC would consult with CDPH regarding soil disposal at all facilities.

Dewatering

Seven ponds (R-1 Pond, two R-2 Ponds, Perimeter Pond, Silvernale Pond, Coca Pond, and Sodium Reactor Experiment Pond, shown in Figure 3-2) may contain sediment above cleanup requirements that would be removed and disposed of at an offsite disposal facility. If surface water is present, the removal activity would require saturated sediment excavation and dewatering. Remediation of pond sediment would occur, to the extent possible, in the dry summer months to minimize the volume of saturated sediment processing. The sediment would be excavated and the water in the saturated sediment would be separated using a centrifuge or similar dewatering method. The dewatered sediment would be hauled to an offsite disposal facility. The supernatant (separated water) from the dewatering system may be treated onsite or disposed of offsite. If treated onsite, the supernatant would be trucked to the existing stormwater treatment systems in Area I or Area III before discharge as regulated by the stormwater NPDES program. If not treated at an onsite stormwater treatment system, the supernatant would be placed in labeled USDOT-approved containers for transport to the above-listed disposal facilities, or potentially sent for treatment at Southwest Treatment Systems, Inc., in Vernon, California. Restoration of excavated pond areas would include reestablishing natural drainage conditions. Vegetation restoration is discussed below.

Restoration

As previously noted, excavation areas would be graded and backfilled to allow for natural surface water drainage and to prevent ponding. Excavation areas would be partially backfilled using surrounding adjacent clean soil, supplemented with imported clean backfill soil. It is anticipated that up to one-third of the excavation volumes in areas under Boeing and NASA responsibility (Area I, Area II, Area III, and Southern Undeveloped Area) and up to three-quarters of the excavation volumes under DOE responsibility (Area IV and the Northern Undeveloped Area) would be backfilled using imported fill and/or native soil from offsite borrow sites, or onsite borrow locations. DOE areas would require additional backfill to account for the deeper proposed excavations that cannot be easily worked into the surrounding natural contours of the area.

Seeding and/or planting of vegetation, and irrigation, would be conducted, as needed, at disturbed areas that previously had vegetation. Most areas that currently lack vegetation would not be revegetated except in areas where a vegetative cover would stabilize disturbed soil. Water for irrigation would be supplied by existing water supply systems or by water trucks. Restoration would occur in conformance with site-specific restoration plans. Revegetated areas would be maintained and monitored for percent vegetation cover and to manage invasive species following procedures outlined in applicable restoration plans to be approved by CDFW.

For those areas where topsoil is available, the disturbed area would be revegetated by transplanting or reseeded using an approved seed mix via drill, broadcast, or hydro seeding techniques, depending on the slope or remoteness of the disturbed area. The CDFW-approved native seed mix would be developed to expedite native plant establishment and to reduce erosion; consequently, it may not contain the same composition of plants currently onsite.

In conjunction with reseeding and when topsoil is unavailable, soil stabilization BMPs would be used, including soil binders, erosion mats, and erosion control check dams. Soil amendments also would be used to help in the reseeding success. Appropriate restoration measures would be prescribed based on the location, slope, and remoteness.

In addition, a Stormwater Pollution Prevention Plan (SWPPP) would be implemented to guide erosion control methodology. Per air quality regulations, dust control measures would be developed and presented in plans approved by applicable regulatory agencies to minimize dust migration.

3.6.1.2 Soil Vapor Extraction

SVE is considered to be a potential remediation technology for VOCs in soil, where VOCs are the only contaminants present or where SVE would reduce the volume or toxicity of soil to allow reduced remediation by other methods (i.e., excavation and disposal). The approximate areas that are proposed to be cleaned up using SVE are shown in Figure 3-5. Based on existing data for soil vapor plumes, the total in situ volume of soil identified for potential SVE remediation would be approximately 500,000 CY (Table 3-2).

Soil Vapor Extraction System

SVE involves vacuum removal of VOCs, using vertical extraction wells, followed by ex situ treatment of the extracted vapors. The feasibility of this remediation option is being evaluated and would be implemented to the extent practical depending on the results of the cleanup decision documents. The soil vapor system would involve approximately 150 extraction wells installed within the soil vapor plume areas in accordance with applicable laws and regulations. The wells would be screened, vertically, within the areas of maximum detected VOCs and would range in depth from 10 to 35 feet, depending on the depth interval of VOCs at each well. Given the topographic conditions of the site, SVE would be conducted with multiple systems. Each SVE system would consist of a blower/vacuum to extract soil vapor, equipment to treat soil vapor to local air quality criteria, and transfer piping from each well to the associated SVE system. The systems would be housed on a fenced concrete pad of approximately 20 feet by 25 feet. The majority (approximately 65 percent) of the potential SVE treatment areas are in the northern portion of Area I.

Piping for each of the treatment systems would typically consist of polyvinyl chloride (PVC) trunk lines to each extraction well manifold. The piping from each SVE well to the manifold would be PVC. At the SVE treatment areas, appropriately rated piping or hoses would be required for interconnections.

An SVE capture system is used to extract and treat the VOC-laden vapors from the vadose zone. At the surface, the extracted VOC-laden air is treated using granulated activated carbon (or other air-treatment technologies) prior to releasing the treated air into the atmosphere following applicable air quality and other laws and regulations. Liquid condensate from the air vapor would be captured prior to granulated activated carbon treatment for offsite disposal.

The duration of SVE operation is estimated to be up to approximately 3 years for a site area. SVE effectiveness would be monitored regularly, and once SVE cleanup is considered complete, SVE system operation would be suspended.

Soil Vapor Extraction Decommissioning

After SVE treatment is complete, each system would be decommissioned, or moved to another area that requires treatment. SVE treatment times may vary, and not all systems would be decommissioned at the same time. The SVE wells would be destroyed in accordance with applicable laws and regulations by overdrilling the wells and then pressure grouting the borehole.

The concrete pads associated with the cleanup areas would be excavated and removed along with piping and surface completions for each well. The excavation would be backfilled with soil and clean fill as needed to match the surrounding grade. Concrete and debris related to well destruction may be recycled or disposed of at appropriate facilities as previously described in Section 3.6.1.1.

Restoration

After removal of the SVE infrastructure during decommissioning, the disturbed areas would be restored. The restoration and revegetation procedures would be the same as for restoring the excavation areas, described in Section 3.6.1.1.

3.6.1.3 Biological Treatment

Many chemicals (total petroleum hydrocarbon (TPH) perchlorate, PAHs, etc.) in soil may be addressed by biological treatment. Biological treatment (including bioaugmentation and biostimulation) refers to oxidation-reduction (redox) reactions facilitated by microorganisms that can degrade, transform, or remove contaminants from soil and groundwater. Biological treatment relies on naturally occurring or supplemental bacteria or fungi to degrade, transform, or remove contaminants. Ideally, metabolic processes of the organisms, at completion, convert contaminants into nontoxic by-products (e.g., carbon dioxide and water). The feasibility of this remediation option is being evaluated and would be implemented to the extent practical depending on the results of the cleanup decision documents. Approximate volumes of soil to be remediated using biological treatment are listed in Table 3-2 and general areas to be cleaned up using biological treatment methods are shown in Figure 3-5.

Biological treatment of soil can be accomplished either in situ (in place) or ex situ (after soil have been removed). When practical, in situ biological treatment has an additional benefit since it does not involve excavation activities and stockpiling of soil. Ex situ biological treatment is typically accomplished through excavating contaminated soil and treating by either land farming (aerating the soil by tilling) or biopiles (aerating by injecting or extracting air through engineered piping).

Biotreatment to accelerate natural degradation of some chemicals may prove useful, however DTSC retains authority and jurisdiction to direct additional actions over any areas where monitored natural attenuation or biotreatment is part of the proposed remedy. DTSC will consider the cleanup actions ability to achieve the cleanup values and timeliness to complete cleanup when evaluating cleanup methods.

Bioventing

TPH in soil may be addressed through an in situ biological treatment method known as bioventing. The feasibility of this remediation option is being evaluated and would be implemented to the extent practical and in compliance with applicable laws, rules, and regulations, depending on the results of the cleanup decision documents. Bioventing involves the injection of air (or other gases for perchlorate) into the subsurface to enhance the biodegradation of TPH and other contaminants. Airflow can be stimulated either by injection or vacuum.

The designs of SVE and bioventing systems are generally similar. SVE aims to volatilize contaminants, extract VOCs, and treat the VOC-laden soil vapor ex situ, while bioventing attempts to maximize the rate of biodegradation in situ by injecting air or other gases into the subsurface. In areas initially subject to SVE treatment for VOCs, the SVE system may be converted to conduct bioventing on the residual TPH after the SVE standards for VOCs were met. Minimal equipment change out would be required.

The operations, maintenance, and monitoring activities for bioventing would be similar to the SVE monitoring activities, with some differences to monitor various performance parameters. Decommissioning of the bioventing system would be as described above for the SVE system.

Gaseous Electron Donor Injection Technology

Gaseous electron donor injection technology could be used for in situ treatment of perchlorate in soil. This technology involves installation of wells for injection of gaseous electron donors into the soil with the purpose of promoting anaerobic biodegradation of perchlorate to water and chloride ion. The feasibility of this remediation option is being evaluated and would be implemented to the extent practical depending on the results of the cleanup decision documents. Equipment needs for this technology include, drill rig, well materials, blower/vacuum, and associated piping.

Ex Situ Biological Treatment

Many chemicals (e.g., perchlorate, TPH, PAHs) in soil may be addressed by ex situ biological treatment techniques using biopiles and/or land farming. This cleanup approach involves the excavation of soil with contaminant concentrations above cleanup requirements and onsite, ex situ remediation. For this methodology, a chemical amendment and water would be added to the soil. The chemical amendment, under a suitably saturated environment, would stimulate anaerobic biodegradation. Ex situ biological treatment for perchlorate was demonstrated during a 2004 Interim Action at SSFL by Boeing. Ex situ biological treatment is generally more cost effective than excavation and offsite disposal, does not result in secondary waste generation, and does not require significant additional infrastructure. The feasibility of this remediation option is being evaluated and would be implemented to the extent practical, depending on the results of the cleanup decision documents.

The excavated soil would be transported by truck to an onsite treatment cell lined with high-density polyethylene (HDPE). The HDPE-lined treatment cell would prevent contact with soil beneath the biopile (that does not contain contaminant concentrations above cleanup requirements) and would collect runoff in a leachate collection system. Chemical amendments and water would be applied to the soil as evenly as possible using agricultural spraying and tilling equipment. HDPE sheets would also be placed over the biopiles to prevent erosion. Sand bags would be used to keep the HDPE sheets in place. In addition to acting as a protection against erosion, the HDPE sheets help the biopile retain moisture and heat levels required for anaerobic microbial activity. Depending on the contaminant reduction observed, enhanced biological treatment may be required. Enhanced biological treatment refers to the addition of microbes or microbial consortia that are suitable to consume the contaminant as a food source.

The monitoring activities for ex situ biological treatment would be designed to gather data to evaluate biological treatment progress. Periodic soil sampling would be performed to estimate contaminant reduction. The soil samples would be collected using hand sampling tools (e.g., trowel, hand auger). Groundwater monitoring of nearby existing wells for tracer contaminants included in the amendments would be conducted, as specified in cleanup decision documents, to verify the amendments have not migrated out of the treatment cells. After remediation is

complete, the HDPE would be removed from the biological treatment piles and the piles would be either recontoured in place or available for other project use as clean backfill, as described in Section 3.6.1.1.

Monitored Natural Attenuation

Monitored Natural Attenuation (MNA)[11] is included for contaminants that degrade or attenuate by natural processes (again, typically TPH, VOCs or SVOCs) without enhanced biological activity. MNA relies on natural physical, chemical, and biological processes to, over time, transform contaminants. This degradation process typically occurs through several intermediate steps that ultimately result in nontoxic end products if complete transformation can be achieved. The time required for the process to complete is an important consideration in determining whether MNA is suitable in a given circumstance. Soil monitoring would be conducted as specified in cleanup decision documents to ensure natural attenuation conditions continue to exist.

3.6.1.4 Phytoremediation

Phytoremediation refers to the use of plants to remediate chemicals of concern. There are multiple types of phytoremediation mechanisms, each of which is applicable to certain contaminant groups or types (Boeing, 2013b):

- Phytoextraction – the uptake and accumulation of contaminants from soil or water into the plant tissue;
- Phytovolatilization - the transfer of the contaminant to air through plant transpiration;
- Rhizosphere degradation – the breakdown of contaminants within the soil surrounding the root (chemical or microbial), where the effective treatment depth depends on the root depth;
- Phytodegradation – the breakdown of certain types of contaminants within plant tissue; and,
- Phytostabilization – the process by which soil and sediment contaminants are rendered relatively immobile by sequestration or other abiotic processes such as adsorption.

Under suitable conditions and at appropriate contaminant levels, phytoremediation is capable of remediating a variety of contaminants including VOCs, TPH, SVOCs (including PAHs), PCBs, and metals. Similar to MNA, phytoremediation is not typically used to reduce contaminant source areas. Phytoremediation is a long term remedial technology, most applicable in areas where the source of contamination is no longer present and most of the contamination has been removed by other treatment mechanisms. Applicability and design of a phytoremediation treatment system requires site-specific assessments to determine contaminant concentration ranges to be targeted and appropriate plant types.

[11] See *A Citizens Guide to Monitored Natural Attenuation* from USEPA's Office of Solid Waste and Emergency Response (USEPA, 2012).for more information regarding use of MNA.

3.6.1.5 Physical Remediation Methods

Soil Washing/Partitioning

Soil washing/partitioning is generally considered a media transfer and volume reduction technology. Soil with contamination above cleanup requirements would be initially mechanically processed, through screens, to separate different sized materials. The smaller-sized materials would then be subject to gravity separation to separate fines from other soil materials. Almost all of the site contaminants would be associated with the fine fraction of the soil, which would require additional treatment or disposal. The feasibility of this remediation option is being evaluated and would be implemented, to the extent practical, depending on the results of the cleanup decision documents.

The process removes chemicals from soil by: (1) dissolving or suspending them in the wash solution (which can be sustained by manipulation of pH for a period of time); or (2) concentrating them into a smaller volume of soil through particle size separation, gravity separation, and attrition scrubbing (similar to techniques established in sand and gravel operations).

The concept of reducing chemical concentrations in soil through the use of particle size separation is based on the fact that most contaminants tend to bind, either chemically or physically, to clay, silt, and organic soil particles. The silt and clay, in turn, are attached to sand and gravel particles by physical processes, primarily compaction and adhesion. The washing processes that separate fine clay and silt particles from coarser sand and gravel also effectively separate and concentrate the contaminants into a smaller volume of soil that can be further treated or disposed of.

The clean, larger fraction of soil can be returned to the site for continued use, either as backfill or other site purposes after confirmation samples confirm cleanup requirements have been met. The percentage of clean, larger-sized soil that can be separated and potentially reused, is based on the nature and concentration of the specific contaminants. For soil partitioning to be practical, the fine fraction should generally be less than 30 to 50 percent; this could result in 50 to 70 percent of the soil potentially being considered clean and eligible for other onsite use.

Complex combinations of chemicals in the soil (such as a mixture of metals, nonvolatile organics, and SVOCs) and heterogeneous chemical compositions throughout the soil mixture make it difficult to formulate a single suitable washing solution that would consistently and reliably remove all of the different types of contaminants. For these cases, sequential washing, using different wash formulations, and/or different soil-to-wash fluid ratios, may be required. The specific washing techniques would be a function of contaminant concentrations and soil type.

Soil Solidification/Stabilization

Soil solidification/stabilization involves mixing soil with solidification/stabilization reagents and can be performed in situ or ex situ. The feasibility of this remediation option is being evaluated and would be implemented, to the extent practical, depending on the results of the cleanup decision documents. Solidification/stabilization reduces the mobility of chemicals in the environment through both physical and chemical means. Different types of

solidification/stabilization reagents can be tested to determine the optimal ratio (based on effectiveness and cost) to reduce mobility of chemicals in soil. Unlike other remedial technologies, solidification/stabilization seeks to trap or immobilize chemicals within their "host" medium (that is, the soil, sand, and/or building materials that contain them) instead of removing them through chemical or physical remediation. Leachability testing is typically performed to measure the potential to dissolve and transport contaminants. Solidification/stabilization techniques can be used alone or combined with other remediation or disposal methods to yield a product or material suitable for offsite disposal, or for onsite beneficial use (Boeing only), because contaminants are physically and/or chemically bound and thus less available to interact with human or ecological receptors.

Solidification/stabilization can be used to treat a broad range of chemicals and may be less intrusive and disruptive to the environment and the community than other remediation or management options. This technology affords a rapid reduction in toxicity and mobility, subgrade strength improvement, and a reduction in permeability. Solidification/stabilization can render contaminants less toxic, less leachable, and more manageable for handling and disposal.

Thermal Desorption

Thermal desorption is a treatment technology for VOCs and other organic compounds such as TPH, SVOCs, PCBs, and dioxins. Thermal desorption refers to the application of heat to volatilize and separate organic contaminants from soil. This treatment technology can be used as an enhancement to SVE and/or in situ biological remediation described above. Volatilized VOCs, if extracted, would be treated prior to discharge. Thermal desorption can also be applied to ex situ soils. The feasibility of this remediation option is being evaluated and would be implemented, to the extent practical, depending on the results of the cleanup decision documents.

3.6.1.6 Capping and Onsite Management

For the Boeing portions of the project area, capping technologies may be applied to soil/sediment areas where contaminants are not amenable to treatment, or in areas where excavation/offsite disposal or other types of treatment for the entire soil volume is not feasible or practical. In these cases, clean soil or an engineered cap composed of soil, gravel, clay, and or various synthetic liners may be placed over the contaminated soil to prevent future exposure (Boeing only). Institutional land-use controls would be required to prevent future digging in these areas, and monitoring plans prepared and approved by DTSC to ensure maintenance and effectiveness of the cap. In addition to capping of contaminated soil, construction of an onsite disposal cell (liner beneath and cap above non-hazardous soils) to receive non-hazardous soils excavated as part of the soil remediation project may be constructed.

Capping and onsite disposal cell construction activities, if implemented, would be conducted using standard earth-moving equipment such as excavators, loaders, scrapers, dozers, and haul trucks and would require detailed geotechnical engineering studies, design surveys, and agency permitting. Capping or onsite management would only be applicable to soils from Boeing administered areas.

3.6.2 Lead Shot and Clay Pigeon Cleanup Activities

Boeing proposes to perform periodic cleanup of lead shot in the vicinity of the Former Rocketdyne Employee Shooting Range pursuant to the 2007 Consent Order. The estimated extent of visible lead shot is shown on Figure 3-5. This area contains relatively steep hillsides with sandstone outcrops in the north, and the relatively flat ground near the Sage Ranch trail adjacent to the northern drainage. The investigation and any future cleanup activities associated with the Former Employee Shooting Range are located north of the northern drainage. Land south of the drainage was impacted by onsite activities, and was cleaned up by Boeing as part of an interim action in 2008.

As described in Section 3.3.5, Boeing has conducted several cleanup actions in the Former Rocketdyne Employee Shooting Range since 1992. Future lead shot and clay pigeon cleanup activities are expected to be similar to those conducted most recently by Boeing in 2011 and 2013. Lead shot and clay pigeon cleanup activities would include coordination with MRCA, conducting biological and cultural surveys, and notification of hiking restrictions within the area prior to field activities. Visible lead shot and clay pigeons would be cleaned up by either manual means (shovels, hand rakes, screens/sifters) or by using backpack-mounted or truck-mounted vacuums. The lead shot and clay pigeons would then be containerized in appropriately labeled 55-gallon drums or other disposal containers (e.g., roll-off bins) and hauled to appropriate disposal or recycling facilities (see Table 3-6). Following cleanup actions, BMPs would be installed for erosion control (straw waddles, silt fencing, etc.).

In some locations, in addition to visible lead shot and clay pigeon debris cleanup activities, soil excavation may also be warranted; although no specific excavation areas have been identified at this time. If soil excavation and restoration activities are required to meet risk-based cleanup goals, they would be performed in a manner similar to those performed onsite (described in Section 3.6.1.1 above), but may be modified to include cleanup of visible lead shot and/or clay pigeons by sieving or sifting for disposal/recycling purposes.

3.6.3 Groundwater and Unweathered Bedrock

The RPs are responsible for cleanup of SSFL impacted groundwater under the 2007 Consent Order. While further investigation to examine the nature and extent is ongoing, the existing data are robust and sufficient to demonstrate that new groundwater plumes are unlikely to be identified. The cleanup requirements for most contaminants have been developed and will be presented in the future groundwater cleanup decision documents and may vary from what is presented in the PEIR. Groundwater cleanup includes consideration of remediation for contaminants in the unsaturated bedrock (vadose zone).

Identified areas of impacted groundwater requiring cleanup are shown in **Figure 3-8**. The primary contaminants to be treated include TCE and its degradation products,[12] 1,2,3-trichloropropane, n-nitrosodimethylamine, perchlorate, and 1,4-dioxane. In some areas, radionuclides (strontium-90 and tritium) have also been identified in groundwater.

The cleanup methods in the following list are being considered for groundwater and/or vadose zone cleanup.

- Groundwater extraction and treatment (pump and treat)
- Thermal enhanced vapor extraction
- In situ chemical oxidation
- In situ enhanced biological treatment
- Air sparging and vapor extraction
- MNA and institutional controls
- Passive treatment at seeps
- Bedrock removal (for strontium-90)
- Bedrock vapor extraction

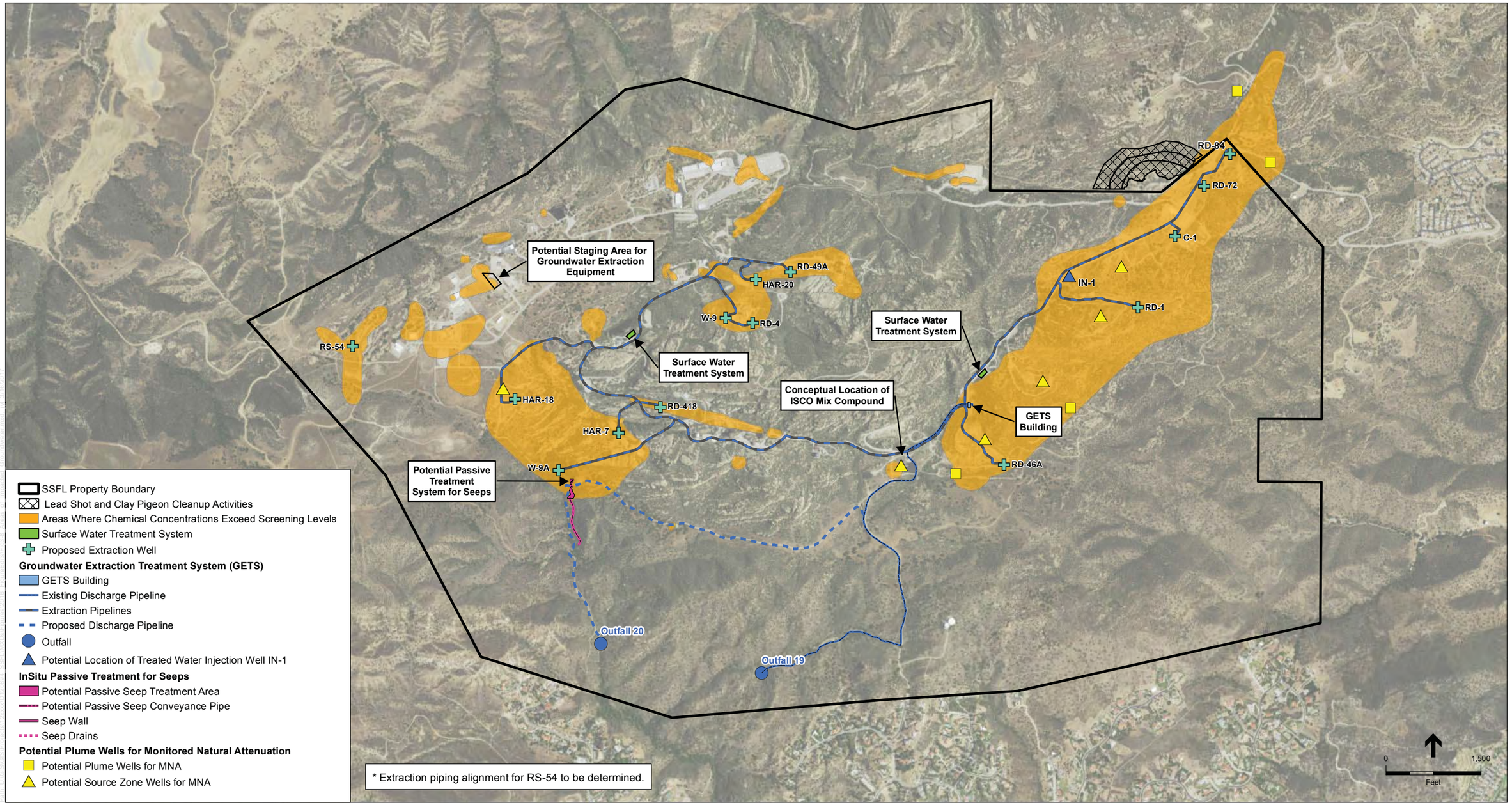
A description of the proposed remediation techniques is presented in the following subsections. For all treatment methods requiring wells, existing wells would be used to the extent possible. When siting new wells, potential environmental impacts and mitigation measures would be considered prior to siting (e.g., cultural and biological resources would be avoided to the extent feasible).

Currently, the anticipated groundwater cleanup project consists of groundwater extraction and treatment, MNA, institutional controls, and passive treatment at seeps. In addition, as described in Section 3.6.4 below, the RPs propose to properly decommission former groundwater extraction wells located within each of their respective areas of responsibility.

3.6.3.1 Groundwater Extraction and Treatment System (Pump and Treat)

In 2009, Boeing installed the infrastructure for a site-wide GETS under the DTSC-approved GWIM that included completion of a Notice of Exception for construction of the treatment system. The GETS facility is permitted by the Ventura County Certified Unified Program Agency and the Ventura County Air Pollution Control District (VCAPCD). The 2013 Notice of Exception assumed the GETS would discharge to Outfall #19 and did not analyze construction of the injection well described later in this section. Figure 3-8 shows the existing extraction wells, pipelines, and treatment system, along with the proposed surface water drainages and the proposed injection well location to be used for the discharge of treated water.

[12] Cis- and trans-1,2-dichloroethene, and vinyl chloride.



SOURCE: MWH 2014; Boeing 2014; ESA 2015

Santa Susana Field Laboratory.120894

Figure 3-8

Areas of Impacted Groundwater

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Extracting groundwater through pumping would be conducted to reduce higher concentrations of contaminants in former source zones and to supplement natural plume containment by manipulating hydraulic control in two areas of SSFL (offsite in the northeast and near WS-9A in the southwest drainage; see Figure 3-8). The GWIM consist of 14 extraction wells located throughout the project site. The GETS treatment plant is located in Area I (see Figure 3-8). Boeing and NASA would operate extraction wells within their areas of responsibility and route the groundwater to the treatment system in Area I. DOE would operate a separate portable treatment system for Area IV (described in the following subsection.

As described earlier in this chapter, the groundwater treatment system and Outfall 19 piping were completed in 2010, ahead of the majority of the wellheads and piping systems. While design and construction at the wellheads and piping systems proceeded, groundwater was extracted and treated from one well (WS-9A) and for a pumping test at the Happy Valley RFI Site. Figure 3-8 shows the existing extraction well locations, pipeline routes, and treatment system location. It also shows the proposed outfall and injection well locations under consideration for the discharge of treated water.

The existing groundwater treatment system consists of filtration, ion exchange, air stripping with vapor-phase carbon treatment, liquid-phase carbon adsorption, and ultraviolet light and peroxide treatment. The treatment system has a maximum design flow rate of 100 gallons per minute (gpm) and a target flow rate of approximately 60 gpm. The treated groundwater would be discharged to one or more of the following locations:

- Surface Water Outfalls 019 and 020 – Treated water could be discharged under a NPDES Permit or other regulatory program. Under the existing NPDES Permit (see Section 3.4.2.9), the treated water would be discharged to surface water drainages through existing (No.019) and proposed (No. 020) NPDES outfalls (see Figure 3-8). Discharges of treated groundwater would be monitored to ensure that the constituents are within effluent limitations that are set by the NPDES permit.
- Injection into the Chatsworth Formation Aquifer – Treated water could be injected into the Chatsworth Aquifer at Injection Well IN-1 or at former water supply well WS-5, shown on Figure 3-8. Injection of treated groundwater would also require permit approval by the LARWQCB, as described above. Construction requirements for an injection well are described in the next page. Prior to approval of injection of treated groundwater onsite, the dischargers would be subject to the LARWQCB waste discharge requirements and permitting processes that would establish discharge limitations.

Although not anticipated, if discharges to Outfalls 019 and 020, or reinjection into the Chatsworth Aquifer, are not viable or sufficient, discharge of treated water from the GETS to the municipal sewer system would be considered. Use of treated groundwater as a dust suppressant or a means of irrigation for revegetation efforts is also under consideration.

Construction activities for groundwater cleanup using GETS would be limited to installation of Outfall 020 and drilling a new injection well or repurposing of an existing groundwater well (Well IN-1), installing wellhead injection equipment, and installing piping to the proposed

discharge locations. Trenching may be required to install conveyance piping below ground from the GETS to the discharge locations.

Equipment required for installation/repurposing of the injection well and associated piping would include a backhoe, water truck, loader, compactor, truck, and support trucks. Installation/repurposing of the injection well(s) would be completed applicable LARWQCB and regulatory requirements. The injection well(s) would be installed into a confined unit of the Chatsworth Formation at a total depth of approximately 1,000 feet below ground surface (bgs). Because the well would be completed in the competent bedrock of the Chatsworth Formation, the open interval from 750 to 1,000 feet bgs would likely be uncased (i.e., not completed with a well screen) or, if warranted, may include a stainless steel well screen.

Following installation, the injection well would be cleaned and developed in general accordance with existing standards. It is expected that five casing volumes would be purged for a total of approximately 10,900 gallons. The purge water would be containerized into three 4,500-gallon HDPE tanks.

Wet and dry drill cuttings (soil and bedrock) removed during borehole installation would be placed into 20-cubic-yard-capacity lined roll-off bins. Approximately 20 CY of drill cuttings would be produced from drilling an injection well. Drill cuttings would be allowed to settle for approximately 24 hours, and any water would be then pumped out of the bin. Drill cuttings would be allowed to air-dry prior to disposal.

All project-derived wastes (drill cuttings, soil from trenching, and purge water) would be transported to an appropriate disposal facility. Alternatively, purge water generated during well development may be transported to the groundwater treatment system for treatment.

The wellhead completion for the injection well would be an aboveground 10-inch-diameter steel well monument enclosure that extends about 3 feet above ground surface. The well monument is intended to protect the wellhead from damage. As needed, standard steel bollards would be set around the pad for ease of location and protection from vehicles. At a well installation location, an approximate 60-square-foot area of vegetation removal would be required. A permanent 3-foot by 3-foot concrete well pad would be installed around the well monument.

The GETS is expected to operate 24 hours a day, except for brief periods of planned maintenance. Routine monitoring of the groundwater treatment system would be conducted monthly, at a minimum, with equipment maintenance conducted quarterly. The GETS is expected to operate for a minimum of 10 years, but could be much longer. Upon completion of the groundwater cleanup, the extraction wells would be decommissioned in accordance with state and local well destruction standards.

DOE Portable System

DOE proposes to operate a separate pump and treat system in Area IV to remediate groundwater within or originating from Area IV with contaminant concentrations above the applicable cleanup requirements in compliance with the 2007 Consent Order. The system would consist of five

existing extraction wells, pumps to extract groundwater, pipelines to route the water to the treatment system, a treatment system to remove the contaminants from groundwater, and a water release system to discharge the treated water to an infiltration system. Based on the DOE's 2015 Former Sodium Disposal Facility Groundwater Interim Measures Implementation Plan, planning, construction and testing of the groundwater treatment system would take approximately 3 years. The design involves extracting (pumping) groundwater from the alluvium and bedrock formations and treating it to remove contaminants above cleanup requirements. The water would be pumped from extraction wells via aboveground piping into a double-walled 4,000-gallon polyethylene tank. Water from the tank would be piped through a series of treatment operations to remove contaminants. The treated water would be pumped to a 20,000-gallon storage tank prior to discharge at a location within Area IV that is to be determined. The treated water storage tank would not require secondary containment since the water inside would have been treated and would meet regulatory standards. The treatment system would be installed and operated under a permit to be issued by the LARWQCB.

The treated groundwater would be pumped through above-ground pipes from the storage tank to an infiltration system that would be installed below the ground surface using a backhoe. The infiltration system would consist of gravel-filled ditches with perforated pipe installed in the gravel for release of the treated water. The treated water infiltration system would be located up gradient impacted groundwater areas so that the infiltrated water would assist in flushing impacted groundwater toward the extraction well(s).

The footprint of the treatment system would be approximately 600 square feet, and the footprint of the treated water storage tank would be approximately 280 square feet. The treatment system components would be preferentially located on areas currently paved or covered by gravel. A portable 10-foot by 10-foot shed would be placed near the treatment system for storage of supplies. A potential staging area for this system is shown on Figure 3-8.

3.6.3.2 Enhanced Groundwater Treatment

Enhanced groundwater treatment involves the injection of one or more fluids into the subsurface using one or more injection wells. Types of enhanced treatment include:

- In situ chemical oxidation facilitates the destruction of the target contaminants by injecting an oxidizing agent, such as ozone, peroxide, or permanganate. The reaction transforms the target contaminants to innocuous chemicals. Depending on the type of oxidant used, TCE, for example, would be broken down into carbon dioxide, water, and dissolved chloride salts.
- In situ enhanced biological treatment facilitates the destruction of the target contaminants by injecting nutrients into the groundwater to stimulate the growth of existing microorganisms capable of transforming target contaminants such as TCE to non-hazardous by-products. No specific locations or facilities have been identified at this time.

In both cases, chemicals or nutrients stored in drums or tanks would be delivered to the subsurface by wells. Wells in the vicinity of the injection locations would be periodically sampled and analyzed for the presence of the injection chemicals and changes in water quality. Additional injection of the chemicals would reoccur periodically until the cleanup standard is met. The

sampling of wells would be more frequent than for the standard monitoring well program, but fewer wells would be sampled. The treatment and monitoring process would be assumed to last on the order of several years.

3.6.3.3 Air Sparging and Vapor Extraction

Remediation of VOCs occurring in shallow groundwater found in the alluvium and fractured weathered bedrock may be treated by air sparging. No specific locations or facilities have been identified at this time. Air sparging involves injecting air either into or beneath the groundwater table (creating bubbles) for the purpose of removing (sparging) VOCs from the groundwater. Air sparging is typically combined with SVE to capture and treat the VOCs sparged from the groundwater and may require modification of the air quality or other permits or approvals for the SVE from local agencies. Air injection wells are placed in a pattern across the treatment area to force airflow through as much of the groundwater as possible. As air bubbles up through the groundwater, the VOCs in groundwater are transferred to the air bubbles. The VOC-laden air bubbles naturally migrate upward through the groundwater to the unsaturated (vadose) zone above the groundwater. SVE is then applied to capture and remove the VOCs.

An SVE capture system is used to extract and treat the VOC-laden vapors from the vadose zone. At the surface, the extracted VOC-laden air is treated using granulated activated carbon (or other air-treatment technologies) prior to releasing the treated air into the atmosphere following applicable laws and regulations. Liquid condensate from the air vapor would be captured prior to granulated activated carbon treatment for offsite disposal.

The air-sparging/SVE system would be automated and monitored by an operations and maintenance technician as specified in remedial planning documents. Air sparging would require a site-specific treatability study to test the technology with the unique geology and contaminant makeup of the site. The results of the study would determine how many air sparging and vapor extraction wells would be required to effectively remediate a given VOC plume, and to confirm the requirements for the extracted vapor treatment system.

3.6.3.4 Monitored Natural Attenuation

MNA relies on natural physical, chemical, and biological processes to, over time, transform and degrade contaminant mass. This degradation process typically occurs through several steps that ultimately result in non-hazardous end products if complete transformation occurs. Samples from monitoring wells track the progress of degradation. The installation of new monitoring wells would be completed based on Ventura County permit requirements. The areas where MNA may be used as a treatment method can be seen in Figure 3-8.

At Area IV, radioactive decay is also a natural attenuation process. In the case of tritium, the half-life decay of 12.3 years is fast enough that it may be appropriate. Data for tritium in groundwater for the past 10 years indicate that tritium is expected to be at concentrations below the maximum contaminant level by 2025. Other radionuclides will also decay over the course of the cleanup; whether this natural decay practically reduces soil removal volumes will depend on the time frames involved and other considerations.

Groundwater monitoring would be conducted using a long-term monitoring plan included in the cleanup decision documents to ensure natural attenuation standards are being met. Upon completion of the groundwater cleanup, the wells would be decommissioned in accordance with state and local well destruction standards. The MNA well decommissioning would be similar to procedures for water supply well decommissioning.

3.6.3.5 Passive Treatment at Seeps

Available groundwater characterization data have identified one area located in the Southern Undeveloped Area where groundwater containing chlorinated ethenes is emerging at the ground surface (i.e., seeps). This area is located onsite south of interim groundwater extraction well WS-9A within the southwestern drainage area and is referred to as FDP-890/-881 (see Figure 3-8). If other contaminated seep locations are identified during completion of the groundwater characterization program, this alternative could be applied at those locations as well.

Passive remediation technologies would be used either to treat impacted groundwater in situ prior to its emergence at the surface or to collect groundwater immediately below the ground surface with gravity conveyance for passive remediation through granulated activated carbon. In situ remediation of contaminated seeps could also be achieved through installation of a permeable reactive barrier using zero-valent iron (elemental metallic iron). As the contaminated water flows through, the iron transforms certain chemical compounds (e.g., TCE) into non-hazardous compounds (carbon dioxide and chloride in the case of TCE).

Alternatively, the affected groundwater could be collected at the seeps and passed through granulated activated carbon to adsorb contaminants as the water flows through. Installation of a permeable reactive barrier to address contaminated seeps at FDP-890/-881 would require the following construction activities in this area.

- Access road modification
- Clearing and grubbing
- Soil and rock excavation (depending on the nature of this activity, a streambed alteration agreement may be needed.)
- Soil/rock stockpiling and transfer to haul trucks
- Import of the zero-valent iron or granulated activated carbon, coarse-grained materials, and concrete
- Placement of materials
- Recontouring
- Installation of BMPs to minimize erosion
- Seeding and planting

Construction equipment would include backhoes, excavators with hydraulic breakers, haul trucks, vacuum trucks, compactors, water trucks, concrete trucks, and light-duty trucks. Limited blasting of the bedrock may also be required. Removed vegetation would be disposed offsite by truck to

appropriately licensed landfill facilities, as described in Section 3.6.1.1. Soil/rock-containing contaminant concentrations above cleanup requirements would be placed in USDOT-approved containers for disposal, as described in previous sections of this document.

Remediation effectiveness monitoring would be conducted by collecting and analyzing samples from either existing or new seep cluster wells, similar to what already exists within the drainage. The system would be removed after achieving cleanup requirements.

3.6.3.6 Bedrock Removal for Strontium-90

Bedrock in the vicinity of the former leach field at the RMHF contains strontium-90 and is acting as continuing source of this radionuclide to groundwater. The RMHF is shown in **Figure 3-10** (later in this section). The groundwater is regularly recontaminated when the groundwater level rises into a zone of contaminated bedrock. When the water level falls, the strontium-90 concentrations in groundwater decrease. It is assumed that the zone of strontium-90 contamination extends from 10 feet into bedrock (10 feet below the bedrock surface) to 35 feet into bedrock based on the presence of strontium-90 in groundwater when the groundwater elevation reaches 45 feet bgs.

The bedrock is covered with about 10 feet of backfill soil, placed from a prior leach field interim removal action, which would be excavated and stockpiled. The footprint of the bedrock excavation would be approximately 20 feet by 40 feet (800 square feet), but the soil excavation footprint would be larger (approximately 40 feet by 100 feet) in order to build a ramp for the excavator to get down to the top of the bedrock and provide room to maneuver around the rock excavation.

The bedrock source would be removed using a hydraulic breaker attached to an excavator. The hydraulic breaker would be capable of breaking the rock into removable pieces, and the excavator would be used to dig out the broken rock and place it into a sealed box to be transported to an approved offsite disposal facility. The depth of the bedrock excavation would be about 35 feet bgs. The source removal activity would occur after the RMHF is removed (second year of building removal) and would last for a period of approximately 20 working days and require five workers.

The total volume of rock that would be removed would be about 1,050 CY. The volume of rock to be hauled offsite would be larger (approximately 1,700 CY), because broken rock is not as compact as rock in the ground. An excavator and operator, and support vehicle and helper, would be onsite each day of excavation. The hydraulic breaker would be used with an accompanying dust suppression system that sprays a mist of water on the breaker bit and rock surface to knock down dust generated when the rock is broken. Additional water would be sprayed on the rock during loading to decrease the dust. A water truck and operator would be onsite during the excavation activities.

A staging area would be set up near the excavation to store equipment and supplies. The staging area would be located immediately adjacent to the south of the excavation or along the access

road to the west. The excavated soil would be stockpiled in this area as well. The staging area would have a truck wash to remove dust and dirt from vehicles leaving the area. The wash water would be collected, sampled for radiation, and sent offsite for disposal if necessary. The spent wash water would be stored in a tank prior to disposal.

While rock removal is taking place, the air would be monitored for dust and radiation. An environmental specialist and a radiation technician would be onsite every day to set up and calibrate monitors.

Following excavation, the excavated bedrock would be backfilled with clean soil, and the previously removed and stockpiled cover soil would be replaced. The removed bedrock would be transported to the appropriate waste facility, as described in Table 3-6.

3.6.3.7 Bedrock Vapor Extraction

NASA has tested vapor extraction to remove VOCs from bedrock in the vicinity of the Bravo Skim Pond (see **Figure 3-9**).

Bedrock vapor extraction would be similar to SVE described previously, although the extraction wells and ancillary monitoring instruments would be drilled deeper into the unsaturated bedrock and screen depths would target factures and specific geologically transmissive strata.

3.6.4 Decommissioning of Monitoring Wells and Former Water Supply Wells

Monitoring wells and former water supply wells within the project site would be decommissioned in place by grouting with a bentonite cement grout. Decommissioning of water supply wells would not affect current or future water supply at the project site because these wells are not used to supply water. As noted above, monitoring wells would be decommissioned as they reach their useful life span and are replaced with new monitoring wells or after groundwater cleanup and monitoring goals are met.

Several former water supply wells are still present at the site since they are part of the groundwater monitoring program or, in some cases, are used as extraction wells. Decommissioning of former water supply wells would occur where well locations are known and once there is no longer an anticipated use for monitoring or groundwater remediation. To date, this includes five wells in Area I, five in Area II, two in Area III, and one in Area IV, as shown in Figure 3-2. Use of a few former water supply wells for injection of treated groundwater is also being considered.

The exact locations of four former water supply wells are uncertain (WS-1, WS-2, WS-4, and WS-10). If identified during cleanup activities, these wells would be decommissioned. The equipment required to decommission the water supply wells would include a drill rig, excavator, loader, haul truck, roller compactor, and support trucks. The wells would be destroyed by overdrilling the wells with a larger-diameter auger and then pressure grouting the borehole from the bottom of the well to the surface until the target pressure is achieved.

3.6.5 Schedule, Workforce, and Equipment

Table 3-7 presents the activities, duration, and construction equipment needs for each of the methodologies described previously in this chapter. It is assumed that various activities addressed in the PEIR, including building removal and soil excavation and disposal activities, would begin within approximately 30 days of DTSC's decision on the Final PEIR, and all of the activities would be completed in 10 to 15 years by a workforce of as many as 250 employees.

Natural attenuation monitoring activities may occur over a longer period of time (to be determined based on confirmation sampling). Any one or a combination of cleanup technologies presented above could be used to achieve the project's remedial objectives. Site cleanup activities would be initiated after certification of this PEIR and DTSC approval of the initial cleanup decision documents prepared by the RPs. It is anticipated that approval of the initial cleanup decision documents would occur after certification of this PEIR.[13]

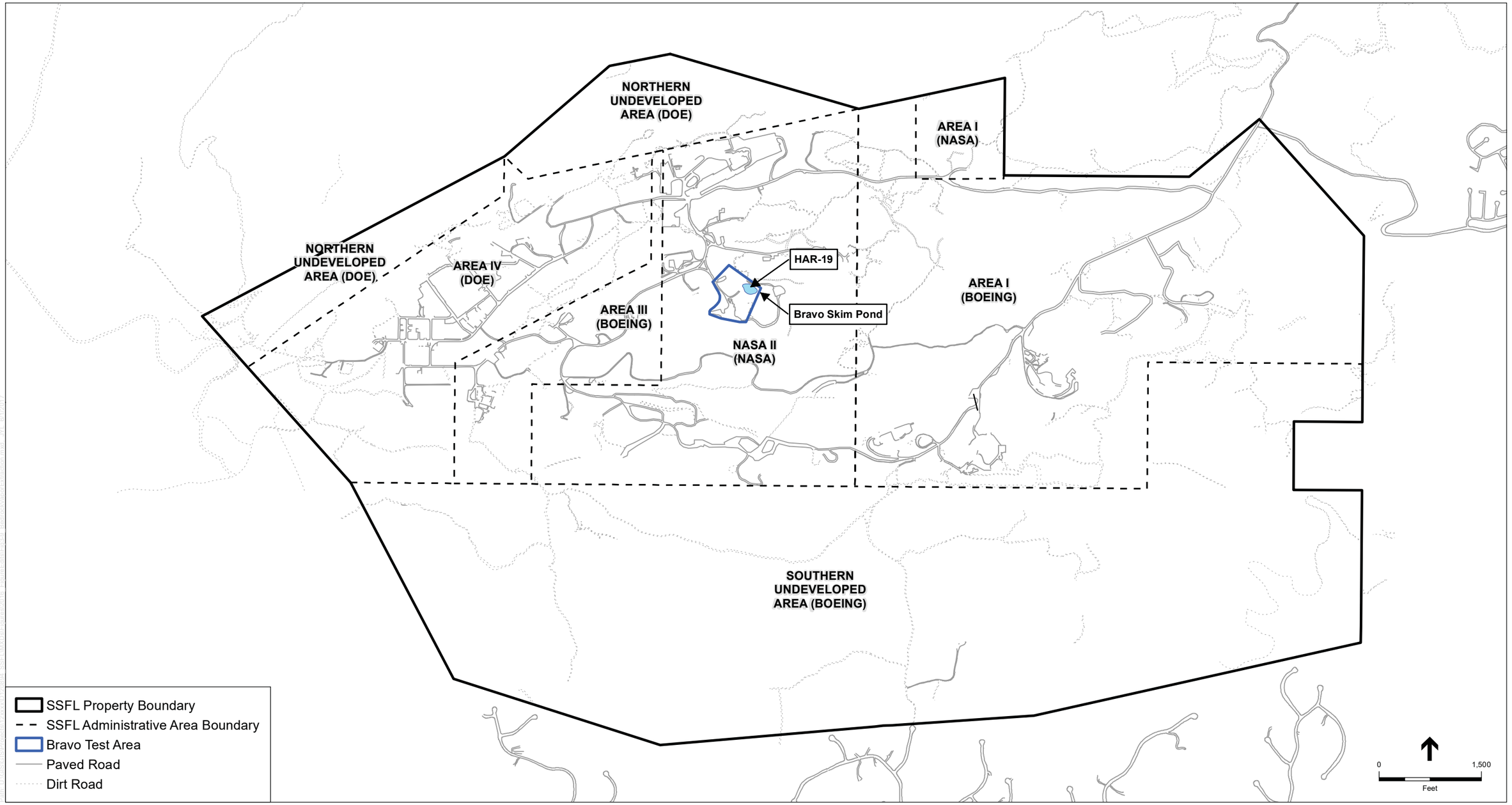
Groundwater cleanup has been initiated through operation of the GETS. However, final/comprehensive groundwater cleanup would be initiated after DTSC approval of the groundwater cleanup decision documents. MNA is being considered as a final phase of the cleanup, which would require ongoing monitoring, as specified in cleanup decision documents.

Most site work activities would occur 5 days per week (Monday through Friday), approximately 11 hours per day approximately from (7:00 a.m. to 6:00 p.m.). Longer work days during the summer and work on Saturdays may occur.

As with what is proposed for excavation activities, the daily maximum number of trucks visiting the site for export and import of materials would be 96 round trips (resulting in 192 total trips) in total for all RPs combined. This maximum would represent all types of truck trips, including equipment deliveries, excavation spoils, building demolition debris, and delivery of backfill soil. For planning purposes, it is assumed that actual truck traffic would range between 48 truck trips (round trips) and that the maximum of 96 round trips. The overall project schedule would range between 10 to 15 years. This predicted variability is based on factors such as scheduling, the complexity of various projects stages (i.e., building removal, excavation, backfilling, confirmation sampling etc.), coordination between RPs, determination of final soil excavation volumes, and project initiation and ability to ramp up overall production given the nature of the SSFL project as a whole.

As many as 250 employees are expected to be onsite routinely during soil removal activities.

[13] This PEIR has been prepared to evaluate the potential environmental effects of the proposed project and other strategies and methodologies that may be considered by DTSC in the cleanup decision documents. As discussed in Section 2.1.2, *Future Review of Project-Level Designs*, of this PEIR, DTSC shall review and determine if the impacts associated with such cleanup decision documents have been adequately considered in this PEIR.



SOURCE: MWH 2013; ESA 2016

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Figure 3-9

Bedrock Vapor Extraction Test Location

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TABLE 3-7
CONSTRUCTION DETAILS FOR OVERALL SITE CLEANUP

Project	Activities	Duration	Construction Equipment
Soil			
Excavation and Disposal	Vegetation removal, grubbing, road improvements, excavation, stockpiling, truck loading/transport, backfilling, restoration	10 to 15 years	Dozers, loaders, excavators, scrapers, on-highway haul trucks, vacuum trucks, compactors, a mobile centrifuge dewatering unit, water trucks, street sweepers, light-duty and support trucks
Soil Vapor Extraction	Install 150 extraction wells (10–35 feet deep), and associated piping/treatment system, monitoring, well removal, restoration	3 to 6 years	Drill rigs, excavators, loaders, scrapers, trenchers, compactors, pavers, street sweepers, cement trucks, blower/vacuum, piping, light-duty and support trucks
Bio Treatment - Bioventing	Well installation/removal, monitoring, restoration	3 years	Well materials, drill rig, blower/vacuum, piping, light-duty and support trucks
Bio Treatment - Gaseous Electron Donor Injection	Similar to SVE and bioventing	3 years	Well materials, drill rig, blower/vacuum, piping, light-duty and support trucks
Bio Treatment - Ex Situ Biological Treatment	Clearing, grubbing, excavation, stockpiling, add water and chemical amendment, monitoring restoration	3 years	Dozers, loaders, excavators, scrapers, vacuum trucks, compactors, mobile centrifuge dewatering unit, water trucks, street sweepers, light-duty and support trucks
MNA (soil)	Soil monitoring	TBD [A]	Drill rig, light-duty and support trucks
Physical Remediation - Soil Solidification / Stabilization	Drill holes with augers to inject and mix reagent or excavate and process soil ex situ	TBD [A]	Excavators, loaders, pug mill, light-duty and support trucks
Physical Remediation - Thermal Desorption	Insert conductive wiring into media and apply electricity	TBD [A]	excavators, drill rigs, electric generators, light-duty and support trucks
Capping and Onsite Management	Place non-hazardous contaminated soils from Boeing Areas I and III (only)	TBD [A]	Excavators, loaders, scrapers, dozers, haul trucks, light-duty and support trucks
Lead Shot and Clay Pigeon Cleanup Activities			
Cleanup of Lead Shot and Clay Pigeons	Physically clean up lead shot and clay pigeon debris	5 years	Shovels, hand rakes, screens/sifters, or backpack-mounted or truck-mounted vacuums; may include some localized excavation
Groundwater			
Groundwater Extraction & Treatment System	Install Outfall 020, drill or repurpose existing well for treated water injection, install wellhead treatment equipment, trenching and installation of piping	Minimum of 10 years	Drill rig, water truck, loader, excavator, loader compactor, haul truck, light-duty and support trucks
Enhanced Groundwater Treatment	Injection of chemicals or nutrients into groundwater, monitoring	Monitor for several years	Drill rigs, support trucks, light-duty and support trucks
Air Sparging and Vapor Extraction	Site-specific treatability study, install vapor extraction wells, monitoring	1 to 5 years	Drill rig, blower/vacuum, piping, well materials, backhoe, light-duty and support trucks
MNA (Groundwater)	Monitoring	Ongoing [A]	Drill rigs, support trucks, light-duty, and support trucks

Project	Activities	Duration	Construction Equipment
Passive Treatment at Seeps	Access road modification, clearing and grubbing, soil and rock excavation, soil/rock stockpiling , transfer to haul trucks, placement of materials, recontouring, seeding and planting	Ongoing	Backhoes, excavators with hydraulic breakers, haul trucks, vacuum trucks, compactors, water trucks, concrete trucks, light-duty and support trucks
Bedrock Removal for Strontium-90	Excavate bedrock, break bedrock, haul away and dispose of bedrock	6 to 12 months	Excavator, support vehicle, hydraulic breaker, dust suppression system, water truck, light-duty and support trucks
Bedrock Vapor Extraction	Install extraction wells, monitoring, well removal, restoration	1 to 5 years	Well materials, drill rig, blower/vacuum, piping, light-duty and support trucks
Decommissioning of Water Supply Wells	Overdrill wells, grout wells	6 months to 1 year	Drill rig, excavator, loader, haul truck, roller compactor, light-duty and support trucks

TBD = To be determined
A = Time frames for these durations noted as TBD will be carefully considered and limited as appropriate.

3.7 Initial Activities

As discussed in Section 3.6, the environmental analysis describes and evaluates the estimated soil remediation volumes and areas of impacted groundwater, as well as the cleanup strategies and methodologies being considered to clean up the affected media in a manner that would be consistent with the 2007 Consent Order and the 2010 AOCs.

This section presents descriptions of the currently anticipated initial activities for this project. These activities currently have a sufficient level of detail for an in-depth analysis. These activities are more readily implementable following certification of this PEIR, public notice and comment on draft cleanup decision documents, and DTSC approval of such documents. The activities described in this section include projects with sufficient detail for evaluation at a project level (as compared to the program-level activities described in Section 3.6). It is important to note that these activities represent a portion of the cleanup activities described in Section 3.6 and that RPs will develop additional projects in future cleanup decision documents (as described in Section 2.1, *Purpose of the PEIR*, and Section 2.4.4, *Approval Process for Future Documents*, of this PEIR) for public notice and comment, and then approval by DTSC.

The RPs would implement the activities described in this section as soon as possible after approval by DTSC and completion of any other regulatory permitting processes, including by the County of Ventura, LARWQCB, CDFW, etc. DTSC will also consult with California Department of Public Health Services, Radiologic Health Branch (CDPH), regarding characterization and disposal of material that is potentially impacted by radionuclides. The initial activities described in the following pages would not increase the maximum number of trucks (96 round trips) or workers (250) accessing the site each day. **Figure 3-10** shows an overview of all the proposed initial projects. As described previously, estimates presented in this PEIR reflect a greatest degree of impact scenario, as the requirements of the cleanup decision documents would reflect refinements in the project design that would result in reductions or no changes to the overall scale of the project.

DOE's initial project (Section 3.7.1) prioritizes the cleanup of radionuclide impacted soil (with contiguous chemicals) that exceed "AOC background" values. NASA's initial project (Section 3.7.2) addresses the soil cleanup work in administrative Area I (former Liquid Oxygen Plant).

Boeing has stated its intent to address its cleanup by working on the worst contaminated portions of its project first. Although Boeing has not yet prepared a description of specific initial activities for inclusion in this PEIR, Boeing anticipates that one or more cleanup decision documents, representing cleanup in a portion or all of its areas, would be prepared and submitted to DTSC for impact evaluation based on the information presented in this PEIR.

Activities related to the two post-closure units and closure of three former hazardous waste management facilities, all of which are currently non-operational, under the RCRA Hazardous Waste Facility Permitting Program are described in Section 3.7.4.

3.7.1 DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal

DOE's proposed initial activity is to remove approximately 3,000 CY of soil within Area IV that contains radionuclides above LUT values, and approximately 88,000 CY of radionuclide and chemical contaminated soil. Because the radiologically and more highly chemically contaminated soil is not amenable to onsite remediation, excavation with offsite disposal is the proposed remediation method. Therefore, this project would result in removal of approximately 91,000 CY of soil with radionuclides above their respective LUT values in Area IV, as shown in **Figure 3-11** and in **Tables 3-8** and **3-9**.

As required by the AOC, DOE soils with radionuclides above final "AOC background" values would be excavated for offsite disposal. Provisional soil LUT values have been published by DTSC. Soil sampling work performed by USEPA identified two key radionuclides of concern, Cesium-137 (Cs-137) and Strontium-90 (Sr-90), and the locations within Area IV where these two site-related radionuclides exist. DOE soils with radionuclides above the final "AOC background" values, with or without co-located chemical contamination, would be transported to a permitted radioactive materials disposal facility, such as the Nevada National Security Site

(NNSS) facility in Nevada and/or Energy Solutions facility in Utah. The volume estimates for the DOE initial project are presented in **Table 3-8** and **Table 3-9**.

Further details regarding DOE's initial project will be provided in a draft cleanup decision document, in accordance with the respective 2010 AOC.

TABLE 3-8
DOE'S INITIAL PROJECT – SOIL VOLUME ESTIMATES

Soil Contamination Type	Volume (CY)
Radiological impact only	3,000
Radionuclide and chemical	88,000
Chemical only	209,000
Total	300,000

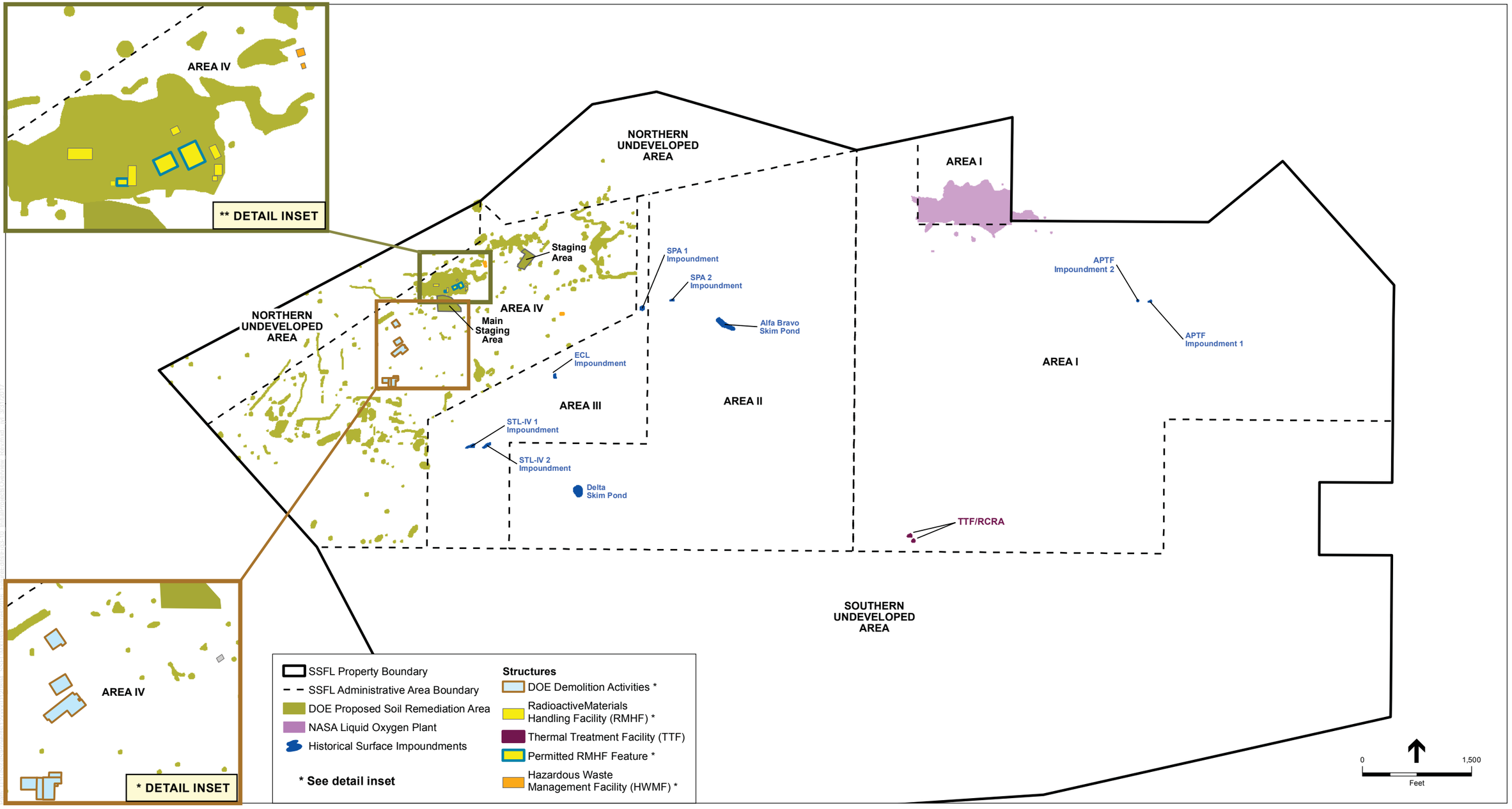
NOTES:
The volumes are in situ calculations that exceed the LUT values, and do not incorporate an expansion factor.

Source: CDM, 2015a.

TABLE 3-9
SUMMARY OF DOE INITIAL ACTIVITY

DOE Initial Soil Cleanup Project Area Type	No. of Locations	Estimated Area (acres)	Estimated In Situ Volume (CY)	Estimated Weight (tons) [A]	Estimated Truckloads for Disposal [B]	Estimated Off-Haul Duration (months) [C]	Estimated Volume of Offsite Backfill (CY) [D]	Potential Disposal Facilities
Radionuclides above Soil LUT	5	>1	3,000	4,500	200	0.6	2,250	NNSS, Energy Solutions Utah
Radionuclides above Soil LUT – no hazardous chemicals	45	7	44,000	66,000	2,870	8.5	33,000	NNSS, Energy Solutions Utah
Radionuclides above Soil LUT – with hazardous chemicals	14	12.4	44,000	66,000	2,870	8.5	33,000	NNSS, Energy Solutions Utah
Radionuclides below Soil LUT – no hazardous chemicals	241	25.4	160,000	240,000	10,440	31	120,000	US Ecology Idaho, Buttonwillow, Westmoreland
Radionuclides below Soil LUT – hazardous chemicals only	27	5.2	49,000	73,500	3,200	9.5	36,800	US Ecology Idaho, Buttonwillow, Westmoreland
Totals	**332**	**50**	**300,000**	**450,000**	**19,580**	**58**	**225,000**	

Note: All soil volumes in this table are rounded to three significant digits and refer to CY for in situ soils.
A. Estimated weight (tons) is calculated by using a conversion factor of 1.5 tons per cubic yard of in situ soils. Capacity of off-haul trucks assumed to be 23 tons on average. Factors are based on experience at SSFL during interim source removal action as described in Boeing (2014).
B. Estimated truckload values are rounded to the nearest 10.
C. The estimated off-haul duration of 58 months for this initial activity assumes DOE would average 16 off-haul trucks per day. This assumption is based on an equal distribution of the low-end predicted schedule of 48 to 96 round truck trips per day for all RPs combined. Off-haul duration assumes 21 work days per month. The total estimated number of trucks including all disposal and backfill for all RPs combined is presented in Table 3-15.
D. Estimated backfill volume needed to supplement recontouring with surrounding soil is assumed to be 75 percent of the total estimated remediation area in situ volume soil. A greater percentage of backfill volume is proposed due to the nature of DOE remediation areas that are often deeper than those of the other RPs, and thus require additional soil for stabilization.
Offsite backfill sources include P.W. Gillibrand Company, Santa Paula Materials, Inc., Grimes Rock, and Tapo Rock and Sand Products. Onsite soil borrow areas may be utilized for backfill if approved and available. Backfill hauling is assumed to be performed by dedicated haul trucks (i.e., separate trucks than those removing soil).



SOURCE: NASA 2016; ESA 2015

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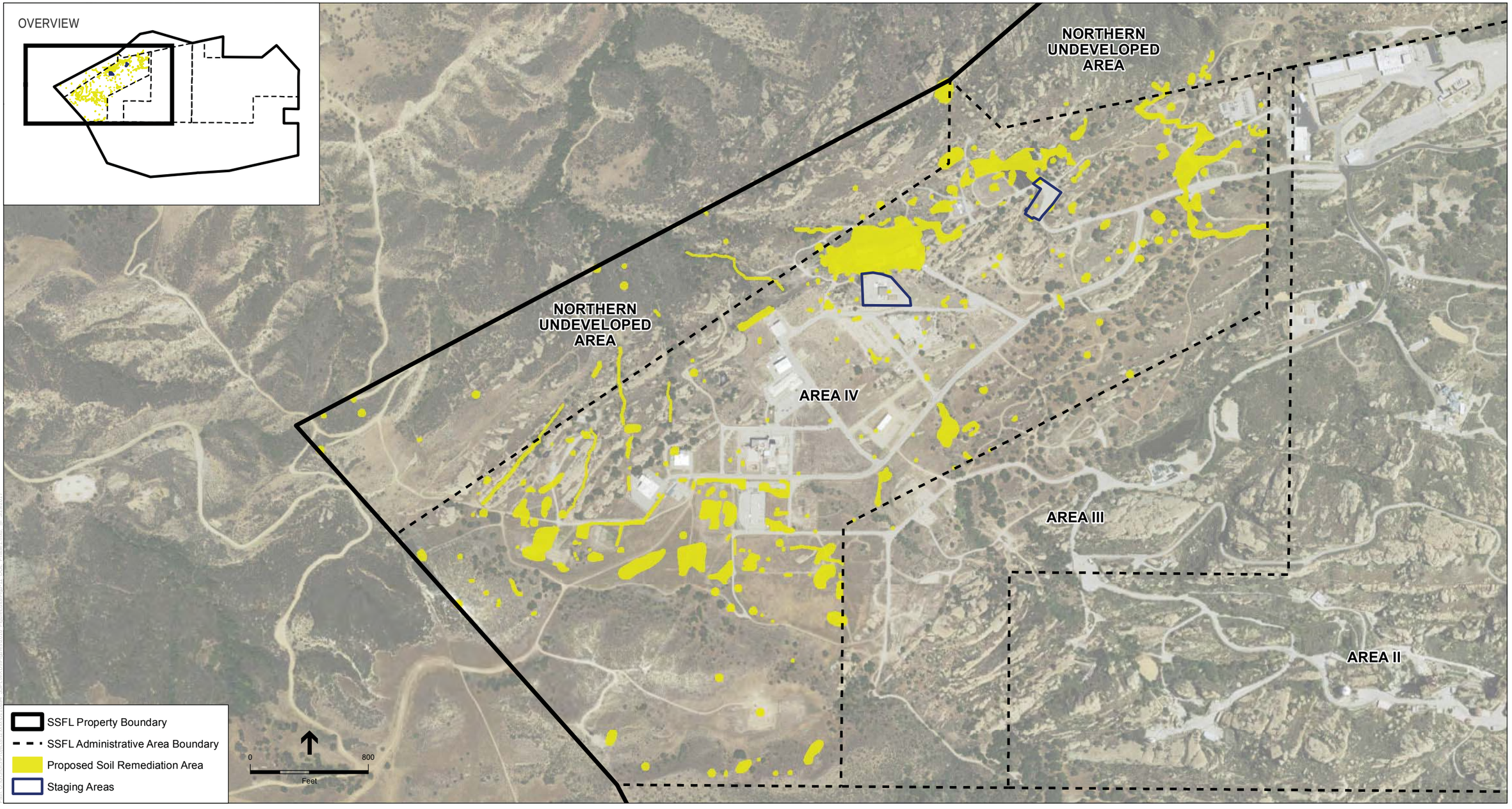
Figure 3-10

Overview of Initial Activities



SOURCE: Boeing 2015; DOE 2015

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Figure 3-11

DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal

3.7.1.1 Disposal Facilities

Potential disposal facilities are presented in Table 3-6. The NNSS facility in Nevada and Energy Solutions facility in Utah have been identified as potential disposal facilities for soils with radionuclides that cannot be accepted by a RCRA-permitted hazardous waste disposal facility. Soil with chemical-only contamination (radionuclides at background or below) would be transported to either a RCRA Class I hazardous waste disposal facility or a Class 2 or Subtitle D compliant Class 3 non-hazardous disposal facility based on characterization results. The final location of the specific facilities would be identified at the time that a DOE contractor is contracted to conduct the removal action. Final selection of facilities to accept the soil would be evaluated as part of the cleanup decision documents. DTSC will consult with CDPH when evaluating final disposition and disposal facility selection for all waste from SSFL. DOE and DTSC are in the process of evaluating all soil data collected from Area IV to determine the final extent potential soil remediation actions.

3.7.1.2 Backfilling/Restoration

In accordance with cleanup requirements, after confirmation sampling is completed, excavation areas would be restored with approved backfill soil, followed by regrading and reseeding of the replacement soil. The sources of backfill soil needed to replace excavated soil have not been confirmed. DTSC is working to ensure that DOE and NASA conduct a thorough survey of potential sources of backfill that meets the requirements.

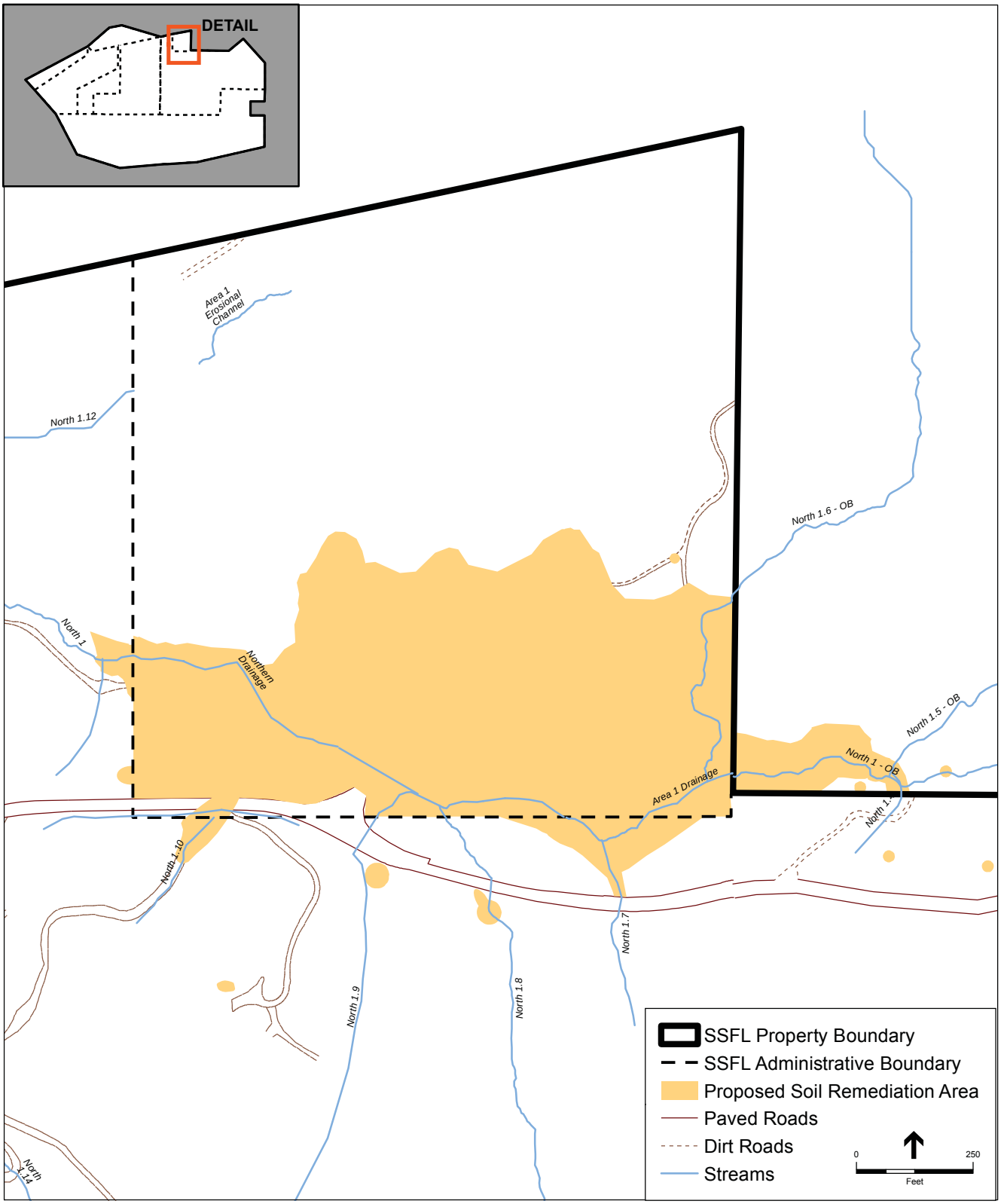
3.7.2 NASA Liquid Oxygen Plant

NASA's initial activity addresses chemically impacted soils at the former Liquid Oxygen Plant. The Liquid Oxygen Plant area is the 41.7-acre area located in the northern part of Area I (**Figure 3-12**). This area is owned by the federal government and administered by NASA.

3.7.2.1 Excavation and Disposal

In most of the areas identified for this initial activity, multiple contaminants are present in soils (TPH, PAHs, dioxins, VOCs, SVOCs, PCBs, and metals) that require remediation. Figure 3-12 presents the maximum extents of the proposed initial activity. NASA's cleanup decision documents will further define this initial project. The area being evaluated in this PEIR as NASA's initial activity is approximately 16 acres and includes a conservatively estimated volume of 73,500 in situ CY of soils. **Table 3-10** and Figure 3-12 present the assumptions used to estimate this volume.

It is important to note that a portion of this soil volume may be a candidate for treatment by MNA, or other in situ treatment methods, which would result in a reduction of the volume of soil to be excavated and disposed of offsite. It is estimated that up to 17,100 in situ CY of this soil could be remediated in place via MNA, leaving 56,400 in situ CY for excavation and offsite disposal. Final determination of treatment options would be made after NASA completes its ongoing soil treatability studies. However, to ensure that potential impacts are not understated, this PEIR analyzes the potential impacts related to excavation and offsite disposal of the full 73,500 CY of impacted soil at the Liquid Oxygen Plant site.



SOURCE: NASA, 6/23/2016

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Figure 3-12

NASA Liquid Oxygen Plant

TABLE 3-10
NASA INITIAL ACTIVITIES SOIL REMEDIATION AREA SUMMARY

NASA Initial Soil Volumes [A]	Estimated Area (acres)	Estimated In Situ Volume (CY)	Estimated Weight (tons) [B]	Estimated Truckloads for Disposal [C]	Estimated Off-Haul Duration (months) [D]	Estimated Volume of Offsite Backfill (CY) [E]	Potential Disposal Facilities
Hazardous Soil	12.8	58,800	89,400	3,890	12	19,600	La Paz County Landfill, US Ecology Beatty
Non-Hazardous	3.2	14,700	22,400	970	3	4,900	Chiquita Canyon Landfill, Azusa Land Reclamation, US Ecology Beatty, La Paz County Landfill, DeMenno Kerdoon, Simi Valley Landfill and Recycling Center
Total Soil Volumes	**16**	**73,500**	**112,000**	**4,860**	**15**	**24,500**	NA

Note: All soil volumes in this table are rounded to three significant digits and refer CY for in situ soils.

A. Estimated volumes of potentially hazardous soil are based on previous interim source removal action volumes. Waste characterization sampling would be performed prior to disposal. Criteria for characterizing hazardous soil would be based on published state and federal hazardous waste laws.
B. Estimated weight (tons) is calculated by using a conversion factor of 1.5 tons per cubic yard of in situ soils. Capacity of off-haul trucks assumed to be 23 tons on average.
C. Estimated truckload values are rounded to the nearest 10.
D. The estimated off-haul duration of 15 months for this initial activity assumes NASA would average 16 off-haul trucks per day. This assumption is based on an equal distribution of the low-end predicted schedule of 48 to 96 round truck trips per day for all RPs. Off-haul duration assumes 21 work days per month. Trucks hauling backfill and periodic increases in off-haul volume would be in addition to this number (but would not exceed 96 trucks per day) and are to be expected based on day to day project requirements. The total estimated number of trucks including all RPs, disposal and backfill is presented in Table 3-15.
E. Estimated backfill volume needed to supplement recontouring with surrounding soil assumed to be one-third of the total estimated remediation area soil in situ volume. Offsite backfill sources include P.W. Gillibrand Company, Santa Paula Materials, Inc., Grimes Rock, and Tapo Rock and Sand Products. Onsite soil borrow areas may be utilized for backfill if approved and available. Backfill hauling is assumed to be performed by dedicated haul trucks (i.e. separate trucks than those removing soil).

As discussed previously, at least 56,400 in situ CY of Liquid Oxygen Plant site soils are not amenable to onsite treatment due to the nature of the contaminants present. Thus, excavation with offsite disposal using standard soil excavation and transport equipment is the proposed remediation method. The soil would be transported in covered transport containers (roll-off bins, dump trucks) to an approved waste facility. The specific disposal facilities that would be used for this effort would be identified during the final planning stages of the cleanup.

Prior to excavation, NASA would conduct site preparation activities, including vegetation clearance, staking, equipment staging, and surveying for potential subgrade utilities or other buried infrastructure within the excavation areas. In addition, NASA would obtain applicable regulatory permits prior to beginning field work.

3.7.2.2 Backfilling/Restoration

NASA would backfill excavations using imported clean fill to approximately mimic natural contours. The majority of the excavated area is anticipated to be generally shallow (less than 5 feet bgs). Thus, it is assumed that approximately one-third of the total excavated volume would be replaced by backfill. After backfill is complete, the area would be graded and contoured to conform with the natural drainage and seeded using an approved native seed mixture.

3.7.3 Demolition Activities

The RPs would remove the majority of the remaining buildings and infrastructure from the site at the early stages of the cleanup. These buildings and infrastructure are not part of the RCRA hazardous waste facilities described in Section 3.7.4. The removal programs for these buildings and associated infrastructure are separate from the environmental cleanup and closure activities that DTSC regulates at SSFL. As described in Section 3.3.4, the authority for non-DTSC-permitted building removal falls under the general building and permitting authority of Ventura County. DTSC does not have discretionary authority relating to the demolition and disposal of these non-DTSC-permitted buildings and infrastructure.

As described in Section 3.3.4, DTSC is electing to include an enhanced discussion of the removal of the remaining DOE-owned buildings and infrastructure within Area IV as part of this PEIR. The following discussion is being provided because of the location of, and anticipated timing for, the Area IV building removal and in recognition of the multiple RPs operating under separate and independent cleanup orders, schedules, and legal constraints. It in no way establishes or implies that DTSC has discretionary authority in the demolition process, impacts Ventura County's general building and permitting authority[14] with regard to Boeing-owned buildings within Area IV, nor undermines DOE's discretionary authority regarding its building removal program under NEPA.

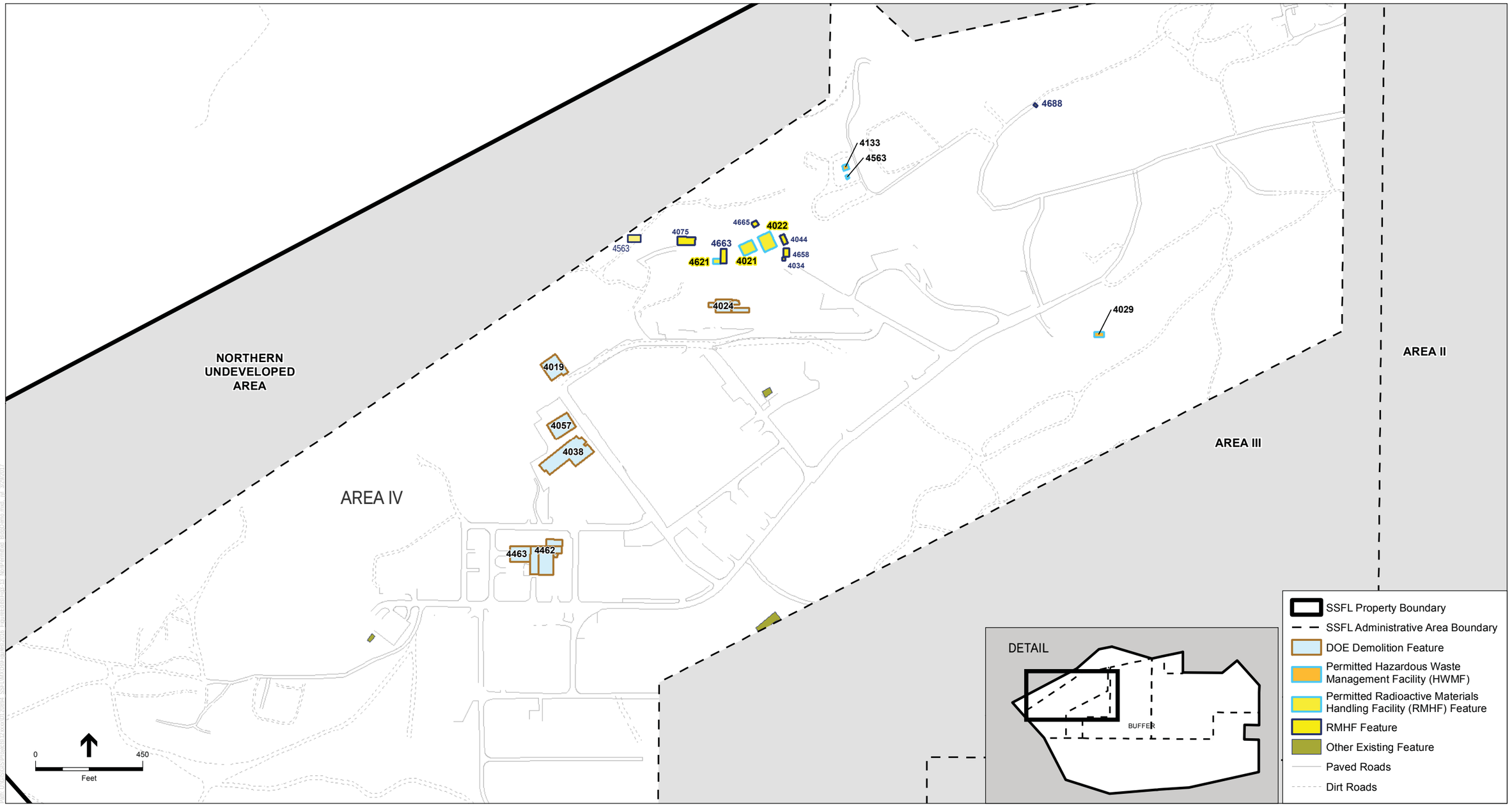
Finally, the extent of DTSC's authority over the demolition of Boeing-owned buildings in Area IV of SSFL is the subject of a lawsuit pending in Superior Court of California, County of Sacramento (Case No: 34-2013-8001589). DTSC's election to discuss the existing DOE- and Boeing-owned buildings and infrastructure within Area IV in this section shall in no way be construed as an admission or acknowledgement that DTSC has discretionary authority over buildings and infrastructure which, as in this case, are not associated with hazardous waste activities. Impacts related to demolition of Boeing's five inactive buildings in Area IV are included in the cumulative analysis of this PEIR.

3.7.3.1 DOE Building Demolition Activities

DOE plans to remove the following 19 Area IV features (see **Figure 3-13**):

- Seven sheds used for material storage
- Six larger buildings including:
  - Sodium Pump Test Facility (B4462, B4463)
  - Energy Technology and Engineering Center office (B4038)
  - Sodium Test/Warehouse (B4057)
  - Former reactor buildings (B4019, B4024)

[14] Ventura County maintains general building and permitting authority for building demolition.



SOURCE: Boeing 2016; DOE 2015

Santa Susana Field Laboratory.120894

Figure 3-13
Demolition Activities

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- One building slab (B4663)
- Two RCRA-permitted features within the HWMF
- Three RMHF interim status facility buildings.

Removal of the two RCRA-permitted buildings (HWMF [B4029, B4133], and three RMHF interim status facility buildings [B4021, B4022, B4621]) is a discretionary decision under DTSC authority (see Section 3.7.4), and discussed separately in Sections 3.7.4.2 and 3.7.4.3.

This demolition work would be conducted under DOE's decommissioning and demolition process that requires a building demolition plan under DOE's authority. The building demolition plans would be developed in accordance with a standard operating procedure developed to address the steps leading up to, implementing, and closing out such demolition. As part of decommissioning, surveys of building materials, through records searches and/or direct field screening and/or analytical testing, would be conducted for the presence of radionuclides and hazardous contaminants or hazardous materials (e.g., asbestos, lead based paint, mercury).

Building materials from features that were not previously authorized[15] to handle radiological material and are outside of the RMHF compound (Buildings 4038, 4057, 4462, 4463), particularly metal structural debris screened and certified to be clear of potential radiological impacts, chemical contamination, or hazardous materials (e.g., asbestos, lead based paint) would be managed consistent with the AOC and recycled to the extent possible. Building debris from features formerly authorized to handle radiological material (4019) that have been released for unrestricted use in accordance with DOE's internal policy outlined in Order 458.1[16] would be disposed of in accordance with all applicable regulations, including the Governor's Moratorium (Executive Order D-62-02 [2002 [17])]) that requires material from decommissioned facilities to be disposed of in a Class I hazardous waste facility.

All material/debris from within the RMHF[18] and from Building 4024, as well as any material exhibiting radioactivity above screening methods presented in DOE Order 458.1 would be transported to the NNSS in Nevada, or an alternate low-level radioactive waste disposal facility, for disposal as low-level radioactive waste.[19]

15 "Authorized" refers to DOE's internal authorization, under the Atomic Energy Act, to handle radioactive material. Facilities that were not authorized to handle radioactive material are those facilities within Area IV that have never handled radioactive materials, thus the associated building materials are classified for waste disposal based on material characteristics and are applicable to standard federal and state hazardous waste control laws and regulations. Nevertheless, debris from such features within Area IV would be screened for radionuclides before being disposed of at any facility other than a low- level radioactive waste facility.

16 DOE's Order 458.1 outlines requirements to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under the control of DOE pursuant to the Atomic Energy Act of 1954, as amended, and is the basis for clearance of real and personal property that must be met in order to release a given facility for unrestricted use.

17 Material from licensed facilities within Area IV that are decommissioned could be subject to the Executive Order D-62-02 (aka Governor's Moratorium) as presented on September 30, 2002, and signed by Governor Grey Davis of California, concerning statewide disposal of decommissioned material into landfills in the state of California.

18 Buildings 4021, 4022, 4044, 4075, and 4621 were listed as locations authorized to handle radiological material within the RMHF complex with the authorized users based out of Building 4034. Because use authorization applications list the location of the principle user, most use authorizations identified for the RMHF complex

Debris from formerly authorized facility features that has been released for unrestricted use would be disposed of at Class I hazardous waste facilities.

Other hazardous materials remain within the facilities such as lead-based paint, mercury switches, and asbestos-containing materials. A hazardous materials assessment would be performed as part of the pre-demolition activities to determine proper abatement techniques as well as transportation and disposal requirements.

Description of Individual DOE Features Proposed for Removal

Tables 3-11 and **3-12** summarize associated volumes and proposed waste dispositions.

Building 4019. Building 4019 was used for criticality acceptance tests on Systems for Nuclear Auxiliary Power reactors before they were delivered for launch. Building 4019 was not historically authorized to handle radioactive materials; total-encapsulated highly enriched uranium was handled in Building 4019, however due to its encapsulation, such activities do not meet the definition of "handled" that would require "authorization" (USEPA, 2012). In 1965, following the final Systems for Nuclear Auxiliary Power testing, all encapsulated nuclear materials were removed and the building assigned to non-nuclear use. Building 4019 has also undergone decommissioning and verification surveys and has been released for unrestricted use based on screening considerations (USEPA, 2012).

Hazardous materials expected to be encountered include asbestos, lead paint, PCB light ballasts, and mercury switches. Such hazardous materials would be abated, transported, and disposed of in accordance with local, state, and federal laws and regulations to a Class I hazardous waste facility.

Removal of the subsurface vaults would result in a 40-foot deep excavation that would be backfilled or otherwise stabilized after the vaults are removed. Details of the stabilization would be described in the building demolition work plan.

Building 4024. Building 4024 was historically authorized to handle radioactive materials (USEPA, 2012). Testing of reactors was part of the Systems for Nuclear Auxiliary Power program. Operations of reactors resulted in radiological contamination of the below-grade concrete walls. Test reactors and related components were removed during previous decontamination and decommissioning work. The remaining activities for B4024 would be to remove the remaining feature and subgrade concrete.

indicate the principle user was located at the RMHF Office Building 4034, though historical use of Building 4034 does not indicate handling of radioactive material.
Note that Buildings 4021, 4022, and 4621 are RCRA- permitted facilities. These facilities are mentioned in this section for documentation completeness only; the demolition activities associated with these permitted facilities are presented in Section 3.7.4.2.

19 Classification based on historical building use and does not necessarily indicate waste characteristics.

TABLE 3-11
ESTIMATES OF DOE BUILDING DEBRIS VOLUMES DESTINED FOR LOW-LEVEL RADIOACTIVE WASTE FACILITIES [A]

Building	LLRW (CY) Volume	LLRW (CY) Debris Type	Released Material (CY)		Hazardous Waste (CY)	ACM (CY)	Clean Debris (CY) Volume	Clean Debris (CY) Debris Type	Truck Trips [C]
4024	755	concrete	3,050	concrete/debris	29.7	12.7	-	-	274
	125	metal	229	asphalt, lead, other					
RMHF Buildings B									
4034	-	-	-	-	1.4	0.6	95	steel	8
							19	concrete/debris	
4044	-	-	-	-	1.7	0.7	118	steel	10
							23.7	concrete/debris	
4075	-	-	-	-	4.6	2	40.5	steel	7
							57.7	concrete/debris	
4563	-	-	-	-			27.9	steel	2.0
							2	concrete/debris	
4665	-	-	-	-	1	0.4	5.9	steel	1
							9	concrete/debris	
4658	-	-	-	-	0.2	0.1	1	steel	1
							1.9	concrete/ debris	
4688	-	-	-	-	-	-	6.11	steel	2
							16.2	concrete/debris	
4663 (slab)	-	-	-	-	-	-	19.6	concrete/debris	2
Other RMHF Area Debris	28	-	-	-	-	-	80	concrete	7
Asphalt							717	asphalt	47
Total [A]	**125**	**metal**	**3,047**	**concrete/debris**	**38.6**	**16.5**	**294**	**steel**	**361**
	783	**concrete/ debris**	**229**	**asphalt**			**229**	**concrete/debris**	
							717	**asphalt**	

A. DOE has elected to dispose of all material from RMHF features (permitted or not) as well as Building 4024 to a low-level radioactive-waste facility, such as NNSS, regardless of waste characteristics or waste classification presented in this table, because of the history of these particular facilities. Presumed waste characteristics presented in this table are for reference only.
B. Only RCRA RMHF features are included in this table. Information regarding RCRA-permitted features (Buildings 4021, 4022, 4621, Mixed-waste storage yard) debris disposal is presented in Section 3.7.4.2.
C. Assume 1.5 tons per CY of debris, average, regardless of material and assume 23 tons payload per truck trip.

ACM – asbestos-containing material.
CY – cubic yards.
LLRW — low-level radioactive waste.
Source: CDM, 2015b.

TABLE 3-12
ESTIMATES OF DOE BUILDING DEBRIS VOLUMES NOT DESTINED FOR LOW-LEVEL RADIOACTIVE WASTE FACILITIES

Building	Clean Debris (Class III) (CY)	Decommissioned Material (Class I) (CY)		Hazardous Waste (CY)		ACM (CY)	Recycle (CY)		Truck Trips [A]
4019		1,130	debris	30		6			76
4038	141	-	-	32	-	14	100	steel	41
							200	asphalt	
							140	concrete	
4057	79	-	-	15	-	7	880	steel	70
							100	concrete	
4462 / 4463	1,000	-	-	36	lead, etc.	15	1,610	steel	205
							501	other	
Total	**1,220**	**1,130**	**debris**	**113**	**lead, etc.**	**42**	**2,590**	**steel**	**392**
							200	**asphalt**	
							240	**concrete**	
							500	**other**	

A. Assume 1.5 tons per CY of debris, average, regardless of material, and assume a 23-ton payload per truckload.
ACM – asbestos-containing material.
CY - cubic yards.
Sums may not exactly reflect the individual entries due to rounding.

Given its radiological history, all material would be disposed of at NNSS or another facility permitted to receive radiological materials.

Removal of the subsurface vaults would result in a 40-foot deep excavation that would be backfilled or otherwise stabilized after the vaults are removed. Details of the stabilization would be described in the building demolition work plan.

Building 4038. Building 4038 was formerly used as an office building. There is no history of radioactive material use in Building 4038 and it was not historically authorized to handle radioactive material (USEPA, 2012). It is anticipated that most of the building material (metal and concrete) from Building 4038 would be recycled. Clean debris from Building 4038 that is not recyclable would be disposed of as clean debris at a Class III landfill.

Hazardous material that is expected to be abated from Building 4038 is limited to asbestos, lead paint, and mercury switches. Such hazardous materials would be abated, transported, and disposed of in accordance with local, state, and federal laws and regulations.

Building 4057. Building 4057 formerly housed two sodium test rigs and was used as a sodium pump test laboratory until 1998. Since that time, it has been used as a DOE records repository and a for field equipment storage. There is no history of radioactive material use in the building and it was not historically authorized to handle radioactive materials (USEPA, 2012).

Hazardous material that is expected to be abated from Building 4057 is limited to asbestos, lead paint, PCBs in light ballasts, and mercury switches. Such hazardous materials would be abated, transported, and disposed of in accordance with local, state, and federal laws and regulations.

Sodium Pump Test Facility (B4462 and 4463). The Sodium Pump Test Facility was one of seven facilities in Area IV used for testing of liquid metals. Buildings 4462 and 4463 were not historically authorized to handle radioactive material (USEPA, 2012).

Hazardous material that is expected to be abated from Building 4057 is limited to asbestos, lead paint, PCBs in light ballasts, and mercury switches. Such hazardous materials would be abated, transported, and disposed of in accordance with local, state, and federal laws and regulations.

RMHF. Building 4034; sheds 4044, 4075, 4563, 4658, 4665, 4688; the slab for former Building 4663; and surrounding asphalt and debris are not RCRA permitted features. Sheds 4044 and 4075 were listed as authorized use locations with the authorized users based out of Building 4034.

Regardless, of the historical use of specific features within the RMHF, given the proximity to areas that did treat or handle radiological or mixed waste, all material from these[20] RMHF features would be disposed of at NNSS, or an alternate facility permitted to receive radiological materials.

[20] Debris from RCRA-permitted RMHF features would also be disposed of at NNSS or another facility permitted to accept low-level radiological waste, as described in Section 3.7.4.2.

The grounds surrounding all the features within the RMHF fence line are covered with asphalt. An asphalt berm controls and directs all surface water to a catch basin and water storage tank located at the western edge of the facility. Potential future use or disposition of the catch basin and water storage tank would be determined during demolition planning.

Demolition Schedule

Demolition and removal of buildings is anticipated to take approximately 3 to 5 years to complete given truck traffic limitations, scheduling, and logistical requirements. DOE would establish two staging areas to support building demolition work. The main staging area would be within the central portion of Area IV and would share duties with staging requirements for soil remediation. It would include the contractor trailer, worker parking, portable restrooms, construction/ excavation vehicle parking, and decontamination pad. The main staging area would be situated on flat ground where buildings existed to take advantage of existing cement foundations. It would not require grading or significant vegetation clearance. A secondary staging area would be set up in the eastern portion of Area IV near the Sodium Reactor Experiment site. It would include contractor trailers, worker parking, portable restrooms, construction/excavation vehicle parking, and a decontamination pad. This staging area would occupy the site of former Building 4003, which is currently an open, weedy, flat strip of land.

Demolition and Equipment Staging

The buildings would be demolished using standard construction equipment and demolition techniques. The proposed construction equipment includes water trucks, sweepers, cranes, backhoes and/or excavators with impact chisels and grapplers, front-end loaders, forklifts, concrete saws, various handheld power tools, high dump truck and semi-trailers with roll-off bins. A work crew of approximately 26 employees would be required to operate heavy equipment and manage the demolition work. Building demolition plans would present detailed equipment and personnel requirements.

Debris or materials with elevated radionuclide readings would be placed in DOT-approved containers (e.g., boxes or similar). Debris piles with the potential to create dust and full transport bins would be covered to prevent airborne release.

Truck wheels and undercarriages would be washed prior to exiting Area IV in a fully contained wheel-wash area. Wheel-wash wastewater found to contain radioactive material would be disposed of at an appropriate waste facility (see list in Table 3-6). DOE would have authority over the final disposition of any radioactive waste.

The existing stormwater control and NPDES monitoring system would remain in place during demolition. These control systems capture approximately 99 percent of the runoff (assuming a 1-year storm event of 2.5 inches in 24 hours) from Area IV.

Disposal Facilities

Potential disposal facilities are presented in Table 3-6. The NNSS facility in Nevada has been identified as the preferred disposal facility for low-level radioactive waste debris. The Energy Solutions facility in Utah may be used if necessary and would be retained as a backup option. The

specific disposal facilities would be identified at the time of demolition. Selection criteria of facilities to accept the debris would be evaluated as part of the building-specific demolition work plan development. Approval of the disposal facilities for radioactive and mixed waste would be under authority of DOE and per the specific facility accepting the waste.

DOE anticipates that hazardous waste would be disposed of at the Clean Harbors, Buttonwillow facility or the US Ecology, Grand View, Idaho facilities. DOE may direct some hazardous waste to the Clean Harbors, Westmoreland Class I facility, if necessary.

DOE is considering several facilities for non-hazardous waste including (with the most likely facility listed first) two CA Class III sites (Chiquita Canyon and Antelope Valley), and two CA Class I sites (Buttonwillow, Westmorland).

Three facilities are being considered for receipt of non-hazardous recyclable material, including Kramer Metals, Standard Industries, and Gillibrand.

Backfilling/Restoration and Other Building Considerations

Restoration of the building areas is expected to be delayed until DOE completes characterization of the soil beneath the various buildings in accordance with the AOC. Characterization of all building footprints would be conducted following removal of slabs and subgrade features through soil sampling. Soil above "AOC background" values would be addressed in accordance with soil removal description presented in Section 3.7.1. Remediation of soil would be a DTSC-discretionary activity and thus the impacts would be assessed separately from the building demolition presented in this section.

In the interim, DOE would place the building areas in a safe and stable configuration to facilitate investigation under the AOC. The details related to the safe and stable configuration would be presented in the building specific demolition work plan.

Currently, water, sewer, and gas service to all Area IV buildings has been severed. The buildings are connected to electrical service which would be deactivated prior to building removal. Buried utilities would be severed at the building footprint during building demolition. Roadways would remain in place following building demolition to provide access to stormwater control systems monitoring wells, and to facilitate other site activities.

3.7.3.2 Boeing Building Demolition

As discussed in Section 3.3.4, demolition of Boeing's five inactive buildings in Area IV is not subject to DTSC approval, and is therefore not evaluated or described in this PEIR as part of the proposed project. However, impacts stemming from this action are included in the cumulative analysis of this PEIR.

3.7.3.3 NASA Test Stands and Buildings

Given that NASA issued its Record of Decision in April 2014 to proceed with demolition and that such demolition is ongoing, it is therefore not evaluated or described in this PEIR as part of the proposed project. However, impacts stemming from this action are included in the cumulative analysis of this PEIR, as discussed in Section 3.4.2. NASA's March 2014 SSFL Final EIS, includes a full analysis and detailed description of the planned NASA demolition program for SSFL Area II.

3.7.4 RCRA Post-Closure and Hazardous Waste Facility Closure

DTSC would evaluate the renewal of two post-closure permits and regulate the closure of three former hazardous waste management facilities, all of which are currently non-operational, under the RCRA Hazardous Waste Facility Permitting Program. The soil cleanup requirements for closure of the RCRA-permitted facilities on NASA- and DOE-administered areas would be dictated by the 2010 AOCs and the soil cleanup requirements for closure of the RCRA-permitted facilities on Boeing-administered areas would be dictated by the 2007 Consent Order. Cleanup of site-wide groundwater contaminated by RCRA-permitted facilities is dictated by the 2007 Consent Order.

A brief overview of terms used in the RCRA program is provided to help orient the reader in this section of the document. Much of the RCRA terminology is similar, but different, from that in the remainder of this PEIR.

- "Closure" is approximately analogous to "cleanup" as described elsewhere in this PEIR.
- "Closure Plan" is approximately analogous to the cleanup decision documents described above, and would be prepared to communicate the anticipated activities in detail before they are implemented.
- "Post-Closure" is approximately analogous to the operations, monitoring, and maintenance that may be required after cleanup actions are completed to ensure and confirm that the chosen remedy continues to protect human health and the environment.

Closure plans and post-closure plans were approved when DTSC issued a RCRA Hazardous Waste Facility Permit or approved Interim Status for each facility. Revision or renewal of these documents constitutes a change in the permit conditions, which triggers a permit modification. Thus, the action(s) are evaluated under CEQA within this PEIR. The specific anticipated activities for each RCRA-permitted unit are described below.

3.7.4.1 Thermal Treatment Facility Closure

This project is located in Area I and would be implemented by Boeing. The TTF is an Interim Status Facility, meaning that the facility was granted Interim Status while DTSC evaluated the permit application. Before the permit was finalized, operations at the TTF were discontinued and closure under the RCRA program began; thus a permit was never issued. The TTF is shown in Figure 3-10. The TTF consisted of a Concrete Pad and Burn Pit 2.

Closure would include excavation and disposal of the soils and debris that were contaminated by TTF operations, followed by confirmation sampling and restoration. Anticipated soil excavation areas from the TTF are included in Figure 3-10. The soil excavation estimate is 300 in situ CY. It is anticipated that Boeing would conduct closure of the TTF at about the same time as with cleanup at the remainder of the Area I Burn Pit. The details of the closure would be described in a TTF Closure Plan, which would be submitted to DTSC and subsequently made available for public review and comment before the closure plan is approved for implementation.

The TTF closure goal is for clean closure for soil by demonstrating that hazardous material has been removed or that concentrations of hazardous material that remain are at levels that are protective of public health and the environment. Proposed closure activities include excavation of impacted materials, confirmation sampling, and backfill. Risk-based cleanup goals would be established in the TTF Closure Plan following the Standardized Risk Assessment Methodology (MWH, 2014). If vadose zone bedrock and/or groundwater are determined to be impacted based on releases from the TTF, Boeing proposes to evaluate cleanup options for the vadose zone bedrock and groundwater under the 2007 Consent Order.

Prior to excavation, remediation areas would be surveyed for potential subgrade utilities or other buried infrastructure and regulatory permits would be obtained. A Grading Permit, if required, would be obtained from Ventura County. Since the work is not planned in drainages, permits from the CDFW, United States Army Corps of Engineers (USACE), and/or the LARWQCB are not anticipated.

During closure implementation, approximately 300 CY of in situ soils would be excavated using excavators, front-end loaders, vacuum trucks, and/or backhoes. It is estimated that this work would require one construction crew (approximately five people) to complete the project in about a one-month period. Waste characterization sampling of soils excavated as part of this project would be conducted prior to disposal activities. Excavated soil determined to meet hazardous waste criteria, and that does not contain radionuclides (with the exception of NORM or TENORM) may be disposed of at the following locations: Clean Harbors, Buttonwillow, California; Chemical Waste Management, Kettleman Hills, California; US Ecology, Grandview, Idaho; or Clean Harbors, Deer Trail, Colorado. Soil determined to be non-hazardous may be sent to Antelope Valley or McKittrick Landfills for disposal.

Confirmation samples would be collected at each soil remediation area from the bottom and sides of the excavation (estimated to be approximately 2.5 to 5 feet bgs and at depths of 0.5, 5, and 10 feet below the bottom excavation depth).

Once sampling results indicate the residual soils meet the final, approved soils cleanup levels, restoration activities would begin. Excavated areas would be restored so that the overall drainage pattern in the area is similar to the pre-excavation condition by backfilling and recontouring with soils in the surrounding area and/or supplemental backfill. It is anticipated that the volume of supplemental backfill that would be required would be approximately 100 CY, estimated as approximately one-third of the total excavated soil in situ volume. This supplemental backfill is assumed to be from offsite sources or from clean backfill soils from onsite, if approved and

available. Following backfilling activities, the areas would be reseeded using an approved native seed mixture.

Boeing would provide additional construction information regarding TTF Closure project activities in the draft TTF Closure Plan, including the description of excavation equipment, soils management and waste disposal protocols, biological and cultural constraints, confirmation sampling approach, backfilling and restoration procedures, transportation plan, and closure certification.

3.7.4.2 Radioactive Materials Handling Facility Closure

This project is located in Area IV and closure would be implemented by DOE. The RMHF is an Interim Status Facility, meaning that the facility was granted Interim Status to operate while DTSC evaluated the permit application. It was previously used as a radiological and mixed-waste treatment and storage facility. The entire RMHF occupies 1.5 acres of land and includes 11 buildings and features and paved areas, as shown in Figure 3-13. Only specific features (Buildings 4021, 4022, and 4621 and Mixed-Waste Storage Yard) within the RMHF are authorized by DTSC as a RCRA Interim Status Facility; the remaining buildings are for support of the RMHF operations, but were not used to directly handle or treat hazardous or mixed waste for disposal purposes. Because DTSC has authority over closure of the RMHF, DTSC's approval of the closure would be a discretionary action that requires analysis in this PEIR.

As part of the overall cleanup activities in Area IV, closure of Buildings 4021, 4022, and 4621 and the associated Mixed-Waste Storage Yard would be one of DOE's initial projects. All building materials from the RMHF would be disposed of at a permitted radioactive materials disposal facility.

Closure activities for these buildings would be limited to decontamination and demolition of the physical features (building debris consisting of concrete, steel, other building materials and appurtenances). Characterization of all building debris would be conducted to identify and document proper handling and disposal.

DOE would conduct pre-decontamination sampling and surveying of building materials, followed by decontamination and post-decontamination confirmation sampling of building materials. Pre- and post-demolition decontamination sampling would be conducted to: (1) allow for safe handling of the demolition debris, (2) determine and document proper handling of wastes, and (3) prevent release of radiological or chemical contamination during transfer to the appropriate offsite disposal facilities. DTSC would coordinate with California Department of Public Health and USEPA regarding air sampling.

The building debris estimates for closure of the RMHF Interim Status Facility would be further defined in the associated closure plan. Estimates of building debris are provided in **Table 3-13**.

TABLE 3-13
RMHF CLOSURE BUILDING DEBRIS ESTIMATES

Building	LLRW (CY/tons)	MLLRW (CY/tons)	Hazardous Waste (CY/tons)	ACM (CY)	Clean Debris (CY/tons) [A]	Truckloads [B,C]
4021	890/1,330	9/14	15/23			60
4022	1,400/2,110	9/13	14/21	4	1,300/1,950 (steel) 50/80 (concrete/debris)	185
4621	-	-	1/2	1	12/20 (steel) 12/20 (concrete/debris)	2
Mixed-Waste Storage Yard (Asphalt)	80/120	-	-	-		6
Totals	***2,370/3,560***	***18/27***	***30/46***	***5***	***1,312/1,970 (steel)*** ***62/100 (concrete/debris)***	**253**

Notes:
A. "Clean debris" designation is based on building debris characteristics and historical sample results. All material form RMHF would be disposed of at a LLRW or MLLRW facility.
B. Assume approximately 23-ton payload per truck trip.
C. Assume approximately 1.5 tons per cubic yard debris.

ACM – Asbestos-containing material.
CY – cubic yards.
LLRM – low-level radioactive waste.
MLLRW – mixed low-level radioactive waste.
Sums may not exactly reflect the individual entries due to rounding
Source: CDM, 2015b.

Building debris derived from the RMHF closure is proposed for disposal at one of the permitted radioactive materials disposal facilities listed in Table 3-6. The RMHF Closure Plan would describe specific decontamination and demolition methods to be employed during the decontamination and demolition.

Demolition and Equipment Staging

The buildings would be demolished using standard construction equipment and demolition techniques (DOE, 2016). The proposed construction equipment includes water trucks, sweepers, cranes, backhoes and/or excavators with impact chisels and grapplers, front-end loaders, forklifts, concrete saws, various handheld power tools, high dump truck and semi-trailers with roll-off bins.

Two staging areas would be used for the work (as shown on Figure 3-11). The first would be shared with other DOE cleanup activities being conducted and would be located in the central portion of Area IV. It would include the contractor trailer, worker parking, portable restrooms, construction/excavation vehicle parking, and decontamination pad. The other staging area, the RMHF debris staging area, would be in the immediate vicinity of the RMHF, located within an existing paved area and would not require grading or significant vegetation clearance.

Truck wheels and undercarriages would be washed prior to exiting Area IV in a fully contained wheel-wash area. Wheel-wash wastewater containing radioactive material would be disposed of at an appropriate waste facility listed in Table 3-6. DOE would have authority over the final disposition of radioactive waste.

Building debris would be staged on intact concrete and/or on top of a plastic liner for onsite sorting and characterization for disposal. Soil or materials with elevated radionuclide readings would be placed in DOT-approved containers (e.g., boxes or similar). Debris piles with the potential to create dust and filled transport bins would be covered to prevent airborne releases.

The existing stormwater control and NPDES monitoring system would remain in place during demolition. These control systems capture approximately 99 percent of the runoff (assuming a 1-year storm event of 2.5 inches in 24 hours) from Area IV.

Disposal Facilities

Potential disposal facilities are presented in Table 3-6. The NNSS facility in Nevada has been identified as the preferred disposal facilities for RMHF debris. The Energy Solutions facility in Utah may be used if necessary and would be retained as a backup option. The specific disposal facilities would be identified at the time of the demolition. Selection criteria of facilities to accept the debris would be evaluated as part of the RMHF Closure Plan development. Approval of the disposal facilities for radioactive and mixed waste would be under authority of DOE.

Backfilling/Restoration

Restoration of the RMHF area is expected to be delayed until DOE completes characterization of the soil beneath the various RMHF buildings. Investigation, remediation and final restoration would be conducted under DTSC's authority as described in the AOC. In the interim, DOE would place the former RMHF building areas in a safe and stable configuration to facilitate investigation under the AOC. The details related to the safe and stable configuration would be presented in the Final RMHF Closure Plan.

3.7.4.3 Hazardous Waste Management Facility Closure

This project is located in Area IV and would be implemented by DOE. The HWMF includes Buildings 4029 and 4133 and is located in Area IV (see Figure 3-13). The HWMF began operation in 1978 and was fully-permitted by DTSC as a RCRA hazardous waste treatment and storage facility in 1983 for non-radiological chemical waste generated onsite. In February 2006, DTSC issued a Class 2 modification to the permit that approved implementation of the December 2003 HWMF Closure Plan. Soon after, DOE began pre-demolition work, consisting of pre-demolition sampling and assessment activities. However, before physical decontamination and demolition began, DTSC issued a letter (May 23, 2007, and clarification letter dated June 4, 2007) that directed DOE to suspend all activities associated with the closure and/or decontamination and demolition of the HWMF until the EIS that DOE is preparing under NEPA for its cleanup action is completed (DTSC, 2007b, 2007c). In response to DTSC's letter, DOE placed the HWMF in a safe and stable configuration and has been conducting environmental monitoring while working on finalizing the EIS.

Closure activities are expected to resume after this PEIR and DOE's EIS are completed and a revised HWMF Closure Plan is approved by DTSC.

As part of the overall cleanup activities in Area IV, closure of the HWMF would be one of DOE's initial projects. Closure activities for these buildings would be limited to decontamination

and demolition of the physical features (building debris consisting of concrete, steel, other building materials and appurtenances). All building materials from the HWMF would be resized for transport and disposal to an appropriate permitted disposal facility based on waste characterization. Building 4029 and 4133 have been cleared for unrestricted use and thus disposal of waste at a permitted radioactive materials disposal facility would not be required.

It is estimated that decontamination and demolition of Buildings 4029 and 4133 would result in approximately 15 truckloads of waste as presented in the table below. Characterization of all building debris would be conducted to identify and document proper handling and disposal in accordance with applicable state and federal laws. Remediation of soil beneath and surrounding the buildings would be conducted in a subsequent and separate phase under authority of the AOC that is not included as part of this individual project. The vertical extent of contamination for the initial phase of the cleanup would meet the "AOC background" values. That is, levels above LUT would not be allowed to be left in place and covered with fill, for later excavation and completion in a follow-on phase of work. DOE would prepare a Sampling and Analysis Plan to describe proposed soil characterization activities and would prepare a cleanup decision document to describe subsequent soil cleanup in the HWMF area.

DOE would conduct pre-demolition sampling and surveying of building materials. Pre-demolition decontamination sampling would be conducted to: (1) allow for safe handling of demolition debris; (2) determine and document proper handling of various wastes; and (3) prevent release of chemical contamination during transfer to the appropriate offsite disposal facilities. The building debris estimates for closure of the HWMF would be further defined in the associated closure plan. Estimates of building debris are provided in **Table 3-14**.

TABLE 3-14
HWMF CLOSURE BUILDING DEBRIS ESTIMATES

Building	Decommissioned Concrete Class I Hazardous Waste (CY/tons)	Decommissioned Debris/Steel Class I Hazardous Waste (CY/tons)	Hazardous Waste (CY/tons)	ACM (CY)	Truckloads [A, B,]
Building 4029	21/32	18/27			**3**
Building 4133	123/185	34/3	0.9/1.4	0.4	**10**
Totals	**144/217**	**52/30**	**0.9/1.4**	**0.4**	**13**

Notes:
A Assume approximately 23-ton payload per truck trip.
B Assume approximately 1.5 tons per cubic yard debris.
ACM – asbestos containing material
CY – cubic yards
Source: CDM, 2015b.

Building debris that was derived from the HWMF is proposed for disposal at one of the offsite hazardous waste disposal facilities listed in Table 3-6. The HWMF Closure Plan would describe specific methods to be employed during the decontamination and demolition.

Demolition and Equipment Staging

After decontamination of the building materials is completed, the buildings would be demolished using standard construction equipment and demolition techniques. The proposed construction equipment includes water trucks, sweepers, cranes, backhoes and/or excavators with impact chisels and grapplers, front-end loaders, forklifts, concrete saws, various handheld power tools, high dump trucks, and semi-trailers with roll-off bins.

Three staging areas would be used for the work. The first would be shared with other DOE Area IV cleanup activities and would be located in the central portion of Area IV in the vicinity of Building 4024 which is currently paved (see Figure 3-10). It would include the contractor trailer, worker parking, portable restrooms, construction/excavation vehicle parking, and decontamination pad. The HWMF debris staging area would be in the immediate vicinity of Buildings 4029 and 4133 on existing paved areas. Both would be within an existing paved area and would not require grading or significant vegetation clearance.

Truck wheels and undercarriages would be washed prior to exiting Area IV in a fully contained wheel-wash area. Wheel-wash wastewater would be disposed of at an appropriate waste facility (see Table 3-6).

Building debris would be staged on intact concrete/pavement and/or on top of a plastic liner for onsite sorting and characterization for disposal. Debris piles and transport bins with the potential to create dust would be covered to prevent airborne release. The existing stormwater control and NPDES monitoring system would remain in place during demolition. These control systems capture approximately 99 percent of the runoff from Area IV.

Disposal Facilities

Potential disposal facilities are presented in Table 3-6. The specific disposal facilities to be used during closure would be identified before demolition activities begin. Selection of facilities to accept the debris would be evaluated as part of the HWMF Closure Plan development. DTSC would have authority over the final disposition of waste from the HWMF, because the HWMF (Buildings 4029 and 4133) has been released for unrestricted use (USEPA, 2012).

Backfilling/Restoration

Restoration of the HWMF area is expected to be delayed until DOE completes characterization of the soil beneath Buildings 4029 and 4133. Investigation, remediation and final restoration would be conducted per the requirements of the AOC, the details of which would be provided in a subsequent cleanup decision document. In the interim, DOE would place the former HWMF building areas in a safe and stable configuration to facilitate investigation under the AOC. The details related to the safe and stable configuration would be presented in the Final HWMF Closure Plan.

3.7.4.4 Area I/III Impoundment Post-Closure

Five historical surface impoundments[21] (Engineering Chemistry Laboratory, Advanced Propulsion Test Facility 1, Advanced Propulsion Test Facility-2, System Test Laboratory-IV-1, and System Test Laboratory-IV-2) in Areas I and III were closed under the RCRA permitting program in the late-1980s. The former impoundments range in area between approximately 780 and 9,300 square feet and are shown in **Figure 3-14**.

Closure activities, which were previously completed in the 1980s, included excavation and offsite disposal of the residual wastes, liquids, sediments, liner and underlying contaminated soils. Some underlying contaminated material remains in the bedrock and the groundwater has been contaminated from past releases from the surface impoundments. In order to manage the residual contamination a post-closure permit, that defines the required activities associated with the Area I/III Impoundment permit was issued in 1995. The required activities would include monitoring, characterization as necessary, and periodic maintenance.

In order to continue to manage this residual contamination, Boeing would prepare and implement a post-closure plan, under the post-closure requirements, to ensure that human health and the environment are sufficiently protected from residual contamination. Details of the maintenance activities would be described in the Area I/III Post-Closure Plan. The primary maintenance activities would include ongoing maintenance of the surface impoundment caps, surface water diversion features, and maintenance of the monitoring well network used to evaluate ongoing groundwater conditions. Monitoring would include regular inspections of the caps by a work crew of up to three people, diversion features and monitoring wells, and ongoing evaluation and reporting of the impacted groundwater, in accordance with the conditions stipulated in the corresponding water quality sampling and analysis plan.

DTSC will evaluate the need for additional cleanup at the impoundments based on the results of the RFIs for these areas. Any additional remedial actions, if necessary would be described in subsequent cleanup decision documents to be prepared under the 2007 Consent Order, and may require subsequent environmental review.

3.7.4.5 Area II Impoundment Post-Closure

Four historical surface impoundments (Alfa Bravo Skim Pond, Storable Propellant Area 1 and Storable Propellant Area 2, and Delta) in Area II were closed under the RCRA permitting program in the mid-1980s. The impoundments range in area between approximately 800 and 22,125 square feet and are shown in Figure 3-14. The anticipated post-closure activities are the same as those described previously for the Area I/III surface impoundments. However, NASA would be conducting this work and the overall schedule would be balanced with NASA and DTSC priorities for Area II.

[21] An impoundment is a lined retention pond primarily used to manage liquid waste.

3.7.5 Schedule and Workforce

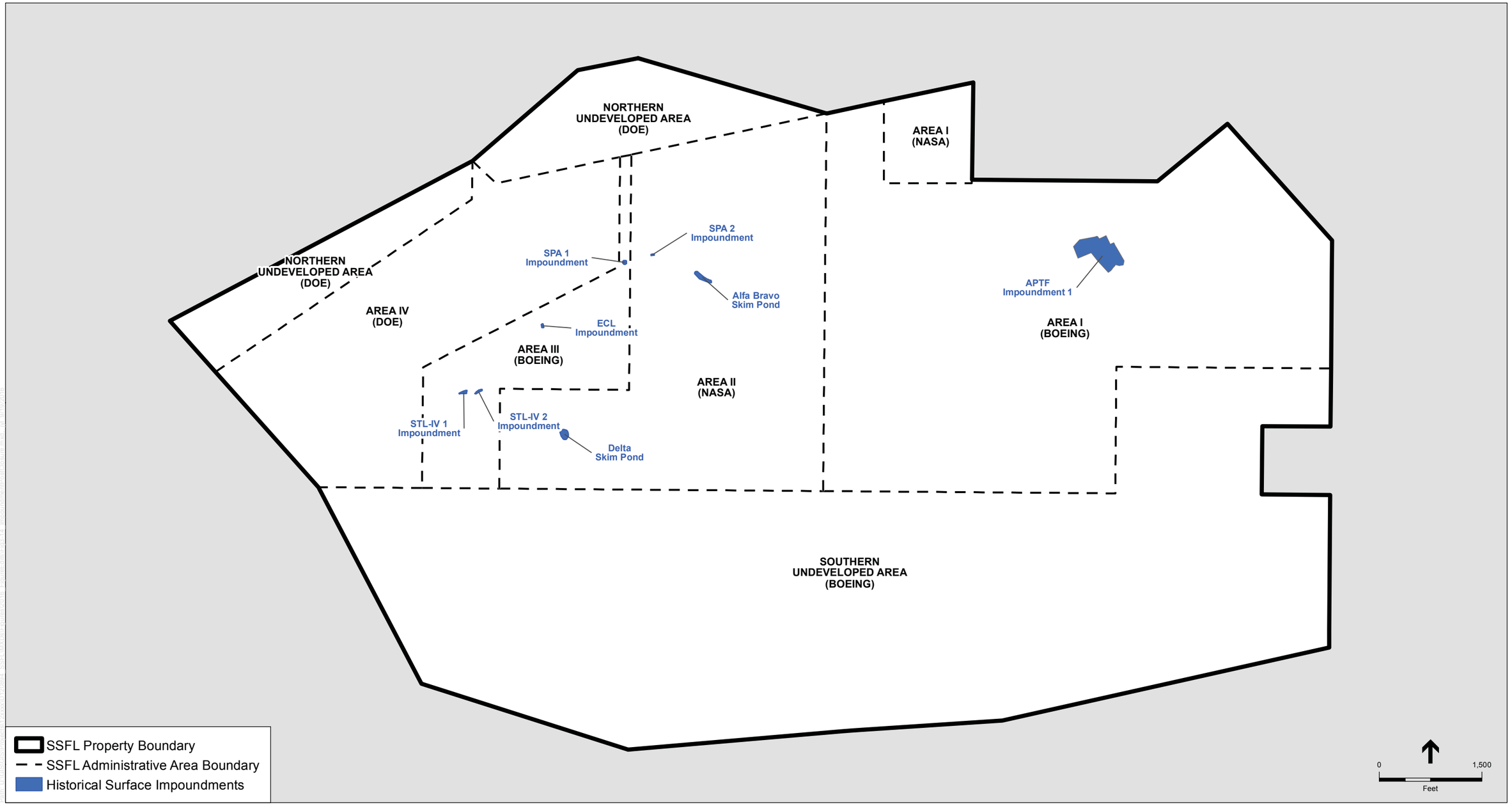
Table 3-15 presents the construction activities, schedule, and workforce and equipment assumptions for each initial project.

Cleanup activities associated with the initial projects described in Section 3.7 would commence after certification of the Final PEIR and activities would occur for approximately 3 to 5 years, and would consist of primarily soil excavation and offsite disposal of soil and demolition. Monitoring and maintenance would likely continue beyond the foreseeable future. This predicted variability is based on factors such as scheduling, the complexity of various projects stages (i.e., building removal, excavation, backfilling, confirmation sampling etc.), coordination between the RPs, determination of final soil excavation volumes, and project initiation and ability to ramp up.

3.8 Permits or Approvals Potentially Required

Permits and other approvals required for the implementation of the proposed project are anticipated to include, but are not limited to, those listed in **Table 3-16** below, which includes permits or approvals that were previously issued for the SSFL site (e.g., NPDES or Post-Closure Permit) as well as new permits or approvals that may be required, or existing permits or approvals that may need to be modified or renewed.

While the activities associated with such permits and approvals are evaluated in this PEIR, they are not necessarily integral to the cleanup requirements and may be processed independently, subject to the discretion of the permitting agency. In addition, certain state and local permits and other approvals listed may not be applicable to DOE and NASA based on their federal status.



SOURCE: MWH 2013; ESA 2015

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Figure 3-14

Impoundment Post-Closure Permit Renewals

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TABLE 3-15
CONSTRUCTION DETAILS FOR INITIAL PROJECTS

Project	Activities	Volume	Estimated Duration	Workers	Haul Trucks [A,B]	Construction Equipment
DOE Area IV Radiological and Contiguous Chemical Contaminated Soil Removal	Vegetation clearance, excavation, truck loading/hauling, monitoring, backfill, revegetation	300,000 CY disposal [C] 225,000 CY backfill	3 to 5 years	10	35,880 (disposal and backfill)	dozers, scrapers, loaders, excavators, high dump truck and semi-trailers with roll-off bins, water trucks, street sweepers, cranes, impact chisels, grapplers
NASA Liquid Oxygen Plant	Vegetation clearance, excavation, truck loading/hauling, monitoring, backfill, revegetation	73,500 CY disposal [D] 24,500 backfill	15 months	10	6,400 (disposal and backfill)	dozers, scrapers, loaders, excavators, high dump truck and semi-trailers with roll-off bins, water trucks, street sweepers, cranes, impact chisels, grapplers
Building Demolition – DOE	Demolition, excavation, truck loading/hauling, backfill, restoration	11,500 CY [E]	3-5 years	26	750	water trucks, sweepers, cranes, backhoes, excavators, front-end loaders, forklifts, concrete saws, high dump truck, semi-trailers, roll-off bins
RCRA-Permitted Unit Activities						
TTF	Excavation, disposal, monitoring, backfill, restoration	300 CY excavation [F] 100 CY backfill	6 months	5	26	dozers, scrapers, loaders, excavators, high dump truck on-highway haul trucks and semi-trailers with roll-off bins, water trucks, street sweepers, cranes, impact chisels, grapplers, vacuum trucks, compactors, light-duty trucks
RMHF	Demolition, excavation, truck loading /hauling, backfill, restoration	3,800 CY debris [E]	6 months	10	250	water trucks, sweepers, cranes, backhoes, excavators, front-end loaders, forklifts, concrete saws, high dump truck, semi-trailers, roll-off bins
HWMF	Demolition, excavation, truck loading /hauling, backfill, restoration	197 CY debris [E]	3 months	10	13	water trucks, sweepers, cranes, backhoes and/or excavators, front-end loaders, forklifts, concrete saws, high dump truck, semi-trailers, roll-off bins
Area I/III Impoundment	Groundwater monitoring and impoundment maintenance (checking concrete diversion channels and maintaining vegetative cover)	NA	Ongoing for 30+ years	3	NA	worker vehicles, light-duty trucks
Area II Impoundment	Groundwater monitoring and impoundment maintenance (checking concrete diversion channels and maintaining vegetative cover)	NA	Ongoing for 30+ years	3	NA	worker vehicles, light-duty trucks

A. Haul trucks include both disposal and backfill trucks.
B. Truck trips calculated assuming truck volume capacity of 15.33 CY per truck (23 tons per truck load, and 1.5 tons per in situ CY of soil).
C. DOE, 2015a.
D. NASA, 2015b.
E. CDM, 2015b.
F. CH2M Hill, 2015.

TABLE 3-16
POTENTIAL PERMITS, APPROVALS REVIEW AND CONSULTATION REQUIREMENTS

Agency	Potentially Required Permit or Approval
Federal	
United States Army Corps of Engineers	• Clean Water Act Section 404 Permit for fill or discharge of dredged or fill material into waters of the United States
United States Fish and Wildlife Service	• Endangered Species Act Section 10 Incidental Take Permit for impacts to federally listed species • Biological Opinion
United States Department of Energy	• Record of Decision (ROD) for the EIS for Remediation of Area IV and the Northern Buffer Zone of the Santa Susana Field Laboratory
National Aeronautics and Space Administration	• ROD for the Environmental Impact Statement for Demolition and Environmental Cleanup Activities for the NASA Administered Portion of the Santa Susana Field Laboratory
State of California	
California Department of Public Health Services, Radiologic Health Branch (CDPH)	• Enforce radiation control laws and regulations • While CDPH does not have regulatory authority over the activities at SSFL; DTSC will consult with CDPH and will request that CDPH verify radiological cleanup procedures and activities.
California Department of Toxic Substances Control	• Certification of Environmental Impact Report • Program Management Plan • Remedial Investigation(s) • Data Summary Report(s) • Corrective Measures Study Reports • Corrective Measures Implementation Work Plan(s) (CMI WP[s]) • Corrective Measures Operation and Maintenance Plan • Corrective Measures Plans and Specifications • Corrective Measures Construction Work Plan • Corrective Measures Construction Completion Report • Corrective Measures Completion Report • Schedule for Corrective Action Implementation • Soils Remedial Action Implementation Plan(s) (SRAIP[s]) • Post-Closure Permits Renewal Application(s) • RCRA-Permitted Facilities Closure Plan(s)
California Department of Fish and Wildlife	• Section 1602 Streambed Alteration Agreement for alteration of bed, bank, or channel (Waters of the State) • California Endangered Species Act Sections 2081(b) and (c) Incidental Take Permit for impacts to state listed species
California Department of Transportation, District 7	• Permit for use of heavy equipment on state highways.
California State Historic Preservation Officer	• Section 106 of the National Historic Preservation Act Consultation (by federal lead agency as applicable) and associated Programmatic Agreement
California State Water Resources Control Board	• NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance.

Agency	Potentially Required Permit or Approval
Regional/County	
Regional Water Quality Control Board	• Section 401 Water Quality Certification for streambed modifications • Waste Discharge Requirements and NPDES Permits for Stormwater Discharges • Area I Landfill Corrective Measures Implementation Plan and Completion Report Review
Ventura County Air Pollution Control District	• Rule 55 (Fugitive Dust) requirements during construction activities • Rule 74.29 Soil Decontamination Operations requirements • Authority to Construct, Permit to Operate.
Ventura County Resources Management Agency, Environmental Health, Solid Waste Program	• Onsite Hazardous Waste Treatment/Tiered Permit by Rule (GETS) • Waste disposal plans included in Corrective Action Implementation Work Plans
Ventura County, Resource Management Agency, Planning Division	• Tree Permit for removal, alteration, and/or construction within the Tree Protection Zone of protected trees • Zoning Clearances
Ventura County, Public Works Agency, Transportation Department	• Haul Route Plan, Construction Traffic Management Plan and/or Traffic Control Plan
Los Angeles County, Public Works Agency, Transportation Department	• Haul Route Plan, Construction Traffic Management Plan, and/or Traffic Control Plan
City of Los Angeles, Public Works, Department of Transportation	• Construction Work Site Traffic Control Plan • Haul Route Permit
Ventura County, Resource Management Agency, Watershed Protection District	• Well Permit for decommissioning water supply wells and installation of treatment and monitoring wells • Watercourse Permit (as applicable to work performed in District jurisdictional channels)
Ventura County, Resource Management Agency, Division of Building and Safety	• Building and Grading Permits
Ventura County, Resource Management Agency, Environmental Health Division	• Area I Landfill Corrective Measures Implementation Plan and Completion Report (VC landfill #56-CR-0051)
Ventura County, Fire Protection Division	• Hazardous Materials Permit

CHAPTER 4
Environmental Setting, Impacts, and Mitigation

4.0.1 Scope of this Analysis

The focus of this chapter is on overall site cleanup and initial activities that were found to have the potential to result in significant adverse impact to the physical environment. Sections 4.1 through 4.13 discuss the existing environmental setting (or conditions), environmental impacts associated with implementation of the project, and mitigation measures to avoid or substantially reduce significant impacts, where necessary, for the following resource areas:

- Aesthetics (Section 4.1)
- Air quality (Section 4.2)
- Biological resources (Section 4.3)
- Cultural resources (Section 4.4)
- Geology, soils, and seismicity (Section 4.5)
- Greenhouse gas (Section 4.6)
- Hazards and hazardous materials (Section 4.7)
- Hydrology and water quality (Section 4.8)
- Land use and planning (Section 4.9)
- Noise (Section 4.10)
- Transportation and traffic (Section 4.11)
- Utilities and service systems (Section 4.12)
- Energy consumption (Section 4.13)

It was determined that several issue areas would not be affected by implementation of the proposed project based on a review of the NOP, public comments received on the NOP, comments from the public scoping meetings, and review of existing information. These issue areas include Agricultural and Forestry Resources, Mineral Resources, Population and Housing, Public Services, and Recreation. Chapter 7.0, *Impacts Found Not to be Significant*, of this PEIR provides a summary of those issue areas for which a detailed analysis is not included and the basis for those determinations.

4.0.2 Environmental Impact

Each section in this chapter addresses a specific resource area as listed above and includes the following components:

- **Environmental Setting:** Describes the physical characteristics and existing environmental conditions within and in the vicinity of the project area.
- **Regulatory Setting:** Presents information on the laws, regulations, plans, and policies that relate to the issue area being discussed. Regulations originating from federal, state, and local levels are discussed as appropriate.
- **Thresholds of Significance:** Presents the criteria established by the lead agency to identify at what level an impact would be considered significant.
- **Methodology:** Describes the methodology used for the analysis of each resource.
- **Analysis of Project Impacts:** Analysis of the nature and extent of potential project impacts. These analyses address direct (or primary) effects of the project as well as the indirect (or secondary) impacts. This subsection also provides any mitigation measures used to reduce or eliminate project impacts.
- **Mitigation Measures:** Lists all mitigation measures recommended for the project.
- **Impact Summary:** A summary of impacts and mitigation measures is provided.

4.0.3 Terminology Used in This PEIR

This PEIR includes the following CEQA terminology to denote the significance of environmental impacts of the proposed project:

- **Less than significant impact:** A less than significant impact does not result in a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance (see CEQA Guidelines Section 15382). Impacts determined to be less than significant do not require mitigation measures.
- **Significant impact:** PRC Section 21068 defines a significant impact as "a substantial, or potentially substantial, adverse change in the environment." The environmental checklist included as Appendix G of the CEQA Guidelines provides additional guidance for determining which impacts would be regarded as significant. This PEIR applies the thresholds contained within Appendix G of the CEQA Guidelines and uses the CEQA definition of "significant impact." Feasible mitigation measures or alternatives to the project must be identified and adopted if they would avoid or substantially reduce the significant impact.
- **Potentially significant impact:** A potentially significant impact is one that, if it were to occur, would be considered a significant impact as described above; however, the likelihood of the impact's occurrence is uncertain. For example, although the PEIR may provide evidence that buried archaeological resources could be found in a particular location, the actual discovery cannot be determined until the time of project construction. For CEQA purposes, a potentially significant impact is treated (i.e., mitigated) as if it were a significant impact. Feasible mitigation measures or alternatives to the project must be identified and adopted if they would avoid or substantially reduce the significant impact.

- **Significant and unavoidable impact:** A significant and unavoidable impact is a substantial adverse effect on the environment that cannot be mitigated to a less than significant level. A project with significant and unavoidable impacts could still proceed, but DTSC would be required to prepare a statement of overriding considerations, pursuant to CEQA Guidelines Section 15093, explaining why DTSC would proceed with the project in spite of the potential for significant environmental impacts.
- **Threshold of significance:** A threshold of significance is a criterion applied by the lead agency to identify significant adverse environmental impacts. A threshold is defined by a lead agency based on examples found in CEQA or the CEQA Guidelines, scientific and factual data relative to the lead agency jurisdiction, views of the public in affected areas, the policy/regulatory environment of affected jurisdictions, and other factors.

4.1 Aesthetics

The purpose of this section is to analyze potential aesthetics impacts that could occur from the overall site cleanup and initial activities. This analysis identifies and evaluates key visual resources in the project area, determines the degree of visual impacts that could occur from project implementation, describes the potential aesthetic effects of project development on the existing landscape, and analyzes the compatibility of the overall site cleanup and initial activities on scenic resources.

4.1.1 Environmental Setting

4.1.1.1 Regional and Local Landscape Setting

The project is located in southeast Ventura County within the Simi Hills, which form an approximately 16-mile-long and 8-mile-wide portion of the geomorphic province known as the Traverse Ranges, with the highest point being Simi Peak at an elevation of 2,401 feet above mean sea level (AMSL). The hills lie almost entirely within southeastern Ventura County, with some southern and eastern foothills within western Los Angeles County. The areas around the eastern Simi Hills were inhabited by several Native American groups and are considered culturally significant. The visual character of the area surrounding the project includes dense suburban communities in wide valleys surrounded by undeveloped rolling hills, canyons, mixed hardwood forests, sage scrub, chaparral, and grasslands.

4.1.1.2 Project Site Setting

The project site occupies approximately 2,850 acres, with elevations ranging from about 1,175 feet AMSL along the south to 2,245 feet AMSL to the north near the crest of the Simi Hills. The predominant land use in the surrounding area consists of large-scale suburban tract-housing developments interspersed with undeveloped open space. Developed land uses within the project site include roads, buildings, and other infrastructure associated with its past use as a scientific research and test facility. Some areas of the project site are composed of open space, much of which remains in an undisturbed natural condition. Vegetation in these areas is composed of various coastal sage scrub and chaparral plant communities, oak woodland, mulefat scrub, and annual grassland. A large portion of the site was previously developed and contains little or no native vegetation.

There are certain locations within the boundaries of the project site that are considered sacred sites, such as rock shelters with pictographs and summits of the highest peaks, which were gathering places for indigenous people. Section 4.4, *Cultural Resources*, of this PEIR provides a more detailed discussion of the archaeological and historical resources within the project site.

Land uses immediately adjacent to the project site include open space in the form of public and private land and residential areas. San Fernando Valley communities, including Canoga Park, West Hills, and Chatsworth are located to the east, with residences located as close as 0.3 mile from the eastern boundary of the project site. The southern portion of the project site contains

undeveloped lands, which abut the northern edge of the residential community of Bell Canyon. Additional developed land uses in the vicinity of the project include the American Jewish University on adjacent property located approximately 1 mile northwest of the northern portion of the site.

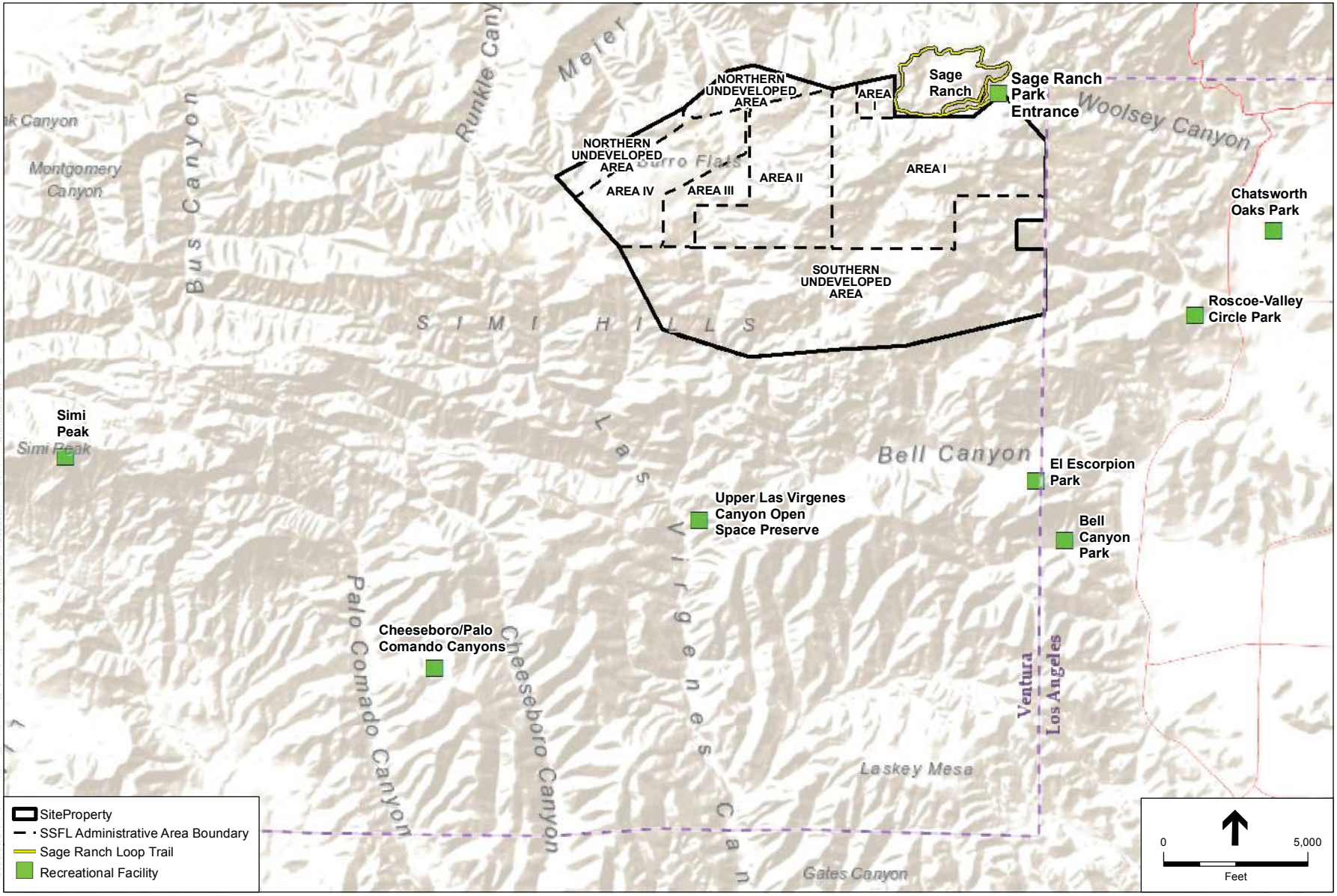
Other parks and open space surrounding the project site include trails that traverse the ridgelines and peaks around the project site, many with views of Simi Valley, Conejo Valley, and San Fernando Valley on clear days. Among these is the Upper Las Virgenes Canyon Open Space Preserve, located immediately adjacent to the southwestern boundary of the project, and the Cheeseboro/Palo Comado Canyons, located approximately 1.5 miles southwest. Open spaces are typically used for purposes such as preservation of natural resources, passive outdoor recreation, and scenic and visual enjoyment. In addition, Sage Ranch Park is immediately adjacent to the northeast corner of the project site and contains the Sage Ranch Loop Trail, which generally follows the northern boundary of the project site (**Figure 4.1-1**). Other recreational parks within 2 miles of the project site include: Chatsworth Oaks Park and Roscoe Valley Circle Park to the east and El Escorpian Park and Bell Canyon Park to the southeast.

4.1.1.3 Project Viewshed

Defining the Project Viewshed

A project viewshed is defined as the general area from which a project would be visible or could be seen. For purposes of describing a project's visual setting and assessing potential visual impacts, the viewshed, or "seen area," can be broken down into distance zones of foreground, middleground, and background. The foreground is defined as the zone within 0.25 mile to 0.5 mile from the viewer. The middleground can be defined as a zone that extends from the foreground up to 3 to 5 miles from the viewer, and the background extends from about 3 to 5 miles to infinity from the viewer (Smardon et al., 1986; USDA, 1995). In the foreground, landscape detail is typically most noticeable and objects generally appear most prominent. At middleground viewing distances, the texture of landscape features such as rock outcropping surfaces and vegetation as well as built elements may be noticeable but are increasingly unrecognizable. In the background, visible detail is limited to landscape patterns or visual contrasts.

As described in Chapter 3.0, *Project Description,* of this PEIR, the overall site cleanup would include activities on up to approximately 541 acres of the project site, including building demolition, soil excavation and offsite disposal, as well as backfilling to approximately mimic natural contours. Proposed onsite treatment would also require use of remediation equipment that would be visible within the project viewshed. Equipment to be used for the overall site cleanup would include cranes, backhoes and/or excavators with impact chisels and grapplers, front-end loaders, forklifts, concrete saws, various handheld power tools, dozers, loaders, excavators, scrapers, on-highway haul trucks, vacuum trucks, compactors, a mobile centrifuge dewatering unit for saturated sediments in ponds, water trucks, street sweepers, high dump truck, semi-trailers with roll-off bins, and light-duty trucks.



SOURCE: Santa Monica Mountains Conservancy

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Figure 4.1-1

Recreational Facilities

Taller equipment, such as a crane, is likely to be visible primarily in the foreground. Given the scale and potential visibility of the equipment, this analysis is primarily focused on foreground viewing distances. Although consideration is also given to the potential effects on middleground and background views, background views are not included on the viewshed map because these views are very limited or non-existent due to viewing distance, topography, and built features within the areas that screen views.

SSFL Viewshed Map

A topographic viewshed map that covers the project cleanup areas was prepared to depict generalized areas from which soil cleanup areas could potentially be visible at foreground and middleground distances up to 3 miles away. The viewshed map was prepared using computer-assisted modeling techniques and is presented as **Figure 4.1-2.** The map is based on digital topographic and project data. A description of the technical methods and assumptions employed to create the viewshed map follows below and in the following pages.

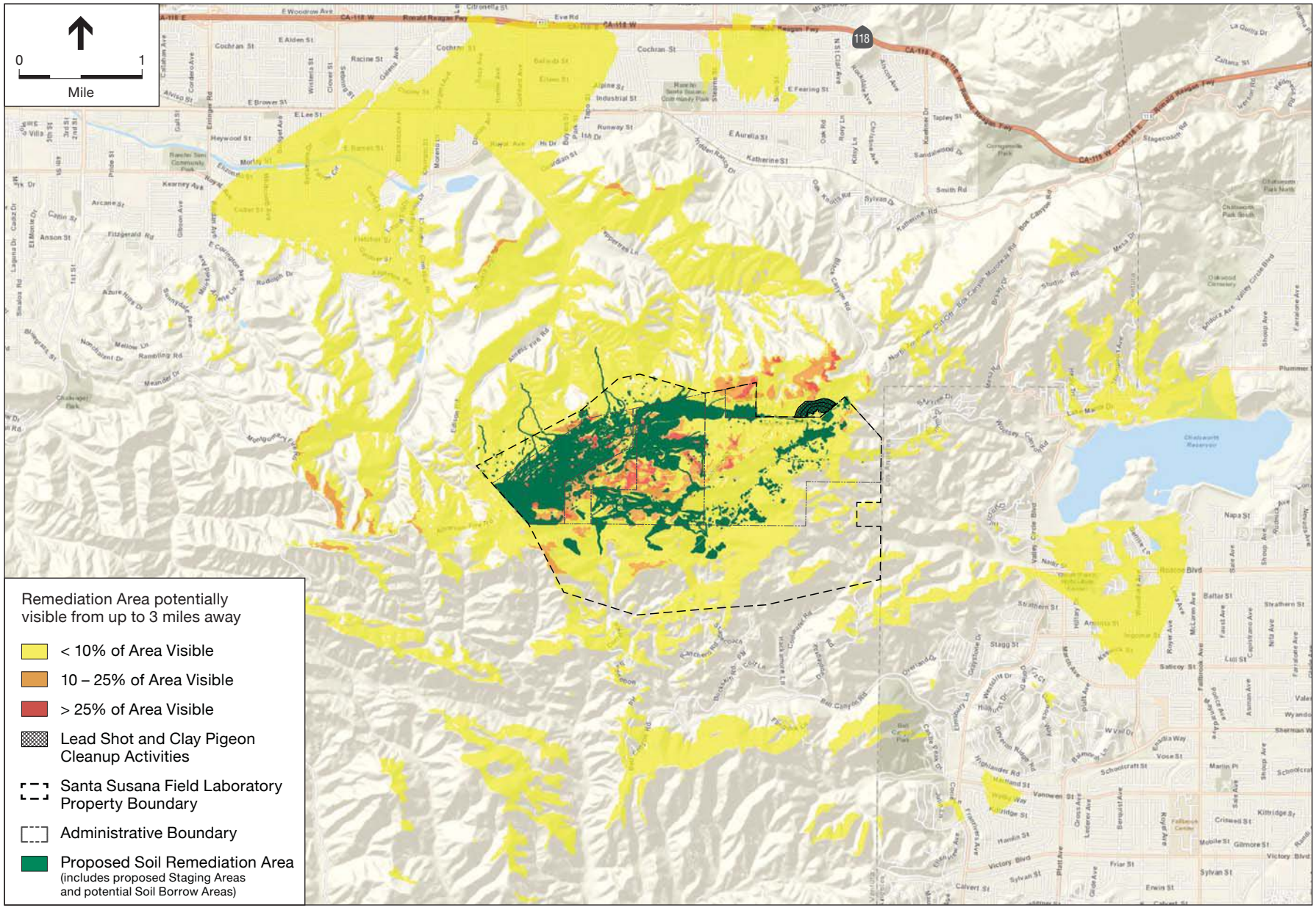
The proposed cleanup area is shaded green. The map uses the following color scheme to indicate relative potential visibility of the project site within a 3-mile radius (for areas where no color is indicated on the map, the project site is not visible from that location):

- Yellow indicates less than 10 percent of the project site is visible from that location.
- Orange depicts 10 to 25 percent of the project site is visible from that location.
- Red depicts more than 25 percent of the project site is visible from that location.

The viewshed map was produced using ArcMap 10.2 computer software and a 3D topographic-based computation from project data and digital elevation data from the U.S. Geological Survey (USGS) National Elevation Dataset. The elevation data for the 1/3 Arc second National Elevation Dataset have a horizontal resolution of approximately 10 meters. The ArcMap viewshed calculations used an aboveground height of 1 foot for the SSFL project site and an aboveground observer height of 5 feet. The viewshed map is intended to offer a generalized sense of visibility of different areas within the site. Actual visibility would vary depending on height of equipment, infrastructure, and stockpiles at the site; location and activity of the viewer; and topography and vegetation at the site and from the viewer's location.

Further, the viewshed map considers only topographic screening, and in this respect, it presents a conservative assessment of project visibility because, in most instances, views of the project site are also partially or completely screened by existing vegetation and facilities.

The viewshed map indicates that visibility of the project site (and cleanup areas) within the SSFL boundary varies ranging in visibility from less than 10 percent to greater than 25 percent. Areas within the project site that have the highest visibility would include portions of Areas I, II, and III that are relatively flat and adjacent to other areas lacking topographic complexity. In addition, elevated areas overlooking other portions of the project site have increased visibility as well.



SOURCE: Environmental Vision; ESRI

Santa Susana Field Laboratory . 120894

Figure 4.1-2
Generalized Viewshed Map

Visibility outside of the SSFL boundary is limited, as the site is primarily observable to the public from some nearby locations, particularly in public open space. In addition, portions of undeveloped private land, fire roads, the city of Simi Valley, Conejo Park, and near the community of Bell Canyon experience visibility of the project site ranging from less than 10 percent to 25 percent. Some areas are also less than 10 percent visible from SR 118, an Eligible State Scenic Highway, located approximately 2.5 miles north of the project site. Visibility from Sage Ranch Park, outside the SSFL project boundary, ranges from less than 10 percent to greater than 25 percent to users of the park and, particularly, of the Sage Ranch Trail. Elevated areas within the park and along the trail provide the greatest visibility of the project site.

Generally, areas that are most visible include those within the foreground viewing distance and are comprised of relatively flat sections within the project site, as well as the high-elevation ridgelines within Sage Ranch Park to the north, open space surrounding Bell Canyon to the south, and open space to the east. While the viewshed map shows areas where portions of the SSFL site are potentially visible, in many cases mitigating factors such as the presence of vegetation and topographic screening minimize actual visibility. Views from areas surrounding the project site are partially or completely blocked by intervening vegetation, particularly in residential areas where mature trees are abundant. In other cases, for example along the SR 118 corridor, built elements restrict views of the surrounding landscape. For this viewshed assessment, it is assumed that if a portion of a specific cleanup area can be seen, then at least some portion of activities associated with the overall site cleanup and initial activities (described in detail in Chapter 3.0, *Project Description*, of this PEIR) would be visible within the cleanup areas as well. While the viewshed map shows the generalized pattern of project visibility, it does not distinguish how much of the activity in question may be visible from a given location within the viewshed. Moreover, project activities that the viewshed map indicates as being potentially visible may not be perceptible to casual observers, especially when considering more distant views. Therefore, proposed project activities and associated equipment are unlikely to be visible to the unaided eye at distances beyond the foreground viewing distance (0.25 mile).

4.1.1.4 Potentially Affected Viewers

Accepted visual assessment methods, including those adopted by federal agencies, establish sensitivity levels as a measure of public concern for changes to scenic quality (FHWA, 1988). Viewer sensitivity, typically divided into categories of high, moderate, and low, is among the criteria employed for evaluating visual impacts and their degree of significance. The factors considered in assigning a sensitivity level include viewer activity (and viewers' expectations, as influenced by their activity), view frequency and duration, viewing distance, adjacent land use, types of individuals and groups of viewers, and special management or planning designation. Research on the subject suggests that certain activities tend to heighten viewer awareness of visual and scenic resources, while other activities tend to be distracting. For example, recreational activities tend to favor attention to scenery while working at a construction site does not. In general, the degree of visual impact tends to be more substantial where the sensitivity of affected viewers is highest.

Potentially affected viewers in the project viewshed include recreational visitors using nearby trails and surrounding public open space, motorists on SR 118 and adjacent roadways, and local residents.

Recreational Visitors

Recreational visitors can view the project site from trails that traverse the surrounding open space including: Sage Ranch Park, Chatsworth Oak Park, Chatsworth Reservoir, Roscoe Valley Park, El Escorpian Park, Upper Las Virgenes Canyon Open Space Preserve, Cheeseboro/Palo Comado Canyons, Bell Canyon Park, and other trails maintained by the Bell Canyon community (Figure 4.1-1). These facilities offer recreational opportunities for hikers, bicyclists, equestrians, wildlife viewing enthusiasts, and picnickers. Camping is also offered at the Sage Ranch Campground.

Specifically, areas from which the project site can be seen by recreational visitors include the Sage Ranch Loop Trail, the Cheeseboro Ridge Trail, Albertson Fire Road, as well as trails maintained by the Bell Canyon community. The Sage Ranch Loop Trail is a part of the 625-acre Sage Ranch Park, located adjacent to the northern boundary of the project site and is managed by the Santa Monica Mountains Conservancy. The trail is a 2.6-mile loop trail that generally follows the northern portion of the SSFL project site (SMMC, 2015). The Cheeseboro Ridge Trail follows the ridgeline that separates the Upper Las Virgenes Canyon Open Space Preserve and the Cheeseboro and Palo Comado Canyon Open Space. It then leads to the Sheep Corral Trail within the Cheeseboro and Palo Comado Canyon Open Space, which is located in the Santa Monica Mountains National Recreation Area (NRA) and managed by the National Park Service (NPS, 2014). Simi Peak is within the NRA and accessed by these trails, in addition to the Albertson Fire Road, which is on private land but open for public use. Overall viewer sensitivity for recreational visitors is considered high.

Motorists

Motorists include both local and regional travelers who are familiar with the visual setting and travelers using the roadway on a less regular basis. Most motorist views are those from SR 118 (an Eligible State Scenic Highway), which constitutes the primary east-west transportation corridor within the region and is a conduit for a large volume of traffic. Motorists traveling on Valley Circle Boulevard, Tapo Canyon Road, and other local roads can also view the site. Roadway views of the project site are typically brief in duration, while in many instances views are completely screened by intervening topography and vegetation. Overall sensitivity for motorists is considered low to moderate.

Residents

Residential views are typically longer in duration and views are one of many factors that influence residential location choice. Residential developments in the viewshed include Bell Canyon, Canoga Park, Simi Valley, Santa Susana, Oak Park, and Chatsworth. Residents that are in proximity (within the foreground viewing distance) to the project site include those immediately to the south within Bell Canyon and to the east in Woolsey Canyon. However, in

many instances views would be completely screened by intervening topography and vegetation. Overall viewer sensitivity for residents is considered low to moderate.

Other

The American Jewish University's Brandeis-Bardin Campus is located approximately 1 mile north of the northern boundary of the project site (see Figure 3.1-1). The main campus is located within a valley between two mountains and offers spaces for special events, religious and educational retreats, and conferences. The House of the Book hall is a mountaintop facility on the campus that hosts these events and provides views of the surrounding area. However, because of the distance of the House of the Book hall from the project site and steep mountainous topography between the project site and the House of the Book hall, the project site is not visible from this location. Overall viewer sensitivity from the Brandeis-Bardin Campus and the House of the Book hall is considered low.

4.1.1.5 Visual Character and Representative Views of the Project Site

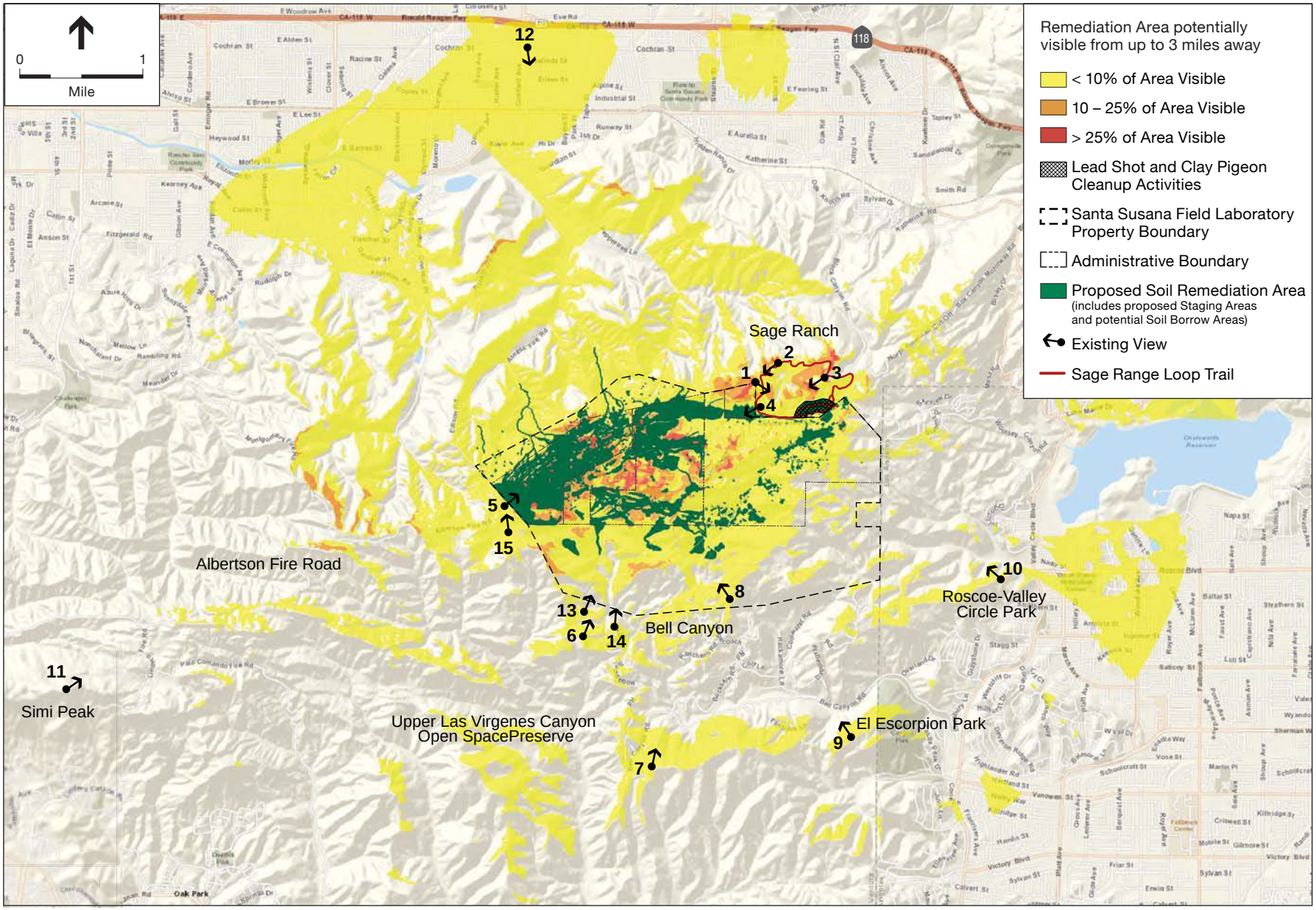
Figure 4.1-3 shows the location and orientation of selected viewpoints for the project site. **Figures 4.1-4a** through **4.1-4h** present a set of photographs (1 through 14) depicting existing visual conditions from these viewpoints, whereas photograph 15 illustrates representative views from within the project site looking outward. Together, these viewpoints convey a general sense of the visual landscape character found in the project site vicinity.

Views Toward the Project Site

Views from Public Lands Adjacent to the Project Site

Viewpoints 1 and 2 (Figure 4.1-4a) were taken from Sage Ranch Park adjacent to the Area I boundary and are looking southwest toward the project site. Sage Ranch Park is accessible to local residents and other visitors who hike, mountain bike, camp, picnic, and enjoy other recreational activities. Views in this area are potentially of longer duration as a result of access to multiple vantage points and unobstructed vistas of surrounding scenery

View 1(Figure 4.1-4a) is taken from the Sage Ranch Loop Trail looking southeast, and overlooks a portion of Sage Ranch Park adjacent to the northern portion of Boeing-owned Area I. Rolling hills with rock outcrops and low laying vegetation can be seen throughout the foreground, middleground and background. The loop trail can be seen in the middleground, and portions of the Service Area Road are visible beyond the trail. The Boeing SSFL administrative buildings, fire station, and equipment staging areas are seen in the distance.



SOURCE: Environmental Vision; ESRI

Santa Susana Field Laboratory . 120894

Figure 4.1-3
Existing View Locations

View 1- from rock outcropping along Sage Ranch Loop Trail looking southeast toward SSFL Area I.

View 2- from Sage Ranch Loop Trail looking southwest toward the SSFL site.

SOURCE: Environmental Vision

Santa Susana Field Laboratory . 120894

Figure 4.1-4a

Existing Views 1 and 2

View 3-from the Sage Ranch parking lot and picnic area, looking southwest toward the SSFL site.

View 4- view of NASA Liquid Oxygen Plant area from Sage Ranch Loop Trail.

SOURCE: Environmental Vision

Santa Susana Field Laboratory . 120894

Figure 4.1-4b

Existing Views 3 and 4

View 5- from Albertson Fire Road within the Upper Las Virgenes Canyon Open Space Preserve, looking northeast to southwest portion of the SSFL site.

View 6- from Upper Las Virgenes Canyon Trail, near Bell Canyon, looking north towards the Southern Undeveloped Area.

SOURCE: Environmental Vision

Santa Susana Field Laboratory . 120894

Figure 4.1-4c

Existing Views 5 and 6

View 7- from Upper Las Virgeners Cannyon Open Space Preserve, looking north over the community of Bell Canyon towards the southern portion of the SSFL site.

View 8- from Boeing Trail at the Community of Bell Canyon, adjacent to the SSFL site looking northwest towards the Southern Undeveloped Area and Area II.

SOURCE: Environmental Vision

Santa Susana Field Laboratory . 120894

Figure 4.1-4d
Existing Views 7 and 8

View 9- from El Escorpion Park Ridge Trail near the community of Bell Canyon looking northwest toward the southern boundary of the SSFL site.

View 10- from Roscoe-Valley Circle Park Ridge Trail looking northwest toward the eastern portion of the Southern Undeveloped Area and Area I.

SOURCE: Environmental Vision

Santa Susana Field Laboratory . 120894

Figure 4.1-4e

Existing Views 9 and 10

View 11- from Simi Peak looking northeast toward the project site (approximately 4 miles away).

View 12- from Tapo Canyon Road looking south toward the northern side of the SSFL site.

SOURCE: Environmental Vision

Santa Susana Field Laboratory . 120894

Figure 4.1-4f

Existing Views 11 and 12

View 13- from Maverick Lane, within the community of Bell Canyon, looking north towards the southern boundary of the SSFL site.

View 14- from North Corral Road in Bell Canyon, looking north toward the SSFL site.

SOURCE: Environmental Vision

Santa Susana Field Laboratory . 120894

Figure 4.1-4g

Existing Views 13 and 14

View 15-from a fire road adjacent to the western boundary of the site looking north (away from the SSFL site) toward Simi Valley.

SOURCE: Environmental Vision

Santa Susana Field Laboratory . 120894

Figure 4.1-4h
Existing View 15

View 2 (Figure 4.1-4a) is from the Sage Ranch Loop Trail looking to the west. The trail dominates the center of the foreground and can been seen winding through the middleground. Scrub and vegetation can be seen on either side of the trail throughout the foreground and middleground. A large rock outcropping on Santa Monica Mountains Conservatory property is seen on the left side of the photograph. Hardscape areas and buildings associated with the NASA ELV/Service Area can be seen in the middleground. In addition, a large rock outcropping can be seen to the right of the NASA ELV/Service Area, as well as behind it within the middleground. The valley floor with open undeveloped land and the mountain ridgeline are present in the background.

View 3 (Figure 4.1-4b) is from the Sage Ranch parking lot and picnic area, looking southwest toward the project site. It overlooks a grove of oak trees, and a picnic day use area in the foreground while large, boulders and rock outcroppings interrupted by pockets of vegetation can be seen in the middleground. This location affords background views of distant valleys and mountains, as well as portions (Area II, Area III, and Area IV) of the SSFL site, including buildings associated with the NASA ELV/Service Area.

View 4 (Figure 4.1-4b) is from Sage Ranch Loop Trail and looks directly onto the NASA Liquid Oxygen Plant area, which is in the foreground. The NASA Liquid Oxygen Plant area appears to have been previously excavated or graded. This area is relatively flat and contains weeds. No structures are present in this area, with the exception of an at-grade concrete slab. The middle ground shows native chaparral vegetation and an access road. The background shows a vegetated ridgeline and an electric transmission line.

View 5 (Figure 4.1-4c) is from Albertson Fire Road within the Upper Las Virgenes Canyon Open Space Preserve looking northeast toward the southeast portion of the project site. Views include grassy open space with trails and Albertson Fire Road in the foreground, and views of existing equipment and buildings within Area IV in the middleground, as well as large rock outcroppings; the background view includes vegetated mountains. This view is representative of trails and peaks to the southwest of the SSFL site within the viewshed of the project.

View 6 (Figure 4.1-4c) is taken from the Upper Las Virgenes Canyon Trail, near the community of Bell Canyon, looking north towards the Southern Undeveloped Area. Vegetation is seen in the foreground, residential homes, fencing, and landscaping, and mature trees are seen throughout the middleground, while steep rocky hills are seen in the background with low-lying vegetation. The Southern Undeveloped Area is located on the other side of the ridge visible in the background, and two test stands are partially visible on the ridgeline, however the topography of the foothills largely blocks views of the project site itself.

View 7 (Figure 4.1-4d) was taken from the Upper Las Virgenes Canyon Open Space Preserve looking north over the community of Bell Canyon towards the southern portion of the SSFL site. A portion of developed open space can be seen in the immediate foreground, while residential development amongst rolling hills can be seen throughout the rest of the foreground and middleground. Largely undeveloped rocky/sparsely vegetated hills can be seen in the background

and a blue hydrogen tank within Area II can be seen on the hillside in the distance of the right hand side of the view.

View 8 (Figure 4.1-4d) is from the Boeing Trail, accessed from the community of Bell Canyon looking northwest, directly adjacent to the Southern Undeveloped Area. Rock outcroppings, fencing and undeveloped land can be seen in the foreground. Because of the topography, only dirt service road, test stands and a blue hydrogen tank within Area II and the Southern Undeveloped Area are visible in the middleground and background from this location.

View 9 (Figure 4.1-4e) is from El Escorpion Park Ridge Trail looking northwest toward the Southern Undeveloped Area. Foreground views include chaparral vegetation along the trail. Middleground and background views include the Bell Canyon residential development on the valley floor and foothills. In the background, water tanks and a test stand are visible.

View 10 (Figure 4.1-4e) is from Roscoe-Valley Circle Park Ridge Trail looking northwest toward the eastern portion of the Southern Undeveloped Area and Area I. Foreground views include steep terrain and open space with chaparral vegetation along the trail; middle and background views include large bedrock outcroppings. The project site is not visible from this location, as the steep topography and large rock outcroppings screen views.

View 11 (Figure 4.1-4f) is from Simi Peak looking northeast toward the project site. The scenery from this location includes panoramic views of unobstructed open space areas. Foreground and middleground views comprise a variety of low-lying vegetation, including shrubs and grassy areas, and rolling hills with partially exposed bedrock surfaces. Distant views include higher elevation mountains and urban development in the far distance. The topography of the land screens views of the project site; therefore, the project site is not visible from this location.

Roadway Views

Roadway views from north-south and east-west oriented roadways would be limited to distant and partial views toward the project site, mainly or completely screened by topography and vegetation.

View 12 (Figure 4.1-4f) includes a motorist view from Tapo Canyon Road, located 0.5-mile south of SR 118, looking south toward the northern portion of the project site. This view includes the divided four-lane road along residential neighborhoods of Simi Valley throughout the foreground and middleground leading to undeveloped large mountains visible in the background, screening the project site; the project site is not visible from this location. View 12 is representative of similar views toward the project site from various locations along Topo Canyon Road, and other main north-south oriented roadways within Simi Valley. In addition, this location is representative of motorist views traveling east to west along SR 118, which is an Eligible State Scenic Highway that provides access through Simi Valley to the northern portion of the project site. Motorists may see short passing views of infrastructure at the project site in the distant horizon; however, the topography and screened views along SR 118 are consistent with those

shown in View 12.[1] In addition, the area between SR 118 and the project site is heavily developed with residential and commercial development, including utility lines along SR 118; therefore, any views of infrastructure on the project site would blend in with the surrounding built environment.

View 13 (Figure 4.1-4g) is from Maverick Lane, within the community of Bell Canyon, looking north towards the southern portion of the SSFL site. The roadway, residential fencing and vegetation can be seen in the foreground, while trees, vegetation and a steep hillside with rock outcroppings can be seen throughout the middleground and background. Due to the surrounding topography, views of the SSFL site are limited to test stands within Areas II and III can be seen in the distance along the ridgeline. This view is representative of views that motorists within the Bell Canyon community would experience.

In addition, the project site is partially or completely screened by topography along north-south oriented roads, such as Valley Circle Boulevard, east of the project site within the community of Canoga Park. Valley Circle Boulevard sits in the valley and the topography and existing built environment completely block views of the project site.

Residential Views

As described above, View 12 (Figure 4.1-4f) includes a motorist view from Tapo Canyon Road, looking south toward the northern portion of the project site. View 12 is also representative of views from residences within Simi Valley located north of the project because views from this area are generally partially or completely screened due to topography, vegetation, and built features in the area. This view includes the divided four-lane road along residential neighborhoods of Simi Valley and is representative of residential views throughout several Simi Valley neighborhoods. Large mountains are visible in the background, screening the project site.

Views 13 and 14 (Figure 4.1-4g) represent residential views from Bell Canyon adjacent to the western side of the Southern Undeveloped Area. As previously described, views of the SSFL site from View 13 are limited to test stands in the distance on the ridgeline of Areas II and III. View 14 is from North Corral Road in Bell Canyon, looking north toward the SSFL site. Views consist of largely undeveloped vegetated hillsides and rock outcrops; a dirt road or trail can be seen in the middleground on the left-hand side of the photograph. While it is possible that some residents could potentially experience longer views of the ridgelines along the project site from their homes, views of equipment and infrastructure on the ridgelines would generally be screened by existing topography and vegetation and would be limited to short periods of time.

Views from the Project Site

Views from the project site vary depending on the elevation of each project site area. However, View 15 (Figure 4.1-4h) is from a fire road adjacent to the western boundary of the site looking north (away from the SSFL site) toward Simi Valley, and is representative of most views from the project site. The photograph was taken from a high-elevation area, consistent with much of

[1] Because of safety hazards, stopping along SR 118 to take photographs was not feasible; however, several representative locations were considered and View 12 was chosen as the best representative viewpoint.

the topography along the boundary of the project site. Foreground views include partially developed open space land with trails and transmission lines, and middleground and background views consist of adjacent communities, roadways, and ridgelines in the distance.

4.1.2 Regulatory Setting

The project site is located in Ventura County. As described in Chapter 3.0, *Project Description*, of this PEIR, the lands adjoining the SSFL are owned and/or managed by a number of government agencies and private entities, including those in Ventura County and Los Angeles County. Private land includes properties owned by the American Jewish University's Brandeis-Bardin Campus residential developments, and other privately owned lands. Publicly owned open space lands include those managed by the Santa Monica Mountains Conservancy, which is a member of the Mountains Recreation and Conservation Authority. In addition, land owned by the federal government is under the jurisdiction and control of the Department of the Interior and includes the Santa Monica Mountains NRA, which is managed by NPS. The following discussion identifies the state and local regulations and policies relevant to the analysis of the proposed project's aesthetic impacts.

4.1.2.1 State Scenic Highway Program

The State Scenic Highway Program, created by the California Legislature in 1963, was established to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways. A highway is designated under this program when a local jurisdiction adopts a scenic-corridor protection program, applies to California Department of Transportation (Caltrans) for scenic highway approval, and receives notification from Caltrans that the highway has been designated as a scenic highway. An Eligible State Scenic Highway is a highway that has been defined as a scenic corridor (land generally adjacent to and visible to a motorist on the highway) by a city or county and nominated for official designation as a scenic highway. The status of a proposed State Scenic Highway changes from eligible to officially designated, when the local governing body applies to Caltrans for scenic highway approval, adopts a Corridor Protection Program, and receives notification that the highway has been officially designated a Scenic Highway.

The closest designated State Scenic Highways are SR 2 and SR 33; however, SR 2 is located in Los Angeles County more than 25 miles southeast of the site, and SR 33 is located in Ventura County more than 35 miles to the northwest of the site. The project site is not visible from either highway. According to the viewshed analysis, the project site could be potentially visible from places along SR 118, an Eligible State Scenic Highway, but not from US 101, which is also an Eligible State Scenic Highway.

4.1.2.2 Ventura County General Plan

The following goals and policies identified in the Ventura County General Plan would be applicable to the project.

Aesthetic Resources Goals

1.7.1-1: Preserve and protect the significant open views and visual resources of the County.

1.7.1-2: Protect the visual resources within the viewshed of lakes and State and County designated scenic highways, and other scenic areas as may be identified by an area plan.

1.7.1-3 Enhance and maintain the visual appearance of buildings and developments.

Aesthetic Resources Policies

1.7.2-4: The Planning Division shall continue to implement the landscaping requirements of the Zoning Ordinance and the "Guide to Landscape Plans" to enhance the appearance of discretionary development.

Ventura County has designated Scenic Resource Areas with specific scenic resource policies, which include the areas around Lake Sherwood, Lake Piru, Lake Casistas, and Matilija Lake, all of which are outside of the project viewshed.

The areas within 0.5 mile of adopted County or State Scenic Highways designated as Open Space, Agricultural, or Rural or the parcels that are contiguous to an adopted County or State Scenic Highway that are designated Urban, Existing, Community, or State and Federal Facilities are deemed Scenic Resource Areas (Ventura County, 2015). There are no Scenic Resource Areas within the viewshed of the project.

Roads eligible for Ventura County scenic resource status outside of the project viewshed but within 10 miles of the project include US 101, SR 23, N. Westlake Boulevard, Kanan Road, and Madera Road. SR 118 is eligible for Ventura County scenic status and is within the project viewshed.

4.1.2.3 City of Simi Valley General Plan

Goals, Policies, and Programs

The following goals and policies identified in the City of Simi Valley General Plan would be applicable to the project:

Goal NR-1: Natural Resource Conservation. Natural resources of importance to the City of Simi Valley and its Planning Area are conserved, enhanced, and protected.

Policy NR-1.1: Open Space Preservation and Buffer Zone. Protect, conserve, and maintain the open space, hillside, and canyon areas that provide a buffer zone around the City's urban form, serve as designated habitat for sensitive species, and provide recreation opportunities for residents and visitors.

Policy NR-1.11: Enhance and conserve the Arroyo Simi and its tributaries as a natural resource for scenic and passive recreational enjoyment by the community.

Goal NR-3: Visual Resource Protection. Significant visual resources are preserved as important quality-of-life amenities for residents and as assets for recreation and tourism.

Policy NR-3.1: Maintenance of Natural Topography. Preserve hills, ridgelines, canyons, bluffs, significant rock outcroppings, and open space areas surrounding the City as a visual resource, and locate buildings and utility infrastructure to minimize alteration of natural topography.

Policy NR-3.4: Collaboration with Local, State, and Federal Agencies. Coordinate with adjacent jurisdictions and state and federal agencies to protect designated scenic resources and corridors that, although beyond the City's land use authority, are important to the welfare of City residents.

4.1.3 Thresholds of Significance

For the purposes of this PEIR, DTSC has based the thresholds of significance on the checklist questions regarding aesthetic resources in Appendix G of the CEQA Guidelines. In addition, Ventura County's Initial Study Assessment Guidelines along with Los Angeles County standards have been incorporated, as appropriate, into the analysis.

Based on the size and scope of the project and the potential for aesthetic impacts, the following criteria are included for evaluation in this PEIR.

Would the project:

4.1-1 Have a substantial adverse effect on a scenic vista (refer to Impact Statements 4.1-1a and 4.1-1b)?

4.1-2 Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway (refer to Impact Statements 4.1-2a and 4.1-2b)?

4.1-3 Substantially degrade the existing visual or community character or quality of the site and its surroundings (refer to Impact Statements 4.1-3a and 4.1-3b)?

4.1-4 Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area (refer to Impact Statements 4.1-4a and 4.1-4b)?

4.1.4 Methodology

This analysis documents the visual setting and evaluates visual changes seen from public views associated with the overall site cleanup and initial activities as described in Chapter 3.0, *Project Description*, of this PEIR. To document the extent of potential project visibility, a computer-generated viewshed map was produced to show the general area from which the project is potentially visible, as described earlier under "SSFL Viewshed Map." Additionally, to convey a sense of existing visual conditions, the set of 14 photographs were taken to portray representative public views of the project site and the general visual character of the surrounding landscape. The existing view locations are shown in Figure 4.1-3. As depicted in these photographs, public views of the project site currently include views of existing buildings, equipment, and other infrastructure within the project site. These existing conditions constitute the baseline from which

visual impacts are evaluated. Visual simulations of the project were also prepared to provide a comparison of existing conditions and post-remediation conditions. The analysis of aesthetic impacts is based in part on the evaluation of visual simulations showing existing and future conditions from Key Observation Points (KOPs) in the vicinity of the project site (see Section 4.1.5 for more information). KOPs and visual simulations are described below and in the following pages.

4.1.4.1 Visual Character

As described earlier in Section 4.1.1.5, public lands adjacent to the project site would include the most unobstructed views of the project site, specifically those within Sage Ranch Park, as a portion or the entire project site can be seen from the Sage Ranch Loop Trail. Roadway views from north-south and east-west oriented roadways such as SR 118, Valley Circle Boulevard, and Tapo Canyon Road would be limited to distant and partial views toward the project site, which are partially or completely screened by topography and vegetation. In addition, residential views, including those from Bell Canyon and Canoga Park, are limited to partial views of existing equipment and infrastructure on ridgelines.

Existing visual character of the project site and vicinity is compared to the expected appearance of the project site with implementation of overall site cleanup and initial activities that can be seen by members of the public. The visual character of the project site and/or surrounding area would be substantially degraded if: (1) implementation of the proposed project results in the loss of aesthetic features; or (2) implementation of the proposed project would introduce contrasting features that would degrade the visual quality and/or character of the project site or the surrounding area. As previously mentioned, the analysis of visual character is based in part on visual simulations depicting the project site under existing and future conditions. For purposes of this analysis, "substantially alter the existing visual quality or character" is defined as circumstances in which project implementation would introduce permanent dominant visual elements that, based on the landscape sensitivity level, would result in noticeable to very noticeable changes that do not blend and are not in keeping or are incompatible with the existing visual environment that could be viewed by sensitive viewers (e.g., recreational visitors, motorists, and residents) from public viewing areas.

4.1.4.2 Selection of Key Observation Points

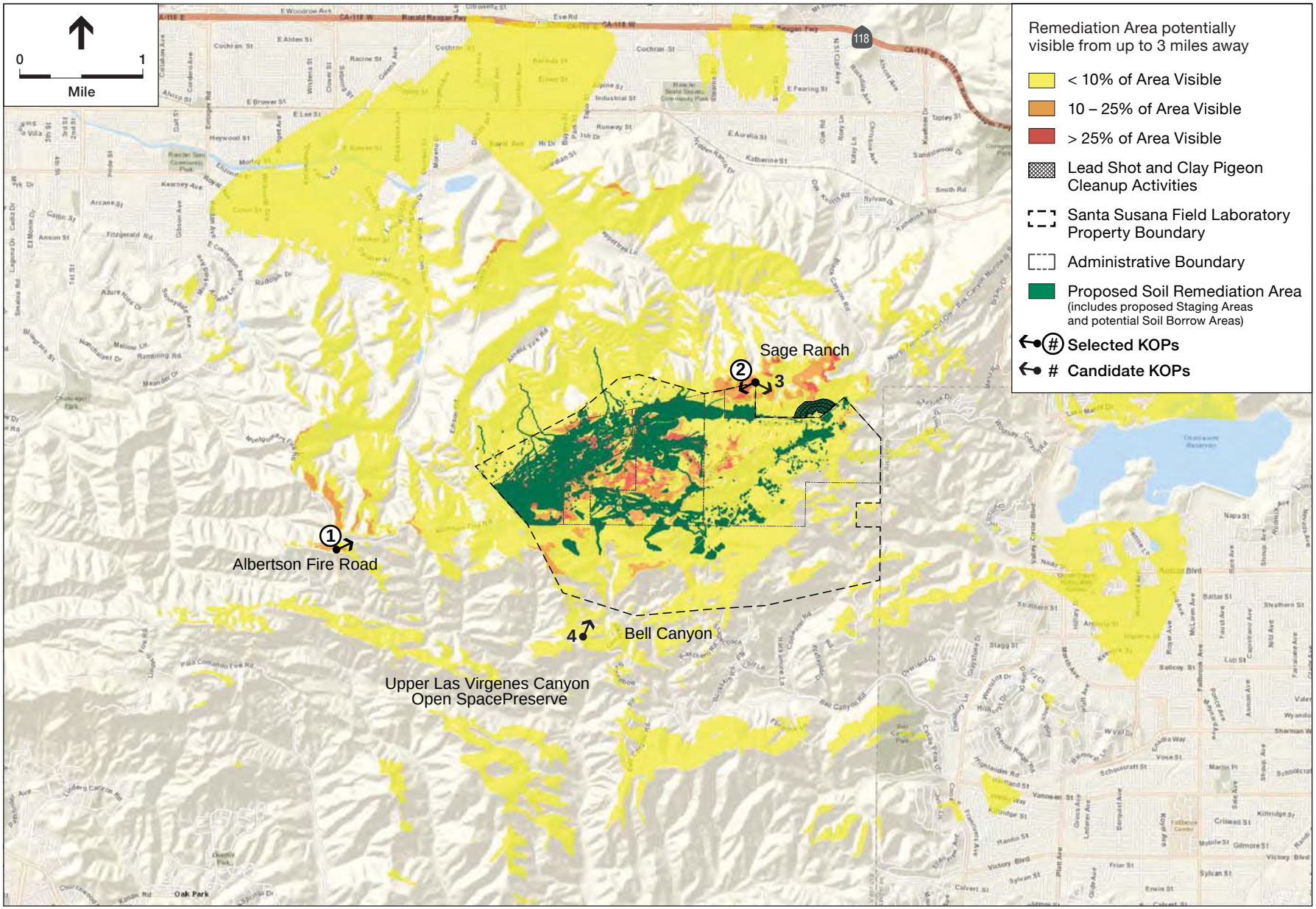
The analysis of impacts is based in part on the evaluation of visual simulations depicting existing and future conditions from KOPs within the project site and vicinity. KOPs are defined as one or a series of points on a travel route or at a use area or a potential use area where the view of an activity would be most revealing. The intent of establishing KOPs is to visualize the contrast created by the proposed project from locations most representative of how the public perceives the affected landscape. The "public" may include highway travelers, travelers on local roads, residents in surrounding private lands, or recreational visitors on public lands surrounding the project site. The sensitivity of these diverse user groups to changes in the landscape are influenced by a number of factors, including how prominent the view of the proposed project is (in terms of scale, distance, and angle of observation), the frequency and duration that viewers are

exposed to the view, and whether the viewer groups are aware of their surroundings or expectant of high-quality views, as described earlier in Section 4.1.1.4.

Field observations were conducted in February 2015 to document existing visual conditions at and around the project site. KOPs were chosen with an emphasis on views of the project site from public vantage points that are experienced by different user groups, or sensitive viewers, and are discussed further in Section 4.1.5. Each KOP appropriately reflects the impact that implementation of the proposed project would have on potential sensitive viewers, including motorists, recreational visitors, and residents.

KOPs were identified based on review of available land use data, preliminary viewshed analysis, a review of aerial maps, and results from site visits. To represent views that would be experienced by sensitive viewers, candidate KOPs were selected based on the following criteria: (1) identification and photo-documentation of viewing areas and potential KOPs; (2) classification of visual sensitivity of KOPs; and (3) an evaluation of the future project visibility from KOPs. Four candidate KOPs were considered, as shown in **Figure 4.1-5**. Of the four candidate KOPs, two were eliminated (candidate KOPs 3 and 4) and two were selected (KOPs 1and 2,) for visual simulations. Based on field site visits and existing photographs, views from KOPs 3 and 4 were determined to be limited or completely screened as a result of existing vegetation, topography, and features within the built environment, as described in the Section 4.1.1.5, *Visual Character and Representative Views of Project Site* section (see Figures 4.1-4e through 4.1-4g). The KOPs that were selected for visual simulation were chosen to represent views from which sensitive viewers are most likely to view the project site; these are limited to views recreational visitors would experience during implementation of the project. The KOPs that were selected for visual simulations are described below.

KOP 1 (**Figure 4.1-6a**) is an existing viewpoint from Albertson Fire Road looking northeast toward the project site. Foreground views include low-lying vegetation and the fire road. Middleground views include open grass areas and low-lying chaparral vegetation among rolling hills and rock outcroppings, as well as dirt roads and trails. Buildings and infrastructure at the project site are visible in the middleground and are somewhat dominant from this KOP. Panoramic views of mountains can be seen in the background from this viewpoint.



SOURCE: Environmental Vision; ESRI

Santa Susana Field Laboratory . 120894

Figure 4.1-5
KOP Locations

SOURCE: Environmental Vision

Santa Susana Field Laboratory . 120894

Figure 4.1-6a
KOP1: Existing View From
Albertson Fire Road Looking
Northeast Toward the SSFL Site

Santa Susana Field Laboratory . 120894

SOURCE: Environmental Vision

Figure 4.1-6b
KOP1: Visual Simulation of the Proposed Project From
Albertson Fire Road Looking Northeast
Toward the SSFL Site

KOP 2 (**Figure 4.1-7a**) is an existing viewpoint from a rock outcropping within Sage Ranch Park (adjacent to the Sage Ranch Loop Trail) looking southwest toward the project site. A steep flat rock is a predominant feature in the foreground of this KOP and other outcroppings, mountains and varied landforms are visible throughout middleground and background views. The northern portions of Area I and Area II can be seen from this KOP and are a dominant feature within the middleground comprising leveled topography with hardscaped areas, buildings, and roads from this KOP. In general, oak trees and low-lying vegetation comprised of chaparral scrub and grass is mixed within the rock outcroppings throughout the viewpoint.

The significance determination for the visual analysis is based on consideration of the following: (1) the extent of visual change related to the level of visibility from KOPs; (2) the degree of visual contrast and compatibility in scale and character between project elements and the existing surroundings; and (3) project conformance with public policies regarding visual and urban design quality.

4.1.4.3 Visual Simulation Preparation

Visual simulations of the proposed project from the selected KOPs were prepared to provide a comparison of existing and post-remediation conditions (after the site would be fully restored), as well as context for qualitative description of the aesthetic changes that would result from the project (Figure 4.1-6b and **Figure 4.1-7b**). Existing viewpoint photographs were taken during a site visit in February 2015.The visual simulations produced by Environmental Vision are the results of a systematic digital photography and computer modeling process. The technical methods employed for producing the computer-generated simulation images are outlined below.

High resolution digital photographs were taken from key viewpoints using a single-lens reflex (SLR) camera with a 50 millimeter (mm) lens which represents a horizontal view angle of 40 degrees. Systematic documentation of photography viewpoint locations included Global Positioning System (GPS) recording and photograph log sheet and basemap annotation.

Three–dimensional (3-D) computer modeling for the proposed soil cleanup areas was developed from geographic information system (GIS) data for the project compiled from Boeing, DOE, and NASA data (see Figure 3-5). Other technical assumptions for project information such as potential excavation depths, grading, and site reclamation were developed in consultation with the project team and DTSC. The digital project modeling was combined with existing conditions data such as GIS topographic data, and digital aerial photographs of the site and surrounding area including viewpoint locations, to produce digital modeling for simulation of the proposed project.

For the simulation viewpoints, photograph locations were incorporated into the 3-D modeling based on GPS field data and basemap, using 5 feet as the assumed eye level. Computer "wireframe" perspective plots were overlaid on the photographs to verify scale and viewpoint locations. Digital visual simulation images were then produced using the 3-D modeling combined with digital photographs from each viewpoint. The visual simulations portray the project site approximately 5 to 10 years after completion of the proposed remediation and revegetation.

SOURCE: Environmental Vision

Santa Susana Field Laboratory . 120894

Figure 4.1-7a

KOP2: Existing View From Sage Ranch Park Rock Outcropping Looking Southwest Toward Areas I and II

Santa Susana Field Laboratory . 120894

SOURCE: Environmental Vision

Figure 4.1-7b

KOP2: Visual Simulation of the Proposed Project from Sage Ranch Park Rock Outcropping Looking Southwest Toward Areas I and II

4.1.4.4 Rating Visual Quality

While there are a number of standardized methods for rating visual quality, this analysis uses a methodology based on the U.S. Bureau of Land Management's (BLM's) "Scenic Quality Rating Criteria" to analyze potential impacts to scenic values. The BLM Visual Resource Management (VRM) approach was chosen because although the project site is not located on BLM land, the SSFL property is partially owned by the federal government (under the administrative jurisdiction of NASA). Assessing scenic values and determining visual impacts can be a subjective process. Objectivity and consistency can be greatly increased by evaluating the basic components of the landscape, which are described below and on the following page. This process involves rating the visual appeal of a tract of land, measuring public concern for scenic quality, and determining whether the tract of land is visible from KOPs (BLM, 1986). The BLM VRM approach allows the various landscape elements that comprise visual quality to be quantified and rated with a minimum of ambiguity or subjectivity such that it can be easily understood and compared by the reader.

According to this method, visual quality is rated according to the presence and characteristics of seven key components of the landscape. These components include landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications.

1. The ***landform*** component of the visual quality rating criteria takes into account the fact that topography becomes more interesting visually as it gets steeper or more massive, or more severely or universally sculptured. Outstanding landforms may be monumental (as found in Yosemite Valley), or they may be exceedingly artistic and subtle (such as certain ridgelines, pinnacles, peaks, and other extraordinary formations).
2. The ***vegetation*** component of the rating criteria gives primary consideration to the variety of patterns, forms, and textures created by plant life. Short-lived displays are given consideration when they are known to be recurring or spectacular. Consideration also is given to smaller-scale vegetation features that add striking and intriguing detail elements to the landscape (e.g., hedgerows or trees, native grasses).
3. The ***water*** component of the rating criteria recognizes that visual quality is largely tied to the presence of water in scenery, as it is that ingredient which adds movement or serenity to a scene. The degree to which water dominates the scene is the primary consideration in selecting the rating score for the water component.
4. The ***color*** component of the visual quality rating criteria considers the overall color(s) of the basic components of the landscape (e.g., soil, rock, vegetation). Key factors that are used when rating the color of scenery are variety, contrast, and harmony.
5. The ***adjacent scenery*** component of the rating criteria takes into account the degree to which scenery outside the view being rated enhances the overall impression of the scenery under evaluation evaluated. The distance of influence for adjacent scenery normally ranges from 0 to 5 miles, depending upon the characteristics of the topography, the vegetation cover, and other such factors. This factor generally is applied to views that normally would rate very low in score, but the influence of the adjacent high visual quality would enhance the visual quality and raise the score.
6. The ***scarcity*** component of the visual quality rating criteria provides an opportunity to give added importance to one or all of the scenic features that appear to be relatively unique or rare within a region. There may also be cases where a separate evaluation of each of the

key factors does not give a true picture of the overall scenic quality of an area. Often, it is a number of not so spectacular elements in the proper combination that produces the most pleasing and memorable scenery—the scarcity factor can be used to recognize this type of area and give it the added emphasis it should have.

7. The ***cultural modifications*** component of the visual quality rating criteria takes into account any man-made modifications to the landform, water, vegetation, and/or the addition of man-made facilities. Depending on their character, these cultural modifications may detract from the scenery in the form of a negative intrusion or they may complement and improve the scenic quality of a view.

Based on the above criteria, views are rated numerically and a total score of visual quality can be tabulated. Based on the rating system described above, there are a total of 32 points possible. Views that score a total of 19 points or more are typically considered very high in visual quality. Views that score a total of 15 to 18 points typically are considered to have a high level of visual quality. Views that score a total of 12 to 15 points typically are considered to have an above-average level of visual quality. Finally, views that score a total of 11 points or fewer are typically considered to have average or lower visual quality. For the purposes of this CEQA analysis, the visual quality categories that correlate to these score ranges differ from the BLM scenic quality classifications established in BLM Manual H-8410-1 *Visual Resources Inventory.* The score ranges/categories presented in this analysis provide a broader and more descriptive range of categories that more adequately characterize before and after project conditions. **Table 4.1-1** summarizes the point values associated with the various criteria.

An important premise of this evaluation method is that views with the most variety and most harmonious composition have the greatest scenic value. Another important concept is that man-made features within a landscape do not necessarily detract from the scenic value. In fact, certain man-made features that complement the natural landscape may actually enhance the visual quality. In making this determination, it is therefore important to assess project effects relative to the visual character of the project setting. Visual character is qualitatively defined by four primary components: form, line, color, and texture.

Projects that create a high level of contrast to the existing visual character of a project setting are more likely to generate adverse visual impacts due to visual incompatibility. Conversely, projects that create a low level of contrast to the existing visual character are less likely to generate adverse visual impacts due to inherent visual compatibility. On this basis, project modifications are quantified and evaluated for impact assessment purposes.

By comparing the difference in visual quality ratings from the baseline (“before”) to post-project (“after”) visual conditions, the severity of project-related visual impacts can be quantified. However, in some cases visual changes caused by projects may actually enhance the scenic quality of an area.

TABLE 4.1-1
VISUAL QUALITY RATING SYSTEM

Key Factors	Rating Criteria and Score							
Landform	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops, or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers.		Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features which are interesting though not dominant or exceptional.		Low rolling hills, foothills, or flat valley bottoms; or few or no interesting landscape features.			
	Score	**5**	**Score**	**3**	**Score**	**1**	**Total**	
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns.		Some variety of vegetation, but only one or two major types.		Little or no variety or contrast in vegetation.			
	Score	**5**	**Score**	**3**	**Score**	**1**	**Total**	
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape.		Flowing, or still, but not dominant in the landscape.		Absent, or present but not noticeable.			
	Score	**5**	**Score**	**3**	**Score**	**1**	**Total**	
Color	Rich color combinations, variety, or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snow fields.		Some intensity or variety in colors and contrast of the soil, rock, and vegetation, but not a dominant scenic element.		Subtle color variations, contrast, or interest; generally mute tones.			
	Score	**5**	**Score**	**3**	**Score**	**1**	**Total**	
Influence of Adjacent Scenery	Adjacent scenery greatly enhances visual quality.		Adjacent scenery moderately enhances overall visual quality.		Adjacent scenery has little or no influence on overall visual quality.			
	Score	**5**	**Score**	**3**	**Score**	**1**	**Total**	
Scarcity	One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc.		Distinctive, though somewhat similar to others within the region.		Interesting within its setting but fairly common within the region.			
	Score	**5**	**Score**	**3**	**Score**	**1**	**Total**	
Cultural Modifications	Modifications add favorably to visual variety while promoting visual harmony.		Modifications add little or no visual variety to the area, and introducing no discordant elements.		Modifications add variety but are very discordant and promote strong disharmony.			
	Score	**2**	**Score**	**0**	**Score**	**-4**	**Total**	

Total Score for All Categories: _____

The following designations are used to rank the significance of project impacts according to the pre- and post-project differences in numerical visual quality scores:

- **Significant and unavoidable impact:** Any impact that could lower the visual quality of an identified sensitive viewpoint by four points or more, and for which no feasible or effective mitigation can be identified.
- **Less-than-significant with mitigation incorporated:** Any impact that could lower the visual quality of an identified sensitive viewpoint by two points or more, but can be reduced to less than two points with mitigation incorporated. Therefore, specific mitigation measures are provided to reduce the impact to a less-than-significant level.
- **Less-than-significant impact:** Any impact that could lower the visual quality of an identified sensitive viewpoint by one point or less. In visual impact analysis, a less-than-significant impact usually occurs when a project's visual modifications can be seen but do not dominate, contrast with, or strongly degrade a sensitive viewpoint.
- **No impact:** The project would not have an impact from the KOP. In visual impact analysis, there is no impact if the project's potential visual modifications cannot be seen from an identified sensitive viewpoint.

However, in some cases, visual changes caused by projects may enhance the scenic quality of the project site or surrounding area.

4.1.4.5 Scenic Vistas

For purposes of this evaluation, a scenic vista is defined as a distant public view along or through an opening or corridor that is recognized and valued for its scenic quality. A significant impact on a scenic vista is defined as circumstances in which remediation or operational activities would introduce permanent dominant visual elements that, based on the landscape sensitivity level, would result in noticeable to very noticeable changes in the visual character of a vista viewshed that do not blend and are not in keeping or are incompatible with the existing visual environment. These changes can be viewed by sensitive viewers from public viewing areas. According to the Ventura County General Plan, there are no scenic vistas within or directly adjacent to the project site.

A substantial adverse effect on a scenic vista is defined as circumstances in which remediation or operational activities would introduce permanent dominant visual elements that, based on the landscape sensitivity level, would result in noticeable to very noticeable changes in the visual character of a scenic vista viewshed that would be visually obtrusive or incompatible with the existing visual environment. These changes can be viewed by sensitive viewers (e.g., recreational visitors, motorists, or residents) from public viewing areas.

4.1.5 Analysis of Project Impacts

The following text describes the potential environmental impacts related to aesthetics associated with implementing the overall site cleanup and initial activities, demarcated as impact "a" and "b," respectively. The initial activities are presented in Section 3.7, *Initial Activities*, of this PEIR. Depending on the degree to which impacts of the initial projects would be similar to or different

from each other, the impact analysis for the initial projects for some thresholds has been combined accordingly (i.e., the number of separate discussion for impact for each threshold ranges from one to nine). Each impact discussion concludes with a significance determination.

4.1.5.1 Scenic Vistas

Program Assessment

Impact 4.1-1a: Would implementation of the overall site cleanup have a substantial adverse effect on a scenic vista?

Overall Site Cleanup (Impact 4.1-1a)

Although there are no designated scenic vistas within the project site, Sage Ranch Loop Trail is considered a scenic vista for the purpose of this analysis, because it is a focal point for recreational visitors and is within proximity to Area I (Figure 4.1-1). Views from the loop trail and adjacent rock outcroppings are potentially of comparatively long duration as a result of access to multiple vantage points and unobstructed vistas of surrounding scenery. Views of the project site, including views of infrastructure and buildings, are generally partially or fully visible from several viewpoints within Sage Ranch Park. Specifically, KOP 2 provides the most prominent views of the project site, as depicted in Figure 4.1-7a, which shows the existing view from the Sage Ranch rock outcropping, including the northern part of NASA's portion of Area I, the northern part of Area II, most of Area III, and most of Area IV and the Northern Undeveloped Area.

Earth-moving activities, stockpiled soils, remediation materials, equipment, and vehicles may be visible on the project site during cleanup activities, including removal of buildings; this would impact viewers such as recreational visitors to the north of the project site within Sage Ranch Park (KOP 2) and on trails and peaks to the southwest, as represented along Albertson Fire Road (KOP 1). Site cleanup activities, including soil excavation and disposal activities, and site restoration are anticipated to be ongoing for up to 15 years; associated visual impacts would occur throughout the entire remediation period. Minor impacts associated with ongoing groundwater remediation and associated monitoring would be ongoing for longer, but impacts would be minimal. Much of the existing project site is hardscape and contains several facilities, equipment, and vehicles; therefore, the introduction of remediation equipment and materials to complete cleanup activities would not substantially degrade visual quality of the area from Sage Ranch Loop Trail or other trails surrounding the project site. The project would result in removal of some medium to large boulders along the rock outcroppings throughout the site, such as those shown on Figures 4.1-7a and 4.1-7b (KOP 2). However, Mitigation Measure BIO-5 requires that large boulders removed during cleanup be replaced in a similar layout as existing conditions to retain the natural character of the area.

In addition, lead shot and clay pigeon debris would be removed from the former Rocketdyne-Atomics International Rifle and Pistol Club Trap and Skeet shooting range area, located northwest of Area I within Sage Ranch Park, as described in Sections 3.3.5, *Lead Shot and Clay Pigeon Cleanup Activities*, and 3.6.2, *Lead Shot and Clay Pigeon Cleanup Activities*. Visible lead shot would be removed by either manual means (shovels, hand rakes, screens/sifters) or by using

backpack-mounted or truck-mounted vacuums. In some locations, soil excavation may also be warranted; although no specific excavation areas have been identified at this time. Recreational users of the park would have 100 percent visibility of these activities and would experience temporary visual impacts related to these activities over the course of 2 years from presence of cleanup equipment, personnel, and potential trail access restrictions. However, following cleanup actions, best management practices (BMPs) would be installed for erosion control (straw waddles, silt fencing, etc.) and the site would be restored to the extent practical. In addition, as discussed in Chapter 3.0, *Project Description*, of this PEIR (Section 3.6.1.1), should excavation occur in this area, 30 to 75 percent of the soil volume excavated would be replaced with backfill and the excavated areas would be contoured to mimic natural topography. Also, excavated areas would be revegetated with native plant species pursuant to Mitigation Measure BIO-5 (see Section 4.3.6). Therefore, cleanup activities in the lead shot cleanup area would not have a substantial visual effect on this portion of Sage Ranch Park.

Visual impacts from cleanup activities may also include the generation of dust, which could cause visual impacts; however, as described in Section 3.6.1.1, *Excavation and Offsite Disposal*, of this PEIR, dust control measures (specifically, Mitigation Measures AQ-2, AQ-3, and AQ-5, presented in Section 4.2, *Air Quality*, of this PEIR) would be implemented, in accordance with regulatory guidelines, for its respective areas to reduce and control the generation of dust from excavation activities and soil stockpiles.

Haul routes for the project include Facility Road, which is located on the project site, and the following public roads: Woolsey Canyon Road, Topanga Canyon Boulevard, Roscoe Boulevard, and Valley Circle Boulevard, Lake Manor Drive, and Plummer Street, as depicted on Figure 3-7. Affected viewers along haul routes typically include recreational visitors, motorists, and residents exposed to views of construction traffic along haul routes or from KOPs. Specifically, recreational visitors on the Sage Ranch Loop Trail (KOP 2) would experience visual impacts related to increased construction traffic along Service Area Road, which is located approximately one-half mile from the trail and connects to Facility Road, during transportation of excavated materials to local disposal sites. As described in Section 4.11, *Transportation and Traffic*, of this PEIR, daily truck trips would be spread evenly over 8 hours within a single 11-hour shift for a maximum of about 12 trucks an hour on haul routes, including Facility Road. However, haul and disposal activities would not substantially degrade views from the Sage Ranch Loop Trail, as they would be brief in duration when vehicles transporting materials pass by viewers. In addition, recreational visitors to Sage Ranch Park typically travel by foot and are not stationary, which would further reduce the time they would be exposed to views of trucks along haul routes. For further information regarding impacts associated with traffic, refer to Section 4.11, *Transportation and Traffic*, of this PEIR.

Overall, impacts to visual resources from implementation of cleanup activities would occur to viewers, including recreational visitors, residents, and motorists. However, these impacts would not substantially degrade the visual character of the existing previously disturbed and developed project site, or views of a scenic vista.

As shown in the visual simulations (Figures 4.1-6a through 4.1-7b), portions of the project site would be revegetated following implementation of cleanup activities and the visual character of the area would be increased.

> Conclusion: With implementation of Mitigation Measures AQ-2, AQ-3, AQ-5 and BIO-5, overall site cleanup would not substantially degrade the existing previously disturbed and developed visual character of the project site, or views of a scenic vista. In addition, once completed, implementation of the overall site cleanup would generally increase the quality of the visual character at the project site and surrounding area from all KOPs. Therefore, impacts would be less than significant with mitigation.

Impact 4.1-1a Determination: *With implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5,* ***overall site cleanup*** *would not substantially degrade existing views of a scenic vista. In addition, once completed, implementation of the overall site cleanup would generally increase the quality of the visual character at the project site and surrounding area from all KOPs. Therefore, impacts would be* ***less than significant.***

Initial Project Assessment

Impact 4.1-1b: Would implementation of the **initial activities** have a substantial adverse effect on a scenic vista?

DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal (Impact 4.1-1b)

As described in Section 3.7.1, *DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal*, DOE's initial activities would include excavation, disposal, and backfilling/restoration. Activities are anticipated to commence after approval of the PEIR, and the estimated duration of activities is 3 to 5 years.

DOE's initial project would be located approximately 1 mile west of Sage Ranch Loop Trail (see Figure 4.1-1) and could be partially visible from the trail. Visual impacts from Sage Ranch Park, particularly the Sage Ranch Loop Trail, would be the same as those described for the overall project and include earth-moving activities; the introduction of stockpiled soils, remediation materials, equipment, etc.; and visual impacts related to dust. However, with implementation of Mitigation Measures AQ-2, AQ-3, AQ-5 (which would reduce project-generated dust), and BIO-5 (which would require revegetation of excavated areas), impacts would be less than significant.

> Conclusion: With implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5, impacts associated with DOE's initial project would not substantially degrade existing views of a scenic vista. Therefore, this impact would be less than significant with mitigation.

NASA Liquid Oxygen Plant (Impact 4.1-1b)

As described in Section 3.7.2, *NASA Liquid Oxygen Plant,* of this PEIR, this project would include excavation and disposal of soil from the Liquid Oxygen Plant area where contaminants exceed established LUT values. NASA's initial project area is located in the northern part of Area I, as shown in Figure 3-12. Cleanup activities would include excavation and offsite disposal of soil, as well as backfilling and restoration. Prior to excavation, NASA would conduct site preparation activities, including vegetation removal, staking, equipment staging, and surveying for potential subgrade utilities or other buried infrastructure within the excavation areas. Activities are anticipated to commence after approval of the PEIR and the estimated duration of activities is approximately 15 months.

The western-most portion of the Sage Ranch Loop Trail is located adjacent to Area I and NASA's initial project area (Figure 4.1-4b). Therefore, the NASA initial project area would be visible from the Sage Ranch Loop Trail. All structures that once existed at this site have previously been demolished and removed. The site is generally flat and contains weeds due to previous disturbance (Figure 4.1-4b). After excavation, views would generally remain consistent with existing visual conditions. However, grading the area to mimic natural contours and revegetation (Mitigation Measure BIO-5) could improve the visual quality of the area. Visual impacts to Sage Ranch Park, particularly the Sage Ranch Loop Trail, would be associated with the staging and operation of project-related construction equipment and generation of dust, as described previously under Impact 4.1-1a. However, with implementation of Mitigation Measures AQ-2, AQ-3, AQ-5 (which would reduce project-generated dust), and BIO-5 (which would require revegetation of excavated areas), impacts would be less than significant.

> Conclusion: With the implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5, NASA's initial project would not substantially degrade the existing views of a scenic vista. Therefore, impacts would be less than significant with mitigation.

Demolition Activities (Impact 4.1-1b)

DOE demolition activities throughout Area IV would include building demolition, soil excavation, transportation, and disposal, as well as revegetation, as needed. Building debris would be staged in the immediate vicinity of the individual demolition being conducted on intact concrete and/or on top of a plastic liner for onsite sorting and characterization for disposal. Demolition activities are anticipated to commence after approval of the PEIR and are expected to last approximately 1 to 2 years.

Demolition activities may be partially visible from Sage Ranch Loop Trail (as depicted in KOPs 2 and 3), creating temporary visual impacts to the scenic vista associated with staging and operation of equipment and debris, earth-moving activities, dust generation, material sorting and characterization, and material transportation for disposal. However, with implementation of Mitigation Measures AQ-2, AQ-3, AQ-5 (which would reduce project-generated dust), and BIO-5 (which would require revegetation of excavated areas), impacts would be less than significant. In addition, activities would occur within a previously disturbed built environment,

would be temporary (up to 2 years), and would be similar to those previously described for the other initial activities.

> Conclusion: With implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5, impacts associated with DOE Area IV demolition activities would not substantially degrade existing views of a scenic vista. Therefore, impacts associated with the demolition activities would be less than significant with mitigation.

RCRA Post-Closure-and Hazardous Waste Facility Closure (Impact 4.1-1b)

This discussion addresses the five closure projects described in Section 3.7.4, *RCRA Post-Closure and Hazardous Waste Facility Closure*, of this PEIR:

- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

As described in Section 3.7.4, *RCRA Post-Closure, and Hazardous Waste Facility Closure*, DTSC would evaluate the renewal of two post-closure permits and regulate the closure of three former hazardous waste facilities, all of which are currently non-operational, under the RCRA Hazardous Waste Facility Permitting Program.

Closure of the TTF, RMHF, and HWMF would include excavation and disposal of the soils and building debris that were contaminated by operations, followed by confirmation sampling and restoration. Closure activities would commence after approval of the PEIR and would last approximately 1 year.

Visibility of RCRA closure activities from Sage Ranch Park would be generally limited to those associated with historical surface impoundments in Area II and III (Figure 3-10). Activities within Area IV and the southern portion of Area I may also be partially seen from Sage Ranch Park. Visual impacts associated with closure of the TTF, RMHF, the HWMF and historical surface impoundments would be similar to those previously described for other initial projects; impacts would include the presence of staging and operation of remediation equipment and generation of dust. However, with implementation of Mitigation Measures AQ-2, AQ-3, AQ-5 (which would reduce project-generated dust), and BIO-5 (which would require revegetation of excavated areas), impacts would be less than significant.

> Conclusion: With implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5, impacts associated with closure of the TTF, RMHF, and HWMF would not substantially degrade existing views of a scenic vista. Therefore, impacts would be less than significant with mitigation.

Areas I, II, and III Impoundment Post-Closure (Impact 4.1-1b)

As described in Sections 3.7.4.4, *Area I/III Impoundment Post-Closure*, and 3.7.4.5, *Area II Impoundment Post-Closure*, activities associated with the NASA and Boeing impoundment permits are limited to managing impoundments through monitoring and periodic maintenance.

No earth-moving activities would be required; impacts would be limited to the presence of workers and equipment during monitoring and maintenance. The presence of up to three workers and light trucks during monitoring and maintenance activities at the impoundments would not substantially degrade a scenic vista.

> Conclusion: Impacts associated with NASA and Boeing impoundment permits would not substantially degrade existing views of a scenic vista. Therefore, impacts would be less than significant.

Impact 4.1-1b Determination: *With implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5, the* ***initial activities*** *would not substantially degrade existing views of a scenic vista. In addition, once completed, implementation of the initial activities would generally increase the quality of the visual character at the project site and surrounding area from all KOPs. Therefore, impacts would be* ***less than significant with mitigation****.*

4.1.5.2 Scenic Resources within a State Scenic Highway

Program Assessment

Impact 4.1-2a: Would implementation of the **overall site cleanup** substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Overall Site Cleanup (Impact 4.1-2a)

As discussed in Section 4.1.2.1, the project site is not located within the view a state scenic highway and would not be visible from a designated State Scenic Highway; however, SR 118 is an Eligible State Scenic Highway. As described in Section 4.1.1, motorist views from SR 118 are typically brief in duration, while in many instances views are completely screened by intervening topography and vegetation. As discussed previously for Impact 4.1-1a, impacts to visual resources from implementation of overall site cleanup would not substantially degrade the visual character of the existing previously disturbed and developed project site, or views of a scenic vista. The overall site cleanup would result in removal of some medium to large boulders along the rock outcroppings throughout the site, such as those shown on Figures 4.1-7a and 4.1-7b (KOP 2). However, Mitigation Measure BIO-5 requires that large boulders removed during cleanup be replaced in a similar layout as existing conditions to retain the natural character of the area. Cleanup of the project site is not expected to result in substantial damage to scenic resources within views of a State Scenic Highway. Based on the generalized viewshed map analysis (Figure 4.1-2), up to 10 percent of the project site could be observable by motorists traveling along SR 118. However, as previously described, the viewshed map considers only topographic screening

and thus, in this respect, presents a conservative assessment of project visibility because, in most instances, views of the project are screened by existing vegetation and facilities in the built environment as well as the topography. In addition, while the map shows the generalized pattern of project visibility, it does not distinguish how much of the activity in question may be visible from a given location within the viewshed. As noted from the field site visit, roadway views of the project site are typically brief in duration, while in most instances views are partially or completely screened by built elements, intervening topography, and vegetation (as demonstrated in Figure 4.1-4f, which shows representative View 12 for SR 118).[2] Further, SR 118 is located over 2 miles away from the project site and, when combined with all the factors described above, impacts to SR 118 would be less than significant.

Conclusion: Implementation of the overall site cleanup would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. Impacts would be less than significant.

Impact 4.1-2a Determination: *Implementation of the* ***overall site cleanup*** *would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. Impacts would be* ***less than significant****.*

Initial Project Assessment

Impact 4.1-2b: Would implementation of the **initial activities** substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

As discussed in Section 3.7, *Initial Activities*, of the PEIR, the RPs would implement the following projects and activities as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities (not part of the project, but a described activity)
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

[2] As described in the *Views Toward the Project* discussion in Section 4.1.1, View 12 is representative of similar views toward the project site SR 118. Motorists may see short passing views of infrastructure at the project site in the distant horizon; however, the topography and screened views along SR 118 are consistent with those shown in View 12.

As described under the analysis of Impact 4.1-2a for the overall site cleanup, views of the project site and initial activities from SR 118 are distant (2 miles); mostly screened by vegetation, the built environment, and topography; and are brief in duration. As discussed previously for Impact 4.2-1a, impacts to visual resources from implementation of cleanup activities would not substantially degrade the visual character of the existing previously disturbed and developed project site, or views of a scenic vista. Furthermore, implementation of the initial activities, which include excavation and disposal of contaminated soils, demolition of existing buildings, and maintenance of retention ponds, would not result in substantial damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway; impacts would be less than significant.

> Conclusion: The initial activities would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway; impacts would be less than significant.

Impact 4.1-2b Determination: *The* ***initial activities*** *are not located within a State Scenic Highway and would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway or observable from a state scenic highway; impacts would be* ***less than significant****.*

4.1.5.3 Visual or Community Character

As described in Section 4.1.3.3, the generalized viewshed map (Figure 4.1-2) indicates that limited portions of the project site would potentially be visible to the public from the majority of the surrounding publicly accessible areas. However, the viewshed map considers only topographic screening and, in this respect, it presents a conservative assessment of project visibility because, in most instances, views of the project are screened by existing vegetation and facilities in the built environment, as well as the topography. In addition, while the map shows the generalized pattern of project visibility, it does not distinguish how much of the activity in question may be visible from a given location within the viewshed. Moreover, project activities that the viewshed map indicates as being potentially visible may not be perceptible to a casual observer, especially when considering more distant views.

As previously described, 14 photographs depicting representative views of the project site (Figures 4.1-4a through 4.1-4h), as well the KOPs depicting existing conditions and visual simulations of project elements (Figures 4.1-6a through 4.1-7b) were developed to illustrate the potential effects of project-related changes on visual resources.

Program Assessment

Impact 4.1-3a: Would the **overall site cleanup** substantially degrade the existing visual or community character or quality of the site and its surroundings?

Overall Site Cleanup (Impact 4.1-3a)

As described under Impact 4.1-1a, visual resources impacts associated with implementation of cleanup activities would occur to sensitive viewers. Visual simulations illustrate potential visual effects of project-related changes on KOPs (Figures 4.1-6b through 4.1-7b). As previously described for Impact 4.1-1 and Impact 4.1-2, visual impacts associated with remediation would include the presence of staging and operation of remediation equipment and generation of dust. However, with implementation of Mitigation Measures AQ-2, AQ-3, AQ-5 (which would reduce project-generated dust), impacts would be less than significant.

Remediation would require earth moving activities such as grading and may also require the removal or relocation of boulders and rock outcroppings, which could result in visual impacts to the visual character. However, Mitigation Measure BIO-5 would require a revegetation plan to be implemented in areas requiring soil excavation. In addition, Mitigation Measure BIO-5 requires that large boulders removed during cleanup to be replaced in a similar layout as existing conditions to retain the natural character of the area. With implementation of Mitigation Measure BIO-5 impacts would be reduced to less than significant.

In addition, since the overall site cleanup would involve removal of existing facilities,[3] backfilling, and revegetation of the project site, it would increase visual quality of the project site and its surroundings once completed. Specific impacts to the visual and community character are described in the following discussion in detail by each KOP.

KOP 1 – Albertson Fire Road West of the Project Looking Northeast (Impact 4.1-3a)

As shown in the Visual Quality Rating Analysis for KOP 1 in **Table 4.1-2**, KOP 1 is representative of recreational visitors' views from high-elevation trails and peaks west of the project site. The existing score is 16 (high level of visual quality) and the post-remediation score is 20 (very high level of visual quality). The overall site cleanup would alter the visual quality of the site by four points; however, changes would be less than significant and visual quality would be increased, as the project would replace existing contrasting buildings with open space and/or natural vegetation found in the site vicinity and enhance visual quality from this KOP.

[3] The NASA test stands located in Area II are eligible for listing in the Nation Register of Historic Places; however, as described in Section 3.4.2.1, *Buildings and Test Stands*, demolition of NASA's test stands are not subject to DTSC approval and are therefore not evaluated or described in this PEIR as part of the proposed project; impacts from this action are included in the cumulative analysis of this PEIR.

TABLE 4.1-2
VISUAL QUALITY RATING ANALYSIS – KOP 1

Sensitive Viewer: Recreational visitors from Albertson Fire Road southwest of the project
Existing condition is shown in Figure 4.1-6a, post-remediation condition is shown in Figure 4.1-6b.

Rated Feature	Existing Condition	Post-Remediation Score	Difference in Scores	Impact Significance
Landform	3	3	0	Less than significant
Explanation:	Views include dominant built features such as dirt roads in the foreground, and buildings on the project site in the background. Panoramic views of rolling hills, mountains in the background and varied terrain are important elements of the view.	The project would remove visible buildings and revegetate portions of the project site but would not substantially modify the area's landforms.		
Detail:	In both existing and post-remediation views, views include built features such as dirt roads in the foreground, and a panoramic view of varied landforms including flat areas, rolling hills, and rock outcroppings in the middleground and background. The project site, including existing gray buildings, can be seen in the background. Because there would be no significant change to the landforms on the project site, there would be no substantial impact to landforms resulting from implementation of the project. However, implementation of the project would increase the visual quality in the area by removing the buildings and returning the land to a more natural landform. Impacts would be less than significant.			
Vegetation	4	4	0	Less than significant
Explanation:	Low-lying chaparral and scrub species are present throughout the view from this KOP. Vegetation throughout the project site is consistent with that in the surrounding area. However; substantial portions of the site are located within previously developed areas with little or no vegetation.	The project would remove the existing vegetation during soil cleanup activities but the project would remove buildings and revegetate portions of the site with species consistent with the area.		
Detail:	Both the existing and post-reclamation views show low-lying chaparral and scrub species are present throughout the viewshed. Views of vegetation would increase within revegetated areas, however, because revegetated areas would be consistent with the vegetation in the area and surrounding the project site, no significant visual change in vegetation would occur from implementation of the project. Impacts would be less than significant.			
Water	1	1	0	No impact
Explanation:	No water is present on the project site or in the view.	No water would be introduced to the project site or their vicinity.		
Detail:	Neither existing nor post-remediation views include any water features.			

Sensitive Viewer: Recreational visitors from Albertson Fire Road southwest of the project
Existing condition is shown in Figure 4.1-6a, post-remediation condition is shown in Figure 4.1-6b.

Rated Feature	Existing Condition	Post-Remediation Score	Difference in Scores	Impact Significance
Color	3	4	1	Less than significant
Explanation:	There is a variety of colors, including greens, blues, browns, and reds, associated with rolling hills, rock outcroppings, and vegetation within the foreground and middleground. Grays and blacks associated with existing buildings at the project site are contrasting and somewhat dominant features in the background.	The project would remove the gray and black colors associated with buildings and replace them with green and brown colors.		
Detail:	Colors from this KOP are associated with landforms, vegetation, and buildings within the project site. The project would modify colors by removing the contrasting gray and black colors of buildings and replace them with browns and greens associated with revegetated areas and existing rock outcroppings that would become more visible after project implementation; impacts would be less than significant.			
Adjacent Scenery	5	5	0	Less than significant
Explanation:	Adjacent scenery, including mountains, rock outcroppings, vegetation, and open space lands, greatly enhances the view through the presence of open rolling hills and colorful vegetation.	Adjacent scenery would remain visible.		
Detail:	Adjacent scenery consists of varied topography, including panoramic views of rolling hills, and varied vegetation. The project would notably modify views of the project site, making it consistent with views of adjacent scenery, resulting in a less than significant impact.			
Scarcity	1	1	0	Less than significant
Explanation:	Similar to the viewshed throughout the region consisting of a built environment mixed in with open space and natural features.	Viewshed would be modified by removing industrial development.		
Detail:	Views offered by the existing conditions are typical of the Simi Valley and are not unique or unusual. Therefore, modifying the existing conditions to implement the project would result in less than significant impacts under this criterion.			

Sensitive Viewer: Recreational visitors from Albertson Fire Road southwest of the project Existing condition is shown in Figure 4.1-6a, post-remediation condition is shown in Figure 4.1-6b.				
Rated Feature	**Existing Condition**	**Post-Remediation Score**	**Difference in Scores**	**Impact Significance**
Cultural Modifications	-1	2	3	Less than significant
Explanation:	Man-made modifications in this view include roads in the foreground, middleground and throughout the KOP. Buildings and infrastructure at the project site can be seen and detract from the surrounding landscape.	The project would remove man-made features at the project site and portions of the site would be revegetated consistent with the surrounding landscape; therefore, implementation of the project would increase visual harmony from this view.		
Detail:	The existing view exhibits man-made modifications to the landscape and the post-remediation view shows these features mostly removed; with implementation of the project, the site would become more harmonious with the rest of the landscape, increasing the visual quality of this KOP. Impacts would be less than significant.			
Totals:	16	20	4	**Less than significant**

KOP 2 – Sage Ranch Rock Outcropping Looking Southeast (Impact 4.1-3a)

As shown in the in **Table 4.1-3**, KOP 2 is representative of recreationalist's views from Sage Ranch Park and trails north of the project site looking southwest. The existing conditions score is 13 (above-average level of visual quality) and the post-remediation score is 18 (high level of visual quality). The overall site cleanup would alter the visual quality of the project site by five points; however, it would replace existing contrasting buildings associated with the NASA ELV/Service Area with natural vegetation found in the surrounding landscape. With implementation of the project, the site would become more harmonious with the rest of the landscape, increasing the visual quality of this KOP. Impacts would be less than significant.

TABLE 4.1-3
VISUAL QUALITY RATING ANALYSIS – KOP 2

Sensitive Viewer: Recreational visitors to the north of the project within Sage Ranch Park looking southeast
Existing condition shown in Figure 4.1-7a; post-remediation condition is shown in Figure 4.1-7b.

Rated Feature	Existing Condition	Post-Remediation Score	Difference in Scores	Impact Significance
Landform	3	3	0	Less than significant
Explanation:	The project site is a dominant feature that consists of leveled topography with hardscape areas, buildings, and roads from KOP 2. A steep flat rock is a predominant feature in the foreground of this KOP and other outcroppings, mountains and varied landforms are visible throughout middleground and background views; these all form important elements throughout the KOP.	Buildings and infrastructure would be removed as part of the project, but the main access road would remain. The terrain would remain level at the project site, but portions would be revegetated; terrain in the surrounding area (outside the remediation areas) would not be modified.		
Detail:	In both the existing and post-remediation views, flat landforms with protruding buildings and infrastructure dominate views of the project site, with steep rock outcroppings, hills, and other varied landforms visible in the foreground and throughout the rest of the KOP. Although the project would remove buildings and infrastructure at the site, because the remediation areas would be re-contoured to mimic existing topography, there would be no significant change to the landforms on the project site; therefore, there would be no substantial impact to landforms resulting from implementation of the project.			
Vegetation	1	1	0	Less than significant
Explanation:	Low-lying vegetation comprising chaparral scrub and grass is mixed within the rock outcroppings throughout the KOP. While there is some vegetation along the boundary of the project site and within the Northern Undeveloped Area, most of the project site is hardscaped and the presence of vegetation is limited.	The project would remove the limited existing vegetation during cleanup activities; however, upon completion, portions of the project site would be revegetated; therefore vegetation in the KOP would increase.		
Detail:	Both the existing and post-reclamation views show low-lying vegetation mixed within rock outcroppings within the vicinity of the project. Little to no vegetation is shown in the pre-development view and upon completion of the project, portions of the project site would be revegetated, increasing vegetation from this KOP; therefore, impacts would be less than significant.			

Sensitive Viewer: Recreational visitors to the north of the project within Sage Ranch Park looking southeast
Existing condition shown in Figure 4.1-7a; post-remediation condition is shown in Figure 4.1-7b.

Rated Feature	Existing Condition	Post-Remediation Score	Difference in Scores	Impact Significance
Water	3	3	0	No impact
Explanation:	There is a small water feature within the middleground of the KOP that is somewhat dominant, as it is blue, which is contrasting in comparison to the colors in the surrounding area, and the predominant rock outcropping and existing access roads lead the viewer's eye to it.	The project would not modify the water feature.		
Detail:	Both the existing and post-reclamation views contain the water feature, as the project does not involve modifications to it.			
Color	2	3	1	Less than significant
Explanation:	There is moderate variation in colors from this KOP, containing reds, brown, greens, and blues associated with rock outcroppings, vegetation, and mountains throughout the KOP. In addition, the viewer's eye is drawn to the blue associated with the water feature in the middleground. Contrasting grays, blacks, and white associated with the project site and buildings are visible and predominant in the middleground.	The project would replace the contrasting gray, white and black colors found within the project site, and replace them with green and brown colors associated with restoring the vegetation and increased visibility of natural features behind the buildings.		
Detail:	Colors from this KOP are associated with rock outcroppings, vegetation, mountains, and buildings and other infrastructure within the project site. The project would modify colors by removing the contrasting gray and black colors of buildings and replace them with browns and greens associated with revegetated areas and existing rock outcroppings that would become more visible after project implementation; impacts would be less than significant.			
Adjacent Scenery	5	5	0	Less than significant
Explanation:	Adjacent scenery greatly enhances visual quality with varied topography, landforms, vegetation, and a water feature in the foreground and middleground; in addition, visual quality is increased by visible mountains in the background.	Adjacent scenery would remain visible and the project would make the project site consistent with adjacent scenery.		
Detail:	Adjacent scenery consists of visually pleasing varied textures and colors due to landforms and vegetation. Infrastructure at the project site currently decreases the visual quality as it conflicts with the surrounding landscape. With implementation of the project, the project site would become more consistent with adjacent scenery, resulting in a less than significant impact.			

Sensitive Viewer: Recreational visitors to the north of the project within Sage Ranch Park looking southeast
Existing condition shown in Figure 4.1-7a; post-remediation condition is shown in Figure 4.1-7b.

Rated Feature	Existing Condition	Post-Remediation Score	Difference in Scores	Impact Significance
Scarcity	1	1	0	Less than significant
Explanation:	Similar viewsheds throughout the region consisting of a built environment mixed in with open space and natural features.	Viewshed would be modified by removing industrial development.		
Detail:	Views offered by the existing conditions are typical of the Simi Valley and are not unique or unusual; therefore, modifying the existing conditions to implement the project would result in less-than-significant impacts under this criterion.			
Cultural Modifications	-2	2	4	Less than significant
Explanation:	Man-made modifications in this view include buildings and infrastructure at the project site which are dominating features from this view and detract from the surrounding landscape.	The project would remove man-made features shown from this KOP, and portions of the project site would be revegetated consistent with the surrounding landscape. Therefore, implementation of the project would not add visual variety or discordant element.		
Detail:	The existing view exhibits man-made modifications to the landscape and the post-remediation view shows these features mostly removed. With implementation of the project, the site would become more harmonious with the rest of the landscape, increasing the visual quality of this KOP. Impacts would be less than significant.			
Totals:	13	18	5	**Less than significant**

Conclusion: As analyzed above in the Visual Quality Rating Analysis for KOPs 1 and 2, implementation of the overall site cleanup would alter the visual quality of the project site by more than four points; however, it would replace existing contrasting buildings with natural vegetation within revegetated areas. In addition, the overall site cleanup would remove the contrasting gray, white, and black colors found within the project site and replace them with green and brown colors associated with revegetated areas and the increased visibility of natural features in the surrounding landscape. As shown in Tables 4.1-2 and 4.1-3, the post-remediation visual quality rating score increased by four points for KOP 1 and five points for KOP 2. Therefore, the project would not substantially degrade the existing visual character or quality of the site or its surroundings. In fact, with implementation of the project, the project site as a whole would become more harmonious with the rest of the landscape, generally increasing the visual quality of the area. Therefore, impacts would be less than significant.

Impact Determination 4.1-3a: *With implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5, remediation impacts would be less than significant. Once the* ***overall site cleanup*** *is completed, it would not substantially degrade the existing previously disturbed and developed visual character of the project site; impacts would be* ***less than significant****.*

Initial Project Assessment

Impact 4.1-3b: Would the **initial activities** substantially degrade the existing visual or community character or quality of the site and its surroundings?

DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal (Impact 4.1-3b)

As described under Impact 4.1-3a (*overall site cleanup* discussion), the project would alter the visual quality of the project site, including Area IV. Views of Area IV are limited to existing facilities within the background from KOP 1 and implementation of DOE soil removal activities would alter the visual character of Area IV. As previously described, impacts associated with cleanup would include the presence of staging and operation of equipment, as well as earth-moving activities and generation of dust. However, with implementation of Mitigation Measures AQ-2, AQ-3, AQ-5 (which would reduce project-generated dust), and BIO-5 (which would require revegetation of excavated areas), impacts would be less than significant.

Once completed, changes associated with implementation of the initial activities would improve the visual character of the area as would be seen from public views, as it would replace existing contrasting buildings with natural vegetation within revegetated areas, as shown in the visual simulations for KOP 1 (Figure 4.1-6b).

> Conclusion: With implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5, implementation of DOE's initial project would not substantially degrade the existing visual character or quality of either the site or its surroundings as would be seen from public views. In fact, once completed, the project would enhance the project site to become more harmonious with the rest of the landscape, generally increasing the visual quality of the area. Therefore, impacts associated with DOE's initial project would be less than significant with mitigation.

NASA Liquid Oxygen Plant (Impact 4.1-3b)

As described under Impact 4.1-3a, the overall site cleanup would alter the visual quality of the project site. The NASA Liquid Oxygen Plant area is visible from Sage Ranch Loop Trail (see Figure 4.1-4b). Views of the project site (Area I) and associated activities would be most prominent to recreational visitors along the Sage Ranch Loop Trail. As previously described, visual impacts associated with remediation would include the presence of staging and operation of equipment, as well as earth-moving activities and generation of dust. However, with implementation of Mitigation Measures AQ-2, AQ-3, AQ-5 (which would reduce project-generated dust), and BIO-5 (which would require revegetation of excavated areas), impacts would be less than significant.

Visual changes associated with these initial activities would result from excavation, grading to mimic natural contours, and revegetation. All structures that once existed at this site have previously been demolished with the exception of an at grade concrete slab. The site is generally flat and contains weeds due to previous disturbance. Grading the area to mimic natural contours and revegetation is expected to improve the visual quality of the area. With implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5, this impact would be less than significant.

> Conclusion: With implementation of Mitigation Measures AQ-2, AQ-3. AQ-5, and BIO-5, remediation of NASA's initial project would not substantially degrade the existing visual character or quality of either the site or its surroundings. In fact, once completed, the project would enhance the site as a whole to become more harmonious with the rest of the landscape, generally increasing the visual quality of the area. Therefore, impacts associated with the NASA initial project would be less than significant with mitigation.

Demolition Activities (Impact 4.1-3b)

DOE demolition activities would occur in Area IV and impacts would be similar to those previously described for KOPs 1 and 2. Although visual impacts associated with remediation would include the presence of staging and operation of equipment and generation of dust, impacts would be reduced to a less-than-significant level with implementation of Mitigation Measures AQ-2, AQ-3, AQ-5 (which would reduce -generated dust), and BIO-5 (which would require revegetation of excavated areas),

Once implemented, visual impacts would be consistent with those identified for the overall site cleanup (Impact 4.1-3a), as demolition and removal of these facilities would remove discordant features in the landscape such as buildings, and replace them with harmonious features such as natural landscaped areas, the activities would generally increase the visual quality of the area. These demolition activities would not substantially degrade the existing visual character or quality of the site or its surroundings and impacts would be less than significant.

> Conclusion: With implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5, DOE demolition activities would not substantially degrade the existing visual character or quality of either the site or its surroundings. Once completed, demolition would enhance the site as a whole to become more harmonious with the rest of the landscape, generally increasing the visual quality of the area. Therefore, impacts associated with these activities would be less than significant with mitigation.

RCRA Post-Closure and Hazardous Waste Facility Closure (Impact 4.1-3b)

This discussion addresses the five closure projects described in Section 3.7.4, *RCRA Post-Closure and Hazardous Waste Facility Closure*, of this PEIR:

- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure

- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

Because these activities would be located within Area I and Area IV, impacts would be similar to those previously described for the NASA and DOE initial projects; visual impacts associated with project implementation, including staging and operation of remediation equipment and dust generation, would be reduced to a less-than-significant level with implementation of Mitigation Measures AQ-2, AQ-3, AQ-5 (which would reduce project-generated dust), and BIO-5 (which would require revegetation of excavated areas). Once completed, these activities would remove discordant features in the landscape such as buildings and replace them with harmonious features such as natural landscaped areas; ergo, the project would generally increase the visual quality of the area. Consistent with the analysis of the overall site cleanup, the RCRA post-closure activities and hazardous waste facility closure activities would not substantially degrade the existing visual character or quality of the site or its surroundings.

> Conclusion: With implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5, remediation activities associated with the RCRA post-closure and hazardous waste facility closure would not substantially degrade the existing visual character or quality of the site or its surroundings. Once completed, the project would enhance the project site as a whole to become more harmonious with the rest of the landscape, generally increasing the visual quality of the area. Therefore, impacts associated with RCRA post-closure hazardous waste facility closure activities would be less than significant with mitigation.

Areas I, II, and III Impoundment Post-Closure (Impact 4.1-3b)

The activities associated with the NASA and Boeing impoundment permits are limited to managing impoundments through monitoring and periodic maintenance, as summarized under Impact 4.1-1b.

No earth-moving activities would be required; impacts would be limited to the presence of work crews of three people, worker vehicles, and light trucks during monitoring activities, which would be less than those described for Impacts 4.1-1b and 4.1-2b. NASA and Boeing impoundment monitoring and maintenance activities would not substantially degrade the existing visual character or quality of either the site or its surroundings.

> Conclusion: Implementation of NASA and Boeing impoundment post-closure permit activities would not substantially degrade the existing visual character or quality of either the site or its surroundings. Therefore, impacts would be less than significant.

Impact 4.1-3b Determination: *With implementation of Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5, the* ***initial activities*** *would not substantially degrade the existing previously disturbed and developed visual character of the project site; impacts would be* ***less than significant with mitigation****.*

4.1.5.4 Light and Glare

Program Assessment

Impact 4.1-4a: Would the **overall site cleanup** create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area?

Overall Site Cleanup (Impact 4.1-4a)

The project would not create a new source of substantial light or glare that would significantly impact daytime or nighttime public views in the area. For purposes of this analysis, a significant impact on daytime or nighttime public views is defined as circumstances in which remediation activities would introduce dominant visual elements that could impact light or glare and involve one or more of the following:

- Substantially increase light and glare in the project vicinity
- Substantially increase the backscatter of light into the nighttime sky

As described in Section 3.6.5, *Schedule, Workforce, and Equipment*, of this PEIR, most site activities would occur 5 days per week (Monday through Friday), 11 hours per day, and during daylight hours (7:00 a.m. to 6:00 p.m.). However, nighttime security lighting at construction laydown areas may be necessary, which would create a new source of light in the project area. However, with the exception of recreationists within Sage Ranch Park (only accessible during daylight hours), the project site is generally not visible to the public. Therefore, implementation of the project would not create a new source of light that would adversely affect daytime or nighttime views in the area. Remediation equipment and activities may be seen from KOPs 1 and 2 during the day, creating a temporary source of additional glare. However, the site currently contains equipment, vehicles, and facilities that produce similar light and glare. In addition, the project would ultimately remove existing facilities that currently create a source of light and glare at the project site and replace them with vegetation and fill, resulting in fewer impacts regarding light and glare. Given these project site characteristics, any sources of light or glare associated with remediation equipment would not substantially affect daytime or nighttime views in the area.

> Conclusion: Implementation of the overall site cleanup would not result in a significant amount of light or glare that would substantially affect daytime or nighttime views in the area. Therefore, impacts to views associated with daytime and nighttime sources of light and glare would be less than significant.

Impact Determination4.1-4a: *Given the project site characteristics and* ***overall site cleanup****, sources of light or glare associated with remediation would not substantially affect daytime or nighttime views in the area. Therefore, impacts to views associated with daytime and nighttime sources of light and glare would be* ***less than significant****.*

Initial Project Assessment

Impact 4.1-4b: Would the **initial activities** create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area?

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the following projects would be implemented after approval by DTSC including:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The RPs have identified initial projects that are ready to be implemented, as summarized under Impact 4.1-1b and described in detail in Section 3.7, *Initial Activities*. As described under the analysis for the overall site cleanup activities, the initial projects would not create a new source of substantial light or glare that would significantly impact daytime or nighttime public views in the area; impacts would be less than significant.

> Conclusion: The initial activities would not create a new source of substantial light or glare that would significantly impact daytime or nighttime public views in the area; impacts would be less than significant.

Impact 4.1-4b Determination: *The* ***initial activities*** *do not include any long-term sources of light or glare and short-term sources of light or glare associated with remediation would not substantially affect daytime or nighttime views in the area. Therefore, impacts associated with daytime and nighttime sources of light and glare would be* ***less than significant.***

4.1.6 Mitigation Measures

The following measures shall be implemented to mitigate impacts related to aesthetics:

AQ-2 Air Quality Monitoring Plan (see Section 4.2.6 for description)

AQ-3 Fugitive Dust Control (see Section 4.2.6 for description)

AQ-5 Idling Restrictions (see Section 4.2.6 for description)

BIO-5 Revegetation Plan (see Section 4.3.6 for description)

4.1.7 Impact Summary

Table 4.1-4 summarizes the overall site cleanup and initial activities impacts and significance determinations related to aesthetics.

TABLE 4.1-4
SUMMARY OF IMPACTS – AESTHETICS

Impact	Overall Project	DOE Initial Project	NASA Initial Project	DOE Demolition Activities*	RCRA Post-Closure Facility Closure	Mitigation Measures
Impact 4.1-1a: Scenic Vistas	LSM	--	--	--	--	AQ-2, AQ-3, AQ-5, and BIO-5
Impact 4.1-1b: Scenic Vistas	--	LSM	LSM	LSM	LSM	AQ-2, AQ-3, AQ-5, and BIO-5
Impact 4.1-2a: Scenic Resources within a State Scenic Highway	LTS	--	--	--	--	N/A
Impact 4.1-2b: Scenic Resources within a State Scenic Highway	--	LTS	LTS	LTS	LTS	N/A
Impact 4.1-3a: Visual or Community Character	LSM	--	--	--	--	AQ-2, AQ-3, AQ-5, and BIO-5
Impact 4.1-3b: Visual or Community Character	--	LSM	LSM	LSM	LSM	AQ-2, AQ-3, AQ-5, and BIO-5
Impact 4.1-4a: Light and Glare	LTS	--	--	--	--	N/A
Impact 4.1-4b: Light and Glare	--	LTS	LTS	LTS	LTS	N/A

LTS = Less than significant
LSM = Less than significant with mitigation incorporated
N/A = Not applicable

4.2 Air Quality

This section evaluates the potential for air quality impacts to result from implementation of the overall site cleanup and the initial activities. The existing air quality setting is described along with the relevant regulatory background. Project impacts and mitigation measures, as necessary, are presented.

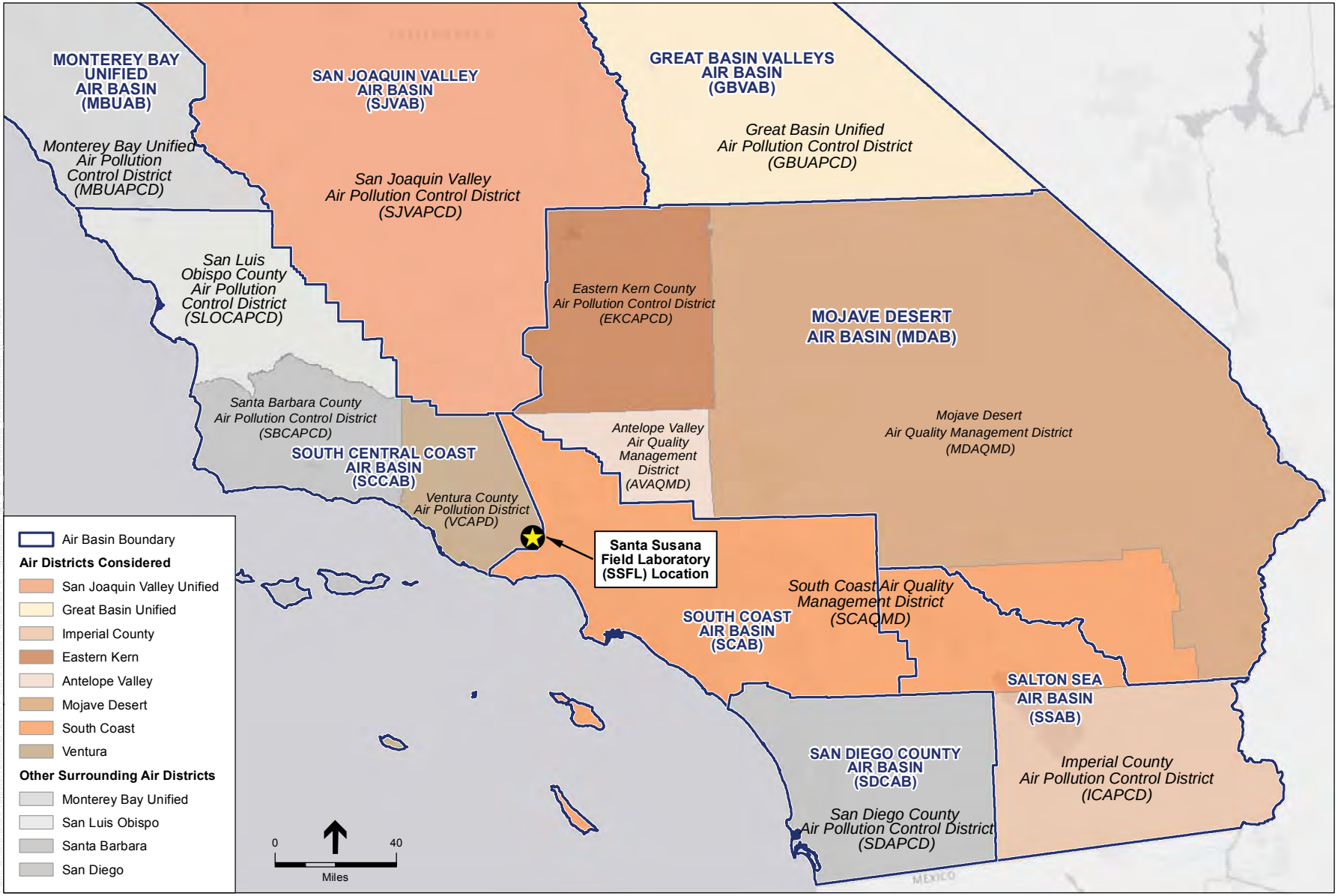
4.2.1 Environmental Setting

The SSFL site is located in the South Central Coast Air Basin (SCCAB), which comprises Ventura County, Santa Barbara County, and San Luis Obispo County. The project site is under the jurisdiction of the Ventura County Air Pollution Control District (VCAPCD). However, the area to the east of the project site, where the majority of the truck trips would occur, is located in the South Coast Air Basin (SCAB) and is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). Therefore, the project has been evaluated against thresholds for one or both districts, as applicable. The ambient concentrations of air pollutants are determined by the amount of emissions released by sources and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources. Because of the location of the disposal sites, the trucks generated by project activities could traverse a number of air basin and air pollution control districts. The following briefly describes the four additional air basins and six additional air pollution control districts that may be impacted by the proposed project activities. Trucks may traverse the boundaries of the Antelope Valley Air Quality Management District (AVAQMD), Mojave Desert Air Quality Management District (MDAQMD), and the Eastern Kern County Air Pollution Control District (EKCAPCD) all located within the Mojave Desert Air Basin (MDAB); the San Joaquin Valley Air Pollution Control District (SJVAPCD) within the San Joaquin Valley Air Basin (SJVAB); the Imperial County Air Pollution Control District (ICAPCD) within the Salton Sea Air Basin (SSAB); or the Great Basin Unified Air Pollution Control District (GBUAPCD) within the Great Basin Valleys Air Basin (GBVAB). **Figure 4.2-1** shows the Air Basin and Air District boundaries.

4.2.1.1 Regional Climate and Meteorological Conditions

South Central Coast Air Basin

The topography and climate of southern California combine to make the SCCAB an area of high air pollution potential. Limited dispersion of emissions and increases in ambient air pollution levels result from the weak vertical and horizontal dispersion characteristics within Ventura County. Temperature inversions persist and prevent pollutants from rising and dispersing. The mountain ranges within southern California inhibit horizontal dispersion of pollutants.



Source: ESRI, California Air Resources Board

Santa Susana Field Laboratory

Figure 4.2-1

Air Districts and Air Basins

Air is recirculated in Ventura County as a result of the diurnal land/sea breeze pattern. In the early mornings, the land breeze pushes air pollutants toward the ocean, and in the afternoon, pollutants are pushed east by the sea breeze. This causes pollutants to remain in the SCCAB for several days. Ambient air pollution levels of ozone (a secondary pollutant formed in the atmosphere when oxides of nitrogen and reactive organic gases react in the presence of sunlight) increase due to emissions from the previous days reacting with new emissions and in the presence of sunlight. This effect is mostly observed from May through October, when air temperatures are higher and sunlight is more intense. Most of Ventura County's ozone standard exceedances occur during this 6-month period (VCAPCD, 2003).

South Coast Air Basin

The SCAB covers approximately 6,745 square miles and is bounded by the Pacific Ocean to the west and south and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The air basin includes all of Orange County; the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties; and the San Gorgonio Pass area in Riverside County. The terrain and geographic location determine the distinctive climate of the SCAB, which is a coastal plain with connecting broad valleys and low hills (SCAQMD, 1993).

The study area lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild and tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the SCAB is a function of the area's natural physical characteristics (weather and topography), as well as human-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and dispersion of pollutants throughout the SCAB, making it an area of high pollution potential (SCAQMD, 1993).

The worst air pollution conditions in the SCAB occur from June through September. These are generally attributed to the large amount of pollutant emissions, light winds, and shallow vertical atmospheric mixing. These conditions frequently reduce pollutant dispersion and, thereby, cause elevated air pollution levels. Pollutant concentrations in the SCAB vary with location, season, and time of day. Ozone concentrations, for example, tend to be lowest along the coast, increasing downwind towards the inland valleys, and highest in the Central San Bernardino Mountain (SCAQMD, 2016a).

Mojave Desert Air Basin

The MDAB comprises mountain ranges varying from 1,000 feet to up to 10,000 feet above the valley floor. Mountain ranges are interspersed with long broad valleys that often contain dry lakebeds. Because of the proximity of the basin to coastal and central regions and the Sierra Nevada Mountains to the north, the prevailing winds in the MDAB are from the west and southwest (AVAQMD, 2011).

Pacific subtropical high cells influence air quality during the summer by inhibiting cloud formation and encouraging daytime solar heating. Infrequent warm, moist air masses from the

south contribute most of the precipitation to the basin, as cold air masses from Canada and Alaska are diffuse by the time they reach the desert. Precipitation in the basin averages between 3 and 7 inches a year. The dry-hot to very dry-hot climate has months where the average is over 100.0 degrees Fahrenheit (°F) (AVAQMD 2011).

The AVAQMD is bordered to the northwest by the Tehachapi Mountains and is separated from the Sierra Nevada Mountain Range to the north by the Tehachapi Pass. The San Gabriel Mountains border the Antelope Valley to the south and the AVAQMD is bisected by Soledad Canyon. The AVAQMD has jurisdiction over the northern (desert) portion of Los Angeles County and includes the incorporated cities of Lancaster and Palmdale, Air Force Plant 42, and the southern portion of Edwards Air Force Base. The AVAQMD is bounded by the Kern County–Los Angeles County border to the north, and San Bernardino County–Los Angeles County border to the east (AVAQMD, 2011).

The MDAQMD is bordered by the San Bernardino Mountains in the southwest and the Cajon Pass separates the MDAQMD from the San Gabriel Mountains. The MDAQMD's jurisdiction covers the desert portion of San Bernardino County as well as the far eastern end of Riverside County. Cities under the MDAQMD's jurisdiction include Adelanto, Apple Valley, Barstow, Blythe, Hesperia, Needles, Twentynine Palms, Victorville, and Yucca Valley. The eastern portion of Edwards Air Force Base, a portion of China Lake Naval Air Weapons Station, Fort Irwin's National Training Center, the Marine Corps Logistics Base, and the Marine Corps Air Ground Combat Center are also within the MDAQMD's region (MDAQMD, 2016).

The EKCAPCD is bordered to the north by Tulare and Inyo Counties, to the east by San Bernardino County, and to the south by Los Angeles County. The western border of the EKCAPCD follows no stated landmarks, but roughly starts where the Pacific Crest Trail meets the southern border, then meanders north around the west of Bear Mountain, then continues north and meets the northern border west of Alta Sierra. Cities under the jurisdiction of the EKCAPCD include Tehachapi, California City, and Ridgecrest. Additionally, the western portion of Edwards Air Force Base is within the district borders (EKCAPCD, 2016).

San Joaquin Valley Air Basin

The SJVAB is the second largest air basin by area in California representing 16 percent of California's geographic area. Fresno, Western and Central Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare Counties are all within the SJVAB. The SJVAB is approximately 250 miles long and 35 miles wide. It is bordered to the east by the Sierra Nevada Mountains, the Coast Ranges to the west, Tehachapi Mountains to the south, and the Sacramento Valley to the north. The bowl-shaped topography inhibits pollutant movement out of the valley (SJVAPCD, 2015).

The SJVAB is part of a Mediterranean Climate Zone characterized by sparse rainfall occurring mainly in the winter. Maximum temperatures often exceed 100 °F in the valley. Wind in the SJVAB typically blows toward the northwest especially during the summer. The winter results in

periods of stagnation where winds are very weak again trapping pollutants in the valley (SJVAPCD, 2015).

The SJVAPCD has jurisdiction over the entire SJVAB. Cities under the jurisdiction of the SJVAPCD include Stockton, Modesto, Merced, Madera, Fresno, Hanford, Visalia, and Bakersfield (SJVAPCD, 2015).

Salton Sea Air Basin

The middle part of Riverside County and Imperial County comprise the SSAB. The San Jacinto Mountains separate the SSAB from the SCAB to the west and the Little San Bernardino Mountains separate it from the Mojave Desert Air Basin to the north and east. The Imperial County portion of the SSAB is bordered to the west by the San Diego County Air Pollution Control District. The southern boundary of the SSAB is the Mexico Border (California Air Resources Board [CARB], 2014).

Winter temperatures are mild ranging from 65 °F to 75 °F while hot summers are characterized by temperatures between 104°F and 115 °F. Annual rainfall is approximately 3 inches with most of the rainfall in late summer and midwinter. Prevailing winds are from the west and northwest originating in the Los Angeles area (ICAPCD, 2010).

Imperial County occupies the southeastern corner of California bordered to the east by Arizona, to the North by Riverside County, to the west by San Diego County, and to the south by Mexico. ICAPCD's jurisdiction covers all 4,482 square miles of Imperial County including the cities of Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial and Westmorland (ICAPCD, 2010).

Great Basin Valleys

Great Basin Unified Air Pollution Control District

The GBVAB is comprised of Alpine, Mono, and Inyo Counties. The GBVAB covers approximately 9 million acres with a population of about 32,000 people (GBUAPCD, 2016). The average temperature in Inyo County is 58.0 °F with the average maximum of 72.9 °F and the average minimum of 43.0 °F. Annual rainfall is approximately 6 inches with the majority falling between December and March. Average snowfall is approximately 1.8 inches with the most in January. Average Wind speed is approximately 17 mph with the highest winds occurring in January when winds can average over 40 mph (World Media Group, 2016).

The GBUAPCD has jurisdiction over the entire Great Basin Valleys Air Basin. Cities under the jurisdiction of the GBUAPCD include Silver Creek, Marklee Village, Silver Mountain, Fredricksburg, Mammoth Lakes, Bridgeport, Bishop, Death Valley Junction, and Badwater.

Project Vicinity

Data from the Western Regional Climate Center's Thousand Oaks 1 SW California Station (048904), was used to characterize climate conditions in the study area. Over the period of record (2004–2010), the average annual temperatures in the study area range from a low of 50.5 °F to a high of 73.7 °F. Summer (August) high and low temperatures were 84.5 °F and 58.9 °F,

respectively. The average winter (February) high and low temperatures were 65.0 °F and 45.0 °F, respectively, while temperatures rarely drop below 32.0°F. Rainfall varies widely from year to year, with an annual average of 10.5 inches (WRCC, 2010).

Wind patterns in the study area arise primarily from the west, with seasonal and diurnal variations (WRCC, 2002). Over the period of record (1996–2006), winds at the Oxnard Airport station averaged a speed of 7.2 miles per hour (WRCC, 2006).

4.2.1.2 Pollutants of Concern

To protect human health and the environment, the USEPA has set "primary" and "secondary" maximum ambient limits for each of the criteria pollutants. Primary standards were set to protect human health, particularly with sensitive population, such as children, the elderly, and individuals suffering from chronic lung conditions, such as asthma and emphysema. Secondary standards were set to protect the natural environment and prevent damage to animals, crops, vegetation, and buildings. Ozone (O_3) and nitrogen dioxide (NO_2) are considered regional pollutants because they (and their precursors) affect air quality on a regional scale. Pollutants such as carbon monoxide (CO), sulfur dioxide (SO_2), and lead (Pb) are considered local pollutants that tend to accumulate in the air locally. Particulate matter (PM) is both a local and regional pollutant (USEPA, 2016a).

The pollutants of concern within the SCCAB and SCAB including the project are O_3 (including oxides of nitrogen [NO_X] and reactive organic gases [ROG[1]]), CO, and particulate matter. Principal characteristics surrounding these pollutants are discussed below. Toxic air contaminants (TACs) and Valley Fever are also discussed, although no air quality standards exist for these pollutants.

Ozone

Ozone, or smog, is photochemical oxidant that is formed when ROG and NO_X (both by-products of the internal combustion engine) react with sunlight. Ozone poses a health threat to those who already suffer from respiratory diseases as well as to healthy people. Additionally, ozone has been tied to crop damage, typically in the form of stunted growth and premature death. Ozone also can act as a corrosive, resulting in property damage such as the degradation of rubber products and is a respiratory irritant that can cause severe ear, nose, and throat irritation and increased susceptibility to respiratory infections. It is also an oxidant that causes extensive damage to plants through leaf discoloration and cell damage (CDC, 2014). According to CARB, exposure to ozone is "associated with symptoms such as coughing, chest tightness, shortness of breath, and the worsening of asthma symptoms. The greatest risk for harmful health effects belongs to outdoor workers, athletes, children and others who spend greater amounts of time outdoors during smoggy periods" (CARB, 2015b).

[1] In the analysis ROGs are used as a surrogate for reactive organic compounds (ROCs) regulated by VCAPCD and volatile organic compounds (VOCs) regulated by SCAQMD.

Reactive Organic Gases

ROG are compounds made up primarily of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major source of hydrocarbons. Other sources of ROG are emissions associated with the use of paints and solvents, the application of asphalt paving, and the use of household consumer products such as aerosols. Adverse effects on human health are not caused directly by ROG but rather by reactions of ROG that form secondary pollutants such as ozone (CDC, 2014).

Reactive Organic Compounds

ROCs refer to any organic compound with at least one carbon atom that are not photochemically reactive and therefore do not participate in smog formation. They are sometimes referred to as reactive organic gases, non-methane organic compounds, or volatile organic compounds (VCAPCD, 2003). Like ROGs, they are a contributor to ozone formation.

Volatile Organic Compounds (VOC)

VOC's refer to any organic compound with at least one carbon atom that are not photochemically reactive and therefore do not participate in smog formation. They are sometimes referred to as reactive organic gases and reactive organic compounds (VCAPCD, 2003). They are key ingredients in architectural coatings and are contained in gasoline and diesel fuels. Like ROGs, they are a contributor to ozone formation.

Nitrogen Oxides

Nitrogen oxides are a family of highly reactive gases that are a primary precursor to the formation of ground-level ozone and react in the atmosphere to form acid rain. The two major forms of NO_X are nitric oxide (NO) and NO_2. NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. Health-based ambient air quality standards have been promulgated for NO_2, which is a reddish-brown gas formed by the combination of NO and oxygen. NO_X acts as an acute respiratory irritant and increases susceptibility to respiratory pathogens (CDC, 2014). NO_2 can potentially irritate the nose and throat, aggravate lung and heart problems, and may increase susceptibility to respiratory infections, especially in people with asthma. According to CARB, "NO_2 is a reactive, oxidizing gas capable of damaging cells lining the respiratory tract. Exposure to NO_2 along with other traffic-related pollutants, is associated with respiratory symptoms, episodes of respiratory illness and impaired lung functioning. Studies in animals have reported biochemical, structural, and cellular changes in the lung when exposed to NO_2 above the level of the current state air quality standard. Clinical studies of human subjects suggest that NO_2 exposure to levels near the current standard may worsen the effect of allergens in allergic asthmatics, especially in children" (CARB, 2011).

Carbon Monoxide

Carbon monoxide is a colorless, odorless, toxic gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. In the study area, high CO levels are of greatest concern during the winter, when periods of light winds combine with the formation of ground-

level temperature inversions from evening through early morning. These conditions trap pollutants near the ground, reducing the dispersion of vehicle emissions. Moreover, motor vehicles exhibit increased CO emission rates at low air temperatures. The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation (CDC, 2014).

Particulate Matter

Particulate matter consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of fine particulates now are recognized: inhalable course particles of 10 microns or smaller (PM_{10}), and inhalable fine particles of 2.5 microns or less ($PM_{2.5}$). Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. However, wind on arid landscapes also contributes substantially to local particulate loading. Activities such as crushing or grinding operations, and driving vehicles on paved and unpaved roads result in fugitive dust, including $PM_{10,}$ pollen and mold. As described above, fine particles, $PM_{2.5,}$ are produced from all types of combustion, including motor vehicles, power plants, wood burning, agricultural burning and some industrial processes. Both PM_{10} and $PM_{2.5}$ may adversely affect the human respiratory system, especially in people who are naturally sensitive or susceptible to breathing problems (CDC, 2014). Particulate matter generally is "associated with increased risk of hospitalization for lung and heart-related respiratory illness, including emergency room visits for asthma. Particulate matter exposure is also associated with increased risk of premature deaths, especially in the elderly and people with pre-existing cardiopulmonary disease. In children, studies have shown associations between particulate matter exposure and reduced lung function and increased respiratory symptoms and illnesses" (CARB, 2005b).

Toxic Air Contaminants

For the purposes of CEQA, DTSC has established thresholds of significance applicable to the project for TAC emissions during implementation of the cleanup. The significance criteria and analysis of potential impacts related to TAC emissions are provided in in Section 4.7, *Hazards and Hazardous Materials*, of this PEIR.

Valley Fever

For the purposes of CEQA, and because of the location of the project, the analysis considers Valley Fever a potential concern for residents and workers alike. Valley Fever (formally known as *Coccidioidomycosis*) is an infectious disease caused by the fungus *Coccidioides immitis*. Infection is caused by inhalation of *Coccidioides immitis* spores that have become airborne when dry, dusty soil or dirt is disturbed by wind, construction, farming, or other activities. The Valley Fever fungus tends to be found at the base of hillsides, in virgin, undisturbed soil and is found in the southwestern United States. In its primary form, symptoms appear as a mild upper respiratory infection, acute bronchitis, or pneumonia. The most common symptoms are fatigue, cough, chest pain, fever, rash, headache, and joint aches, although 60 percent of people infected are asymptomatic and do not seek medical attention. In the remaining 40 percent, symptoms range from mild to severe (County of Los Angeles, 2015).

The fungus "may be associated with alkaline soil that has a high salt content, rodent burrows and Amerindian middens at archeological antecedents of the disease are largely unstudied" (Baker, 2011). In other words, sites that meet any of these conditions may increase the chance that the fungus is present, but does not mean with any certainly that it is actually present at a particular location. The most notable incident of Valley Fever in southern California occurred when the 1994 earthquake in Northridge triggered landslides that moved mass amounts of dust. The dust clouds caused 243 new cases of Valley Fever of which the majority were located in Simi Valley in Ventura County (VCAPCD, 2003).

Valley Fever's proliferation after the 1994 Northridge earthquake is an anomaly. The average number of reported cases before 1994 was 40 per year. Since 1995, the number of reported cases has been consistent with the pre-1994 average (VCAPCD, 2003). Landslides are isolated and powerful events generated by tectonic events that lack an equivalency to a controlled cleanup site. The excavation of the site would not result in landslide-like or severe earthquake like conditions and therefore would not be anticipated to result in the level disturbance as these natural events.

4.2.1.3 Existing Conditions

Current operations onsite include monitoring and maintenance for the existing groundwater extraction and treatment system and the existing surface water treatment systems. In support of the continuing activities, each of the RPs has workers or contractors accessing the site daily. Boeing has 15 workers and 15 contractors, DOE has 2 workers, and NASA has 5 workers.[2] The commuting and onsite travel of these workers and contractors result in the emissions of criteria pollutants. Emissions were quantified using the same methodologies as identified in the Methodology section for worker travel. **Table 4.2-1** shows the existing emissions by RP.

VCAPCD

The VCAPCD currently operates six monitoring stations throughout the SCCAB. The closest monitoring station to the project is the Simi Valley Monitoring Station located at 5400 Cochran Street in Simi Valley, California, approximately 2.5 miles north of the project site. The Simi Valley Monitoring Station monitors ozone, $PM_{2.5}$, PM_{10} and NO_2. Currently, CO and SO_2 are not monitored by VCAPCD. The historical ambient air data for monitored criteria pollutants from these two stations are shown in **Table 4.2-2** for the five most recent years (2012 through 2016). Pollutant concentrations vary from year to year based on weather conditions and the changes to land use patterns.

[2] Existing onsite emissions are based on the operations occurring onsite at the time of the NOP. The NOP was completed before the NASA demolition of existing structures. The personnel onsite consist of one NASA civil servant and four NASA contractors for environmental investigation (NASA, 2016). The analysis assumed 6 workers as a worst case scenario based on the information provided at the time the analysis was conducted.

TABLE 4.2-1
EXISTING ON-SITE EMISSIONS

	Estimated Emissions (Pounds per Day)[1]					
	ROC/VOC	NO_X	CO	SO_X	PM_{10}[2]	$PM_{2.5}$[2]
Project Total (Longest Route)						
Boeing	<1	<1	5	<1	42	4
DOE	<1	<1	<1	<1	3	<1
NASA[3]	<1	<1	1	<1	8	1
Total	<1	<1	6	<1	53	6

1 Totals may not add exactly due to rounding; "<" indicates that emissions are less than the indicated value.
2 Emissions from PM10 and PM2.5 include fugitive dust from on-road travel.
3 NASA demolition was not active at the time of the NOP; therefore, only emissions associated with NASA's workers are reported for existing conditions (NASA, 2013).

SOURCE: ESA, 2017a (see Appendix D).

SCAQMD

The SCAQMD currently operates 29 monitoring stations throughout the SCAB. The closest monitoring station to the project site is the Reseda Monitoring Station located at 18330 Gault Street in Reseda, California, approximately 8 miles southeast of the project site. The monitoring station only monitors hourly ozone, $PM_{2.5,}$ CO, and $NO_{2.}$ The second closest monitoring station to the project site, which monitors $PM_{10,}$ is the Santa Clarita Monitoring Station. The station is located at 22224 Placerita Canyon Road in Santa Clarita, California, approximately 13 miles northeast. Currently, SO_2 is not monitored by SCAQMD at a station close enough to be representative of the project area and therefore SO_2 is not included in summary data for SCAQMD. The historical ambient air data for monitored criteria pollutants from these two stations are shown in **Table 4.2-3** for the five most recent years (2012 through 2016). Pollutant concentrations vary from year to year based on weather conditions and the changes to land use patterns.

Both CARB and USEPA use this type of monitoring data to designate areas according to their attainment status for criteria air pollutants. The purpose of these designations is to identify the areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Nonattainment designation refers to an area considered to have concentration of one or more criteria pollutants that exceed the National Ambient Air Quality Standards (NAAQS) and/or the California Ambient Air Quality Standards (CAAQS). The attainment designation refers to an area with concentrations of criteria pollutants that are below the levels established by the NAAQS and/or CAAQS. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of nonattainment-transitional, which is given to nonattainment areas that are progressing and nearing attainment. The SCCAB (Ventura County) is currently classified as a federal nonattainment area for ozone. The SCCAB is currently classified as a state nonattainment area for ozone and PM_{10}. The SCCAB is in

attainment for all other criteria pollutants. The SCAB is classified as a federal nonattainment area for ozone and $PM_{2.5}$, and Los Angeles County is classified as nonattainment for lead. The SCAB is nonattainment of state standards for ozone, PM_{10}, and $PM_{2.5}$. The SCAB is in attainment or is unclassified for all other criteria pollutants. The current attainment status for the SCCAB and SCAB are provided in **Table 4.2-4**.

TABLE 4.2-2
VCAPCD AIR QUALITY DATA SUMMARY (2012–2016)

		Monitoring Data by Year				
Pollutant	**Standard[a]**	**2012**	**2013**	**2014**	**2015**	**2016**
Ozone – Simi Valley Monitoring Station						
Highest 1-Hour Average (ppm) [b]		0.106	0.104	0.097	0.96	0.101
Days over State Standard	0.09 ppm	3	3	1	1	1
Highest 8-Hour Average (ppm)[b]		0.087	0.089	0.085	0.078	0.083
Days over National Standard	0.070 ppm	22	10	15	13	7
Days over State Standard	0.070 ppm	24	11	16	14	8
Nitrogen Dioxide – Simi Valley Monitoring Station						
Highest 1-Hour Average (ppm) [b]		0.058	0.043	0.047	0.041	0.039
Days over National Standard	0.10 ppm	0	0	0	0	0
Days over State Standard	0.18 ppm	0	0	0	0	0
Annual Average (ppm)[b]		0.010	0.009	0.009	0.008	0.008
Days over National Standard	0.053 ppm	0	0	0	0	0
Days over State Standard	0.03 ppm	0	0	0	0	0
Particulate Matter (PM_{10}) – Simi Valley Monitoring Station						
Highest 24-Hour Average ($\mu g/m^3$)[c]		39.5	41.1	49.6	63.5	166.1
Days over National Standard (measured)	150 $\mu g/m^3$	0	0	0	0	1
Days over State Standard (measured)	50 $\mu g/m^3$	0	0	0	3	3
Annual Average ($\mu g/m^3$)	20 $\mu g/m^3$	19.5	22.6	24.1	22.2	25.4
Particulate Matter ($PM_{2.5}$) – Simi Valley Monitoring Station						
Highest 24-Hour Average ($\mu g/m^3$)[d]		28.1	28.6	30.8	33.0	31.4
Days over National Standard (measured)	35 $\mu g/m^3$	0	0	0	0	0
Annual Average ($\mu g/m^3$)	12 $\mu g/m^3$	9.2	9.2	9.0	8.3	*

ppm = parts per million; µg/m3 = micrograms per cubic meter.

* Data is not available for that year.

a Generally, state standards and national standards are not to be exceeded more than once per year.

b The highest average reported is the 1st highest average for State and National. The days over standard for national and state are based on different criteria and therefore may be different even though the standards are the same.

c Concentrations and averages represent federal statistics. State and federal statistics may differ because of different sampling methods.

d Concentrations and averages represent state statistics. State and federal statistics may differ because of different sampling methods.

SOURCE: CARB, 2017.

TABLE 4.2-3
SCAQMD AIR QUALITY DATA SUMMARY (2012–2016)

Pollutant	Standard[a]	Monitoring Data by Year				
		2012	2013	2014	2015	2016
Ozone – Reseda Monitoring Station						
Highest 1-Hour Average (ppm)[b]		0.129	0.124	0.116	0.119	0.122
Days over State Standard	0.09 ppm	18	7	6	11	9
Highest 8-Hour Average (ppm)[b]		0.098	0.092	0.092	0.094	0.098
Days over National Standard	0.070 ppm	38	20	27	32	23
Days over State Standard	0.070 ppm	39	21	31	34	23
Carbon Monoxide – Reseda Monitoring Station						
Highest 8-Hour Average (ppm)[b]		2.70	*	*	*	*
Days over National Standard	9.0 ppm	0	*	*	*	*
Days over State Standard	9.0 ppm	0	*	*	*	*
Nitrogen Dioxide – Reseda Station						
Highest 1-Hour Average (ppm)[b]		0.071	0.058	0.059	0.073	0.056
Days over National Standard	0.10 ppm	0	0	0	0	0
Days over State Standard	0.18 ppm	0	0	0	0	0
Annual Average (ppm)[b]		*	*	*	0.013	0.013
Days over National Standard	0.053 ppm	*	*	*	0	0
Days over State Standard	0.03 ppm	*	*	*	0	0
Particulate Matter (PM_{10}) – Santa Clarita Station						
Highest 24-Hour Average ($\mu g/m^3$)[c]		37.0	43.0	47.0	41.0	96.0
Days over National Standard (measured)	150 $\mu g/m^3$	0	0	0	0	0
Days over State Standard (measured)	50 $\mu g/m^3$	0	0	0	0	*
Annual Average ($\mu g/m^3$)	20 $\mu g/m^3$	*	20.6	22.1	*	*
Particulate Matter ($PM_{2.5}$) – Reseda Monitoring						
Highest 24-Hour Average ($\mu g/m3$)[d]		41.6	41.8	27.2	36.8	24.4
Days over National Standard (measured)	35 $\mu g/m3$	2	1	0	1	0
Annual Average ($\mu g/m3$)	12 $\mu g/m3$	10.4	9.8	*	8.8	*

ppm = parts per million; $\mu g/m3$ = micrograms per cubic meter.

* Data is not available for that year. For CO, specifically, monitoring at the Reseda station stopped in 2012.

a Generally, state standards and national standards are not to be exceeded more than once per year.

b The highest average reported is the 1st highest average for State and National. The days over standard for national and state are based on different criteria and therefore may be different even though the standards are the same.

c Concentrations and averages represent federal statistics. State and federal statistics may differ because of different sampling methods.

d Concentrations and averages represent state statistics. State and federal statistics may differ because of different sampling methods.

SOURCE: CARB, 2017.

TABLE 4.2-4
AIR BASIN ATTAINMENT STATUS

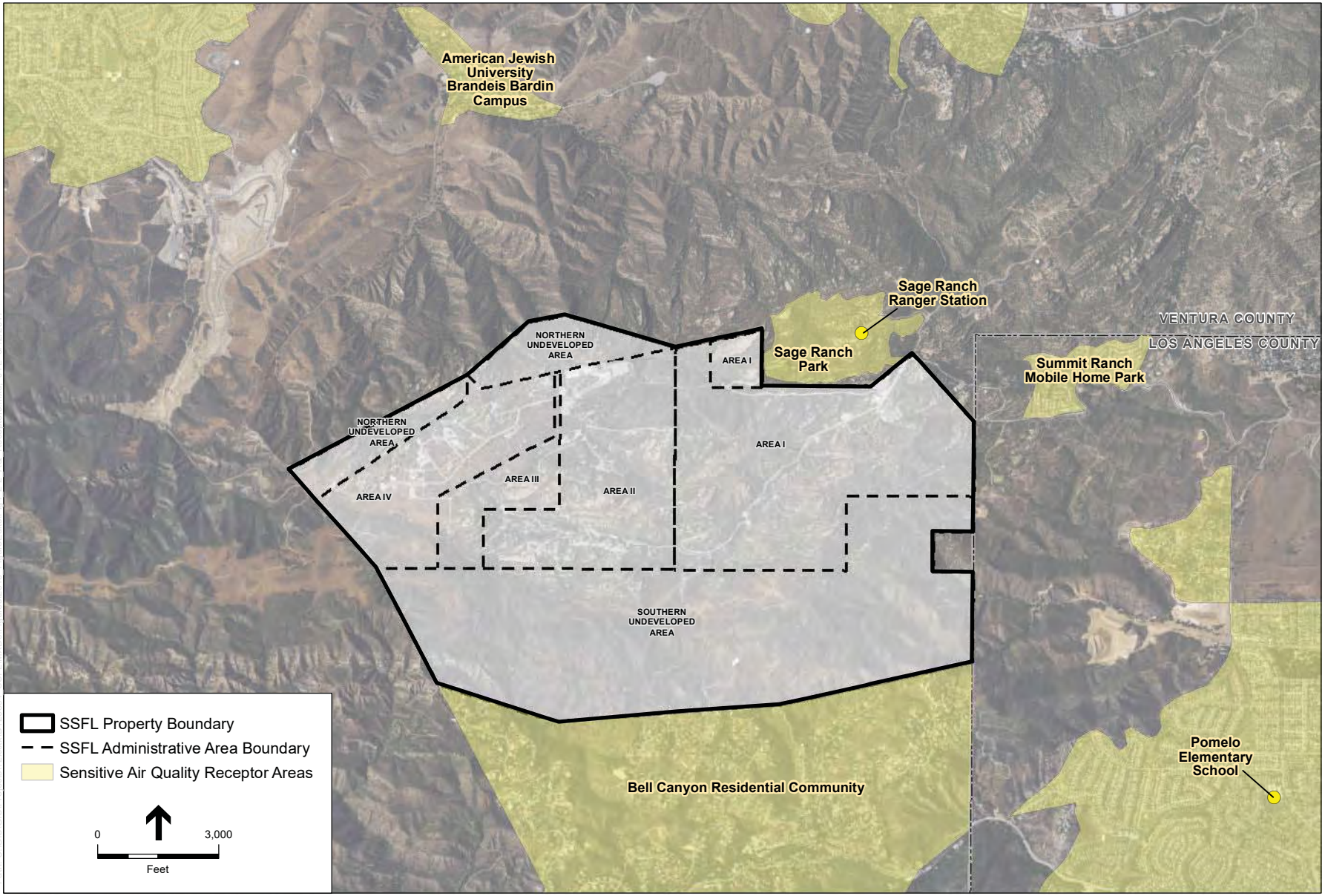
	Attainment Status	
Pollutant	**California Standards**	**Federal Standards**
SCCAB (Ventura County)		
Ozone	Nonattainment	Serious Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
PM_{10}	Nonattainment	Attainment
$PM_{2.5}$	Attainment	Attainment
Lead	Attainment	Attainment
SCAB		
Ozone	Nonattainment	Extreme Nonattainment
CO	Attainment	Unclassified/Attainment
NO_2	Attainment	Unclassified/Attainment
SO_2	Attainment	Attainment
PM_{10}	Nonattainment	Attainment
$PM_{2.5}$	Nonattainment	Moderate Nonattainment
Lead	Attainment	Nonattainment

SOURCE: CARB, 2015a; USEPA, 2016b.

Sensitive Land Uses

Land uses such as schools, children's daycare centers, hospitals, and convalescent homes are considered to be more sensitive to poor air quality than the general public because the population groups associated with these uses have increased susceptibility to respiratory distress. In addition, residential uses are considered more sensitive to air quality conditions than commercial and industrial uses because people generally spend longer periods of time at their residences, resulting in greater exposure to ambient air quality conditions. Recreational land uses are considered moderately sensitive to air pollution. Exercise places a high demand on respiratory functions, which can be impaired by air pollution, even though exposure periods during exercise are generally short. In addition, noticeable air pollution can detract from the enjoyment of recreation (CARB, 2005a).

Currently, sensitive receptors in the project vicinity include the park ranger's house in Sage Ranch Park, located adjacent to the project site within Ventura County, residential communities located approximately a mile north of the site; residences located 0.3 mile east of the site; and residences in Bell Canyon located directly south of the project site (see **Figure 4.2-2**). The Bell Canyon residences are approximately 0.5 mile from the nearest areas of onsite disturbance. Scattered residences are also located approximately a mile west of the proposed project site.



Source: ESA, ESRI

Santa Susana Field Laboratory

Figure 4.2-2

Closest Sensitive Air Quality Receptors

The nearest school (non-university) is the Pomelo Elementary School located approximately 1.5 miles from the project site. In addition to the onsite construction activities, several routes are proposed to carry materials from the project site to various disposal sites throughout the United States. There are residential and school receptors adjacent to all of these routes.

4.2.2 Regulatory Setting

4.2.2.1 Federal

Clean Air Act

The Clean Air Act (CAA) establishes NAAQS and specifies future dates for achieving compliance. The CAA also mandates that the state submit and implement a State Implementation Plan (SIP) for local areas not meeting those standards. The plans must include pollution control measures that demonstrate how the standards would be met.

The 1990 amendments to the CAA identify specific emission-reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or meet interim milestones. Title I provisions were established with the goal of attaining the NAAQS for criteria pollutants. **Table 4.2-5** shows the NAAQS currently in effect for each criteria pollutant. The CAAQS (discussed in the following pages) also are provided for reference.

TABLE 4.2-5
AMBIENT AIR QUALITY STANDARDS FOR CRITERIA POLLUTANTS

Pollutant	Averaging Time[a]	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 hour	0.09 ppm	---	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when ROG and NO_X react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial/industrial mobile equipment.
	8 hours	0.07 ppm[b]	0.070 ppm		
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9.0 ppm		
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm	0.100 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.
	Annual Arithmetic Mean	0.030 ppm	0.053 ppm		
Sulfur Dioxide (SO_2)	1 hour	0.25 ppm	75 ppb	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	3 hours	---	0.50 ppm		
	24 hours	0.04 ppm	0.14 ppm		
	Annual Arithmetic Mean	---	0.03 ppm		
Respirable	24 hours	50 µg/m^3	150 µg/m^3	May irritate eyes and respiratory	Dust and fume-producing

Pollutant	Averaging Time[a]	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	---	tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
Fine Particulate Matter ($PM_{2.5}$)	24 hours	---	35 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NO_X, sulfur oxides, and organics.
	Annual Arithmetic Mean	12 µg/m^3	12 µg/m^3		
Lead (Pb)	30 Day Average	1.5 µg/m^3	---	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction (in severe cases).	*Present source:* lead smelters, battery manufacturing and recycling facilities. Past source: combustion of leaded gasoline.
	Calendar Quarter	---	1.5 µg/m^3		
	Rolling 3-Month Average	---	0.15 µg/m^3		
Hydrogen Sulfide	1 hour	0.03 ppm	No National Standard	Nuisance odor (rotten egg smell), headache and breathing difficulties (higher concentrations)	Geothermal power plants, petroleum production and refining
Sulfates (SO_4)	24 hour	25 µg/m^3	No National Standard	Decrease in ventilatory functions; aggravation of asthmatic symptoms; aggravation of cardio-pulmonary disease; vegetation damage; degradation of visibility; property damage.	Industrial processes.
Visibility Reducing Particles	8 hour	Extinction of 0.23/km; visibility of 10 miles or more	No National Standard	Reduces visibility, reduced airport safety, lower real estate value, and discourages tourism.	See $PM_{2.5}$.
Vinyl Chloride	24 hour	0.01 ppm	No National Standard	Short-term exposure to high levels of vinyl chloride in the air can cause dizziness, drowsiness, and headaches. Long-term exposure through inhalation and oral exposure can cause liver damage. Cancer is a major concern from exposure to vinyl chloride via inhalation. Vinyl chloride exposure has been shown to increase the risk of angiosarcoma, a rare form of liver cancer in humans.	Polyvinyl chloride (PVC) plastic and vinyl products.

NOTE: ppm = parts per million; ppb = parts per billion; µg/m^3 = micrograms per cubic meter.

[a] The averaging time is the interval of time over which the sample results are reported.

[b] This concentration was approved by CARB on April 28, 2005 and became effective May 17, 2006.

SOURCE: CARB, 2016.

General Conformity Analysis

Portions of this project may be subject to the requirements of the federal General Conformity regulation. Conformity is defined in the CAA as conformity to an air quality implementation plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards, exacerbate existing violations, or interfere with timely attainment or required interim emission reductions towards attainment. Section 176(c) of the CAA requires the USEPA to develop criteria and procedures for determining the conformity of transportation and non-transportation (general) projects that require federal agency approval or funding with the applicable air quality plan. For projects that have a federal component, a project would need a General Conformity analysis if the annual emissions generated by the project exceed the General Conformity *de minimus* thresholds. If these thresholds are exceeded, General Conformity Rule compliance can be demonstrated in one of the following ways:

1. Reducing emissions to below the General Conformity *de minimis* thresholds;
2. Showing that emissions are included in the area's emission budget for the SIP;
3. Demonstrate that the State will include the emissions in the area's SIP emissions budget and the budget will not be exceeded;
4. Implement project emission offsets for each year the General Conformity *de minimis* thresholds are exceeded;
5. Conduct air quality modeling to demonstrate the project would not cause or exacerbate a violation or exceedance of a national ambient air quality standard.

Compliance with the General Conformity Rule must be demonstrated prior to commencing construction activities. For the project, both the DOE and NASA portions of the clean-up activities require a federal action and therefore may be required to conduct a General Conformity Analysis. Boeing is not subject to the General Conformity Rule as there is no accompanying federal action.

Nonroad Diesel Rule

USEPA established a series of increasingly strict emission standards for new off-road diesel equipment, on-road diesel trucks, and harbor craft. New construction equipment used for the project, including heavy-duty trucks, off-road construction equipment would be required to comply with the emission standards.

4.2.2.2 State

California Air Resources Board

CARB, a board under the California Environmental Protection Agency, oversees air quality planning and control throughout California. CARB is responsible for coordination and oversight of state and local air pollution control programs in California and for implementation of the CCAA. The CCAA, which was adopted in 1988, requires CARB to establish the CAAQS. CARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing

particulate matter, and the above-mentioned criteria air pollutants. Applicable CAAQS are shown in Table 4.2-5.

CARB's other responsibilities include overseeing compliance by local air districts with California and federal laws; approving local air quality plans; submitting SIPs to USEPA; monitoring air quality; determining and updating area designations and maps; adopting measures and regulations for control of emissions of toxic air contaminants and portable equipment operated within the state, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels. CARB is also responsible for implementation of AB 32 *California Global Warming Solutions Act of 2006* and for state emissions reductions. See Section 4.6 *Greenhouse Gas,* for more information regarding CARB's responsibility with respect to climate change and greenhouse gas emissions.

California Clean Air Act

The California Clean Air Act (CCAA) requires all air districts in the state to endeavor to meet the CAAQS by the earliest practical date. Unlike the federal CAA, the CCAA does not set precise attainment deadlines. Instead, the CCAA establishes increasingly stringent requirements for areas that will require more time to achieve the standards. CAAQS are generally more stringent than the NAAQS and incorporate additional standards for sulfates, hydrogen sulfide, visibility-reducing particles, and vinyl chloride. The CAAQS and NAAQS are listed together in Table 4.2-5.

The CARB and local air districts are responsible for achieving California's air quality standards, which are to be achieved through district-level air quality management plans that would be incorporated into the SIP. In California, USEPA has delegated authority to prepare SIPs to CARB, which in turn has delegated that authority to individual air districts. CARB traditionally has established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles and toxic sources, developing air emission inventories, collecting air quality and meteorological data, and approving SIPs.

The CCAA substantially adds to the authority and responsibilities of air districts. The CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The CCAA also emphasizes the control of "indirect and area-wide sources" of air pollutant emissions. The CCAA gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures (TCMs).

State Tailpipe Emission Standards

To reduce emissions from off-road diesel equipment, on-road diesel trucks, and harbor craft, CARB established a series of increasingly strict emission standards for new engines. New construction equipment used for the project, potentially including heavy-duty trucks, off-road construction equipment, would be required to comply with the standards.

Toxic Air Containments

See TAC discussion in Section 4.2.1.2.

California Green Building Standard Code

The proposed project is a remediation project that does not include the construction of buildings. Therefore, the California Green Building Standard is not applicable to the project.

Assembly Bill 1092

The proposed project is a remediation project that does not include the construction of buildings. Therefore, Assembly Bill 1092 is not applicable to the project.

On-Road Heavy-Duty Diesel Vehicles (In Use) Regulation

On December 12, 2008, CARB approved the on-road heavy-duty diesel vehicle (in use) regulation to significantly reduce particulate matter and NO_X emissions from existing diesel vehicles operating in California. The regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. The regulation applies to nearly all diesel-fueled trucks and buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds that are privately or federally owned and for privately and publicly owned school buses. Other public fleets, solid-waste collection trucks, and transit buses are already subject to other regulations and are not part of the truck and bus regulation.

On January 1, 2012, the regulation implemented phase-in requirements for heavier trucks to reduce particulate matter emissions with exhaust retrofit filters that capture pollutants before they are emitted to the air or by replacing vehicles with newer vehicles that are originally equipped with PM filters. Starting on January 1, 2015, lighter trucks with a GVWR of 14,001 to 26,000 pounds with engines that are 20 years or older would need to be replaced with newer trucks. Starting January 1, 2020, all remaining trucks and buses would need to be replaced so that they would all have 2010 model year engines or equivalent emissions by 2023.

Off-Road Diesel Fleet Regulation

On July 26, 2007, CARB adopted this regulation to reduce diesel particulate matter and NO_X emissions from existing off-road heavy-duty diesel vehicles in California that are used in construction, mining, and industrial operations. The Off-Road Diesel Fleet Regulation does the following:

- Imposes limits on idling, requires a written idling policy, and requires a disclosure when selling vehicles.
- Requires all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System) and labeled.
- Restricts the adding of older vehicles into fleets.
- Requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (i.e., exhaust retrofits).

The Off-Road Diesel Fleet Regulation applies to all self-propelled off-road diesel vehicles over 25 horsepower (hp) used in California and most two-engine vehicles (except on-road two-engine sweepers). The regulation does not apply to stationary equipment or portable equipment, such as generators. Vehicles that are exempt from this regulation include personal-use vehicles, vehicles used solely for agriculture, vehicles that are awaiting sale, emergency operations vehicles, dedicated snow-removal vehicles, low-use vehicles (used under 200 hours per year), and vehicles that are already covered by the Regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards (Cargo Handling regulation). The off-road performance requirements are applied to a fleet as a whole and not to individual vehicles, and are based on a fleet's average NO_X emissions. The goal of the regulation is to encourage fleet owners to replace a certain percentage of their diesel fleet over time with cleaner-emitting vehicles in order to meet the lower annual NO_X limits.

The regulation was amended in December 2010 to provide a 4-year delay from the original compliance timeline for all fleets. By January of each year, starting in 2014, each fleet must meet the fleet average NO_X requirements or, as an alternative, a specified percentage of the fleet must be replaced with newer engines.

4.2.2.3 Regional

Ventura County Air Pollution Control District

VCAPCD attains and maintains air quality conditions in the SCCAB through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of VCAPCD includes preparation of plans for attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. VCAPCD also inspects stationary sources of air pollution and responds to citizen complaints; monitors ambient air quality and meteorological conditions; and implements programs and regulations required by the CAA, Clean Air Act Amendments (CAAA), and CCAA. Air quality plans applicable to the proposed project are discussed below.

Air Quality Management Plan

The VCAPCD and Southern California Association of Governments (SCAG) are responsible for preparing the air quality management plan (AQMP), which addresses federal and state CAA requirements. The AQMP details goals, policies, and programs for improving air quality in the SCCAB. The VCAPCD prepared its first AQMP in 1982 in response to the CCAA, and the AQMP has been updated regularly since.

The VCAPCD released the current Final 2007 AQMP, which was adopted in May 2008 and approved by CARB and submitted to the USEPA as part of the amendment to the SIP in June of 2008. Based on the 2007 AQMP, Ventura County was anticipated to meet the federal 8-hour attainment standards by 2013; however, as of 2015, Ventura County is listed as being in Serious Nonattainment for all of Ventura County, excluding the Channel Islands of Anacapa and San Nicholas Islands (USEPA, 2016b). Additionally, the federal standard was changed in 2015 to

make it more stringent and therefore additional reductions would need to occur within Ventura County to not only meet the previous 2008 standard, but also the revised 2015 federal standard.

The District adopted the 2016 Ventura County Air Quality Management Plan on February 14, 2017. The 2016 AQMP presents Ventura County's strategy (including related mandated elements) to attain the 2008 federal 8-hour ozone standard by 2020, as required by the federal Clean Air Act Amendments of 1990 and applicable USEPA clean air regulations. Ventura County is anticipated to attain the 2008 federal 8-hour ozone standard, using local, state, and federal clean air programs.

VCAPCD Rules and Regulations

Rule 10 – Permit Required: Originally adopted in 1968 and revised most recently in April of 2004, Rule 10 requires that an "Authority to Construct" be obtained prior to building, erecting, installing, modifying, relocating, or replacing any emissions units at a stationary source (VCAPCD, 2004a).

Rule 50 – Opacity: Originally adopted in 1968 and revised most recently in April of 2005, Rule 50 prohibits the discharge into the atmosphere from a single source any air contaminants for a period or periods aggregating more than 3 minutes in 1 hour: (1) as dark or darker in shades as that is designated as No.1 on the Ringelmann Chart, as published by the United States Bureau of Mines; or (2) of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke as described previously in requirement 1 (VCAPCD, 2004b).

Rule 51 – Nuisance: Originally adopted in 1968 and revised most recently in April 2004, Rule 51 prohibits the discharge of air contaminants from any source in quantities that could cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endangers the comfort, repose, health or safety of any such persons or the public; or that cause or have a natural tendency to cause injury or damage to business or property (VCAPCD, 2004c).

Rule 55 – Fugitive Dust: Adopted on June 10, 2008, Rule 55 applies to any operation, disturbed surface area, or man-made condition capable of generating fugitive dust, including demolition, construction, storage piles, unpaved roads, track-out, and earth-moving. The key provisions of Rule 55 include: (1) visible dust from an applicable source is prohibited or limited; (2) measures must be taken to reduce or prevent track-out onto paved public roadways from an applicable source; (3) track-out must be removed from roadways; (4) visible dust exceeding 100 feet in length from earth-moving activities is prohibited; (5) bulk material handling facilities with a monthly import or export of 2,150 cubic yards or more of bulk materials must take measures to reduce or prevent track-out onto a paved public road: and (6) outbound trucks with bulk materials or soil must either be tarped, have a 6-inch freeboard below the rim of the truck bed, or be wetted or treated to minimize the loss of materials to wind or spillage (VCAPCD, 2008). The following fugitive dust reduction measures are required for all construction projects (VCAPCD, 2003):

- The area disturbed by clearing, grading, earth-moving, or excavation operations shall be minimized to prevent excessive amounts of dust.

- Pre-grading/excavation activities shall include watering the area to be graded or excavated before commencement of grading or excavation operations. Application of water (preferably reclaimed, if available) should penetrate sufficiently to minimize fugitive dust during grading activities.
- Fugitive dust produced during grading, excavation, and construction activities shall be controlled by the following activities:
  - All trucks shall be required to cover their loads as required by California Vehicle Code Section 23114
  - All graded and excavated material, exposed soil areas, and active portions of the construction site, including unpaved onsite roadways, shall be treated to prevent fugitive dust. Treatment shall include, but not necessarily be limited to, periodic watering, application of environmentally-safe soil stabilization materials, and/or roll-compaction as appropriate. Watering shall be done as often as necessary and reclaimed water shall be used whenever possible.
- Graded and/or excavated inactive areas of the construction site shall be monitored by the construction manager at least weekly for dust stabilization. Soil stabilization methods, such as water and roll-compaction, and environmentally-safe dust control materials, shall be periodically applied to portions of the construction site that are inactive for over 4 days. If no further grading or excavation operations are planned for the area, the area should be seeded and watered until grass growth is evident, or periodically treated with environmentally safe dust suppressants, to prevent excessive fugitive dust.
- Signs shall be posted onsite to limit traffic to 15 miles per hour or less.
- During periods of high winds (i.e., wind speeds sufficient to cause fugitive dust to impact adjacent properties), all clearing, grading, earth moving, and excavation operations shall be curtailed to the degree necessary to prevent fugitive dust created by onsite activities and operations from being a nuisance or hazard, either offsite or onsite. The site superintendent/supervisor shall use his/her discretion in conjunction with the APCD in determining when winds are excessive.
- Adjacent streets and roads shall be swept at least once per day, preferably at the end of the day, if visible soil material is carried over to adjacent streets and roads.
- Personnel involved in grading operations, including contractors and subcontractors, should be advised to wear respiratory protection in accordance with California Division of Safety and Health regulations.

Rule 74.29 –Soil Decontamination Operations: Adopted on October 10, 1995, Rule 74.29 applies to soils that contain gasoline, diesel fuel, or jet fuel. The key provisions of Rule 74.29 include: (1) conditions on aeration of sols containing these fuels; (2) required VOC monitoring during excavation activities; (3) VOC monitoring during remediation activities; (4) requirements for active storage piles; (5) requirements for inactive storage piles: and (6) requirements for transport of contaminated soils (VCAPCD, 1995).

Reactive Organic Compounds (ROC) and NO_X Construction Reduction Measures: Ozone precursor emissions from construction vehicles can be substantial. However, there are few feasible measures available to reduce these emissions. While there are some NOx credits

available through the RECLAIM program, the project is not eligible to participate because it is not a source covered by the program rules. VCAPCD requires the following measures to mitigate ozone precursor emissions from construction motor vehicles when emissions exceed 25 pounds per day (VCAPCD, 2003):

- Minimize equipment idling time.
- Maintain equipment engines in good condition and in proper tune as per manufacturer's specifications.
- Lengthen the construction period during smog season (May through October), to minimize the number of vehicles and equipment operating at the same time.
- Use alternatively fueled construction equipment, such as compressed natural gas (CNG), liquefied natural gas (LNG), or electric, if feasible.

Valley Fever Reduction Measures: If the project site poses a risk for Valley Fever, VCAPCD recommends that the lead agency include appropriate Valley Fever reduction measures. These include the fugitive dust control measures identified above, along with the following during project construction (VCAPCD, 2003):

- Restrict employment to persons with positive *coccidioidin* skin tests (since those with positive tests can be considered immune to reinfection), where possible.
- Hire crews from local populations where possible, since it is more likely that they have been previously exposed to the fungus and are therefore immune.
- Require crews to use respirators during project clearing, grading, and excavation operations in accordance with California Division of Occupational Safety and Health regulations.
- Require that the cabs of grading and construction equipment be air-conditioned.
- Require crews to work upwind from excavation sites.
- Pave construction roads.
- Where acceptable to the fire department, control weed growth by mowing instead of discing, thereby leaving the ground undisturbed and with a mulch covering.
- During rough grading and construction, the access way into the project site from the adjoining paved roadways should be paved or treated with environmentally-safe dust control agents.

South Coast Air Quality Management District

Criteria Air Pollutants

SCAQMD attains and maintains air quality conditions in the SCAB through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of SCAQMD includes preparation of plans for attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. SCAQMD also inspects stationary sources of air pollution and responds to citizen complaints; monitors ambient air quality and meteorological conditions; and implements programs and regulations required by the federal Clean Air Act, CAAA, and CCAA.

Air Quality Management Plan

SCAQMD and the SCAG are responsible for preparing the AQMP, which addresses federal and state Clean Air Act requirements. The AQMP details goals, policies, and programs for improving air quality in the SCAB.

The 2012 AQMP was adopted by the SCAQMD Governing Board on December 12, 2012. The purpose of the 2012 AQMP for the SCAB is to set forth a comprehensive and integrated program to lead the region into compliance with the federal 24-hour $PM_{2.5}$ air quality standard, and to provide an update to the SCAB's commitment toward meeting the federal 8-hour ozone standards (SCAQMD, 2013). The AQMP also serves to satisfy recent USEPA requirements for a new attainment demonstration of the revoked 1-hour ozone standard, as well as a vehicle miles traveled (VMT) emissions offset demonstration.[3] Specifically, the AQMP served as the official SIP submittal for the federal 2006 24-hour $PM_{2.5}$ standard, for which USEPA had established a due date of December 14, 2012.[4] In addition, the AQMP updated specific new control measures and commitments for emissions reductions to implement the attainment strategy for the 8-hour ozone SIP. The 2012 AQMP set forth programs that require integrated planning efforts and the cooperation of all levels of government: local, regional, state, and federal.

The 2016 AQMP was adopted by the District on March 3, 2017 and by CARB on March 23, 2017. The 2016 AQMP will focus on available, proven, and cost effective alternatives to traditional strategies. In particular, focus will be on reducing mobile source emissions as they are the principal contributors to the current pollution levels within the SCAB. Further, the 2016 AQMP promotes encouraging the accelerated transition of vehicles, buildings, and industrial facilities to cleaner technologies (SCAQMD, 2016a). While the 2016 AQMP was adopted by the SCAQMD, it has not yet received USEPA approval. Therefore, until such time as the 2016 AQMP is approved by the USEPA, the 2012 AQMP remains the applicable AQMP.

SCAQMD Rules and Regulations

All projects are subject to SCAQMD rules and regulations in effect at the time of construction. SSFL is located outside SCAQMD jurisdiction, therefore, activities at SSFL are not subject to SCAQMD rules and regulations, however, the trucks hauling waste from SSFL or delivering backfill to SSFL may travel through SCAQMD. Specific rules applicable to the construction anticipated under the proposed project, if occurs in SCAQMD, would include the following:

[3] Although the federal 1-hour ozone standard was revoked in 2005, the USEPA has proposed to require a new 1-hour ozone attainment demonstration in the South Coast extreme ozone nonattainment area as a result of a recent court decision. Although USEPA has replaced the 1-hour ozone standard with a more health protective 8-hour standard, the federal Clean Air Act anti-backsliding provisions require that California have approved plans for attaining the 1-hour standard.

[4] Although the 2012 AQMP was approved by the SCAQMD Board on December 7, 2012, the plan was not submitted to the USEPA by December 14, 2012 as it first required approval from CARB. The 2012 AQMP was subsequently approved by CARB on January 25, 2013, and as of February 13, 2013 the plan was submitted by CARB to the USEPA.

Rule 401 – Visible Emissions: While the project would result in fugitive dust emissions during remediation activities, the project is located within the VCAPCD jurisdiction and therefore the SCAQMD rules for fugitive dust, including visible emissions, are not relevant to the project.

Rule 402 – Nuisance: A person shall not discharge from any source whatsoever such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health, or safety of any such persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property. The provisions of this rule do not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals (SCAQMD, 1976).

Rule 403 – Fugitive Dust: While the project would result in fugitive dust emissions during remediation activities, the project is located within the VCAPCD jurisdiction and therefore the SCAQMD rules for fugitive dust, including visible emissions, is not relevant to the project.

Rule 1166 – VOC Emissions from Decontamination of Soil. This rule sets requirements to control the emission of volatile organic compounds (VOCs) from excavation, grading, handling, and treating of VOC contaminated soils. This rule outlines the requirements for: (a) excavating or grading soils contaminated with VOCs from an underground storage tank or transfer piping; (b) handling VOC contaminated soils; (c) measures to be taken if VOC concentrations exceed 1,000 ppm; (d) treating contaminated soil; (e) maintaining VOCs in the soil and not letting them escape to the ambient air during excavation, transportation, or treatment of soils; and (f) loading trucks with contaminated soils (SCAQMD, 2001). Rule 1166 is applicable to the transportation of VOC soils through the SCAB.

Rule 1466 – Control of Particulate Emissions from Soils with Toxic Air Contaminants: This rule sets requirements to minimize the amount of fugitive dust containing toxic air contaminants that is emitted during earth-moving activities, including, excavating, grading, handling, treating, stockpiling, transferring, and removing soil that contains applicable TACs. Rule 1166 is applicable to the transportation of soils with applicable TACs through the SCAB. Applicable requirements include covering the truck loads for soil that contains applicable TACs.

Toxic Air Contaminants

In addition to the TAC description in 4.2.1.2, SCAQMD's Air Toxics Control Plan (March 2000, revised March 26, 2004) is a planning document designed to examine the overall direction of SCAQMD's air toxics control program. It includes development and implementation of strategic initiatives to monitor and control air toxics emissions. Control strategies that are deemed viable and are within SCAQMD's jurisdiction will each be brought to the SCAQMD Board for further consideration through the normal public review process. Strategies that are to be implemented by other agencies will be developed in a cooperative effort, and the progress will be reported back to the Board periodically.

In May 2015, the SCAQMD completed the Multiple Air Toxics Exposure Study IV (MATES IV) MATES IV is a monitoring and evaluation study conducted in the SCAB and is a follow-up to

previous air toxics studies. The study is a follow-up to the 2008 MATES III study and consists of several elements, including a monitoring program, an updated emissions inventory of toxic air contaminants, and a modeling effort to characterize risk across the SCAB. The study focuses on the carcinogenic risk from exposure to air toxics. However, it does not estimate mortality or other health effects from particulate exposures. MATES IV shows that the region adjacent to the project site area has an estimated carcinogenic risk of up to 370.93 in a million (SCAQMD, 2015a). These model estimates were based on monitoring data collected at 10 fixed sites within the SCAB.

4.2.2.4 Local

The project site is located within the County of Ventura. The local roadway network used by the project's trucks to access the SSFL site along with some of the offsite sensitive uses that could potentially be affected by the project's pollutant levels are located in both the County of Los Angeles and City of Los Angeles. Accordingly, the plans, policies, and standards from these relevant jurisdictions have also been taken into consideration in this analysis.

Ventura County General Plan

The following policies from the Ventura County General Plan are relevant to the proposed project:[5]

Air Quality

1.2.2.1: Discretionary development that is inconsistent with the Air Quality Management Plan (AQMP) shall be prohibited, unless overriding considerations are cited by the decision-making body.

1.2.2.2: The air quality impacts of discretionary development shall be evaluated by use of the Guidelines for the Preparation of Air Quality Impact Analysis.

1.2.2.3: Discretionary development that would have a significant adverse air quality impact shall only be approved if it is conditioned with all reasonable mitigation measures to avoid, minimize or compensate (offset) for the air quality impact. Developers shall be encouraged to employ innovative methods and technologies to minimize air pollution impacts.

1.2.2.5: Development subject to Air Pollution Control District (APCD) permit authority shall comply with all applicable APCD rules and permit requirements, including the use of best available control technology (BACT) as determined by the APCD.

County of Los Angeles General Plan

The following policies from the Los Angeles County General Plan are relevant to the proposed project**:**

[5] While the overall site cleanup is not a development project, the policies in the General Plan that are identified have been taken into consideration for the project.

General Goals and Policies

Policy 14: Restore and protect air quality through the control of industrial and vehicular emissions, improved land use management, energy conservation and transportation planning.

Land Use Element

Policy 24: Promote compatible land use arrangements that reduce reliance on the private automobile in order to minimize related social, economic and environmental costs.

Conservation and Open Space Element

Policy 1: Actively support strict air quality regulations for mobile and stationary sources, and continued research to improve air quality. Promote vanpooling, carpooling and improved public transportation.

City of Los Angeles General Plan

The following goals from the Air Quality Element of the 1992 City of Los Angeles General Plan pertain to the proposed project:

Goal 1: Good air quality and mobility in an environment of continued population growth and healthy economic structure;

Goal 2: Less reliance on single occupant vehicles with fewer commute and non-work trips;

Goal 4: Minimal impact of existing land use patterns and future land use development on air quality by addressing the relationship between land use, transportation, and air quality;

City of Simi Valley General Plan

The following policies from the Natural Resources Element of the 2012 City of Simi Valley 2030 General Plan Update pertain to the proposed project:

NR-9.1: Regional Cooperation. Ensure that air quality standards are consistent with the countywide recommendations of the Ventura County Air Pollution Control District, which are intended to reduce air quality impacts. In addition, cooperate with the Southern California Association of Government's efforts to implement provisions of the region's Air Quality Management Plan.

NR-9.3: Improved Technology. Promote and implement state and federal regulations that improve transportation technology, vehicle mileage performance, and cleaner fuels.

NR-9.4: Contractors. Require that government contractors minimize greenhouse gas emissions in building construction, operations, etc. For example, contractors can use low or zero-emission vehicles and equipment.

4.2.3 Thresholds of Significance

For the purposes of this PEIR, DTSC has used the checklist questions in Appendix G of the CEQA Guidelines as thresholds of significance to determine whether the project would have a significant environmental impact regarding air quality. Based on the size and scope of the project and the potential for air quality impacts, the criteria identified below are included for evaluation in this PEIR:

Would the project:

4.2-1 Conflict with or obstruct implementation of the applicable air quality plan (refer to Impact Statements 4.2-1a and 4.2-1b)?

4.2-2 Violate any air quality standard or contribute substantially to an existing or projected air quality violation (refer to Impact Statements 4.2-2a and 4.2-2b)?

4.2-3 Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors) (refer to Impact Statements 4.2-3a and 4.2-3b)?

4.2-4 Expose sensitive receptors to substantial pollutant concentrations (refer to Impact Statements 4.2-4a and 4.2-4b)?

4.2-5 Create objectionable odors affecting a substantial number of people (refer to Impact Statements 4.2-5a and 4.2-5b)?

The CEQA Guidelines (Section 15064.7) provide that, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts. The potential air quality impacts of the project are, therefore, evaluated according to thresholds developed by VCAPCD in the Ventura County Air Quality Assessment Guidelines (VCAPCD, 2003) and subsequent guidance discussed below. The potential air quality impacts are also evaluated according to the thresholds developed by SCAQMD in the *CEQA Air Quality Handbook, Air Quality Analysis Guidance Handbook* (SCAQMD, 2015b). These thresholds generally incorporate the checklist questions contained in Appendix G of the CEQA Guidelines. **Table 4.2-6** identifies the air quality significance thresholds by air district. While the activities associated with the proposed project (for both overall and initial clean-up activities) are consistent with construction related emissions sources, because the project has a fifteen-year duration the longevity of the project is more consistent with operational activities. Therefore, with respect to both the VCAPCD and SCAQMD thresholds, the project emissions are compared to the operational thresholds.

In addition to regional emissions criteria, the SCAQMD has criteria in place to determine whether construction activities would create significant adverse localized air quality impacts on nearby sensitive receptors (VCAPCD does not have equivalent criteria). These are the SCAQMD's Localized Significance Thresholds (LSTs). The LSTs developed by SCAQMD are based on the pounds of emissions per day that can be generated by a project without causing or contributing to adverse localized air quality impacts, and only applies to the following criteria pollutants: CO, NO_X, PM_{10}, and $PM_{2.5}$. The analysis of localized air quality impacts focuses only on the onsite activities of a project, and does not include emissions that are generated offsite such as from on-road or delivery truck trips (SCAQMD, 2003a). The SCAQMD's thresholds are based on the location within the region as well as the distance to the nearest sensitive receptor and the area of disturbance. The proposed project is adjacent to the West San Fernando Valley region and

therefore the thresholds for the West San Fernando Valley are used in determining localized significance.

TABLE 4.2-6
REGIONAL AIR QUALITY SIGNIFICANCE THRESHOLDS

	Mass Daily Thresholds	
Pollutant	**Construction**	**Operations**
VCAPCD[1] (lbs/day)		
Oxides of Nitrogen (NO_X)	25	25
Reactive Organic Compounds (ROC)	25	25
Carbon Monoxide (CO)	Exceedance of state or federal standards	
Cumulative AQMP Consistency	A project that has less than 2 lbs per day of ROC or NO_X is considered consistent with the AQMP and further assessment is not necessary. A project that has more than 2 lbs per day of ROC or NOX require an assessment of AQMP consistency, as directed in the AQMP.	
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million people Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million people) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	
SCAQMD[2] (lbs/day)		
Oxides of Nitrogen (NO_X)	100	55
Volatile Organic Compounds (VOC)	75	55
Respirable Particulate Matter (PM_{10})	150	150
Fine Particulate Matter ($PM_{2.5}$)	55	55
Oxides of Sulfur (SO_X)	150	150
Carbon Monoxide (CO)	550	550
TACs (including carcinogens and non-carcinogens	Maximum Incremental Cancer Risk ≥ 10 in 1 million people Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million people) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	

Source:
[1] VCAPCD, 2003.
[2] SCAQMD, 2015b.
As the proposed project would not involve the development of any major lead emissions sources, lead emissions would not be analyzed further in this report

Note that while the onsite emissions do not occur within the SCAQMD's jurisdiction, there are sensitive receptors that are within the SCAQMD's jurisdiction and, due to proximity, could potentially be impacted by onsite activities. Thus, an analysis consistent with SCAQMD guidance

has been conducted. For the purpose of analyzing localized air quality impacts, SCAQMD has developed LSTs for three project site sizes: 1 acre, 2 acres, and 5 acres. The LSTs established for each of the aforementioned site acreages represent the amount of pollutant emissions that would not exceed the most stringent applicable federal or state ambient air quality standards. To determine the emissions thresholds to compare the project against, the SCAQMD has determined the amount of disturbance per day based on equipment usage. The given equipment list results in up to 4.5 acres of disturbance per administration area. SCAQMD's methodology and a detailed equipment list are included in Appendix D of this report.

The closest sensitive receptors within SCAQMD's jurisdiction are approximately 482 meters from the project boundary, and the actual work is scattered throughout the entire site. Therefore, as a conservative assessment, the total onsite emissions are compared to the LSTs for a 2-acre site at 400 meters. Under conditions where the project's onsite construction emissions, implementing appropriate mitigation, would exceed the LSTs for a 2-acre site, air dispersion modeling (Using AERMOD or AERSCREEN) would be required to evaluate the potential for construction impacts on localized sensitive receptors. However, under conditions where it is determined that the project's peak onsite daily construction emissions would not exceed the LSTs for a 2-acre site, it can be concluded that the project's construction emissions would not result in any adverse localized air quality impacts on its surrounding offsite sensitive receptors. **Table 4.2-7** shows the LSTs applied to the project.

TABLE 4.2-7
LOCALIZED SIGNIFICANCE THRESHOLDS[1]

	NO_x[2]	CO	PM_{10}	$PM_{2.5}$
200 Meters	103	2,629	66	21
300 Meters	117	3,837	90	37
400 Meters	131	5,044	114	52
500 Meters	146	7,460	162	84

1 SRA 6 West San Fernando Valley, 2-acre site (pounds/day).
2 NOx: The screening criteria for NOx were developed based on the 1-hour NO_2 CAAQS of 0.18 ppm. However, since the publication of the SCAQMD's guidance, the USEPA has promulgated a 1-hour NO_2 NAAQS of 0.100 ppm based on a 98th percentile value, which is more stringent than the CAAQS. In order to determine if project emissions would result in an exceedance of the 1 hour NO_2 NAAQS, an approximated LST was estimated to evaluate the federal 1-hour NO_2 standard, as the SCAQMD significance threshold has not been updated to reflect this standard. This was calculated by scaling the NO_2 LST using the ratio of 1-hour NO_2 standards (federal/state) (i.e., 236 lbs/day * (0.10/0.18) = 131 lbs/day).

Source: SCAQMD 2003a.

The SCAQMD conducted CO modeling for the 2003 AQMP for the four worst-case intersections in the Air Basin.[6] These include: (a) Wilshire Boulevard and Veteran Avenue; (b) Sunset

6 The AQMP chose to analyze the four worst intersections based on traffic and meteorological conditions. The AQMP accepts that if these four worst intersections are below the thresholds than any other intersection below those traffic levels would also not exceed the CO hotspot thresholds. Therefore, as long as the project's traffic increase does not increase any intersection to above 200,000 daily trips (the number of trips required to create CO hotspot at the worst case intersection) then the project would not have the potential to create a CO hotspot.

Boulevard and Highland Avenue; (c) La Cienega Boulevard and Century Boulevard; and (d) Long Beach Boulevard and Imperial Highway. In the 2003 AQMP, the SCAQMD notes that the intersection of Wilshire Boulevard and Veteran Avenue is the most congested intersection in Los Angeles County, with an average daily traffic volume of about 100,000 vehicles per day (SCAQMD, 2003b). This intersection is located near the on- and off-ramps for Interstate 405 in West Los Angeles. The evidence provided in Table 4-10 of Appendix V of the 2003 AQMP shows that the peak modeled CO concentration due to vehicle emissions at these four intersections was 4.6 ppm (1-hour average) and 3.2 (8-hour average) at Wilshire Boulevard and Veteran Avenue.[7]

When added to the existing background CO concentrations, the screening values would be 8.7 ppm (1-hour average), and 5.6 ppm (8-hour average) (SCAQMD, 2003b). In order for these intersections to exceed the AAQS, the daily traffic would need to exceed 200,000 vehicles per day.[8] For the purposes of analyzing CO hotspots, intersections are considered to result in a CO hotspot if daily traffic at the analyzed intersections exceeds 200,000 vehicles per day.

Routes for the soil have the potential to travel through up to eight air basins and 15 air districts, and outside of California. Transportation emissions for soils are evaluated against the emissions criteria for the air districts they travel through. As CEQA does not cover jurisdictions outside of California, emissions from VMT beyond the California border are included in the analysis for informational purposes but are not included as part of the significance determination for the project. Significance thresholds for each air district are included in **Table 4.2-8**.

TABLE 4.2-8
SIGNIFICANCE THRESHOLDS FOR OFFSITE TRUCK TRAFFIC

	ROC/VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
South Central Coast Air Basin						
VCAPCD[1] (lbs/day)	25	25	N/A	N/A	N/A	N/A
South Coast Air Basin						
SCAQMD[2] (lbs/day)	55	55	550	150	150	55
Mojave Desert Air Basin						
SCAQMD[2] (lbs/day)	55	55	550	150	150	55
AVAQMD[3] (lbs/day)	137	137	548	137	82	82
(tons/year)	25	25	100	25	15	15
MDAQMD[4] (lbs/day)	137	137	548	137	82	65
(tons/year)	25	25	100	25	15	12

7 The 8-hour average is based on a 0.7 persistence factor, as recommended by the SCAQMD.

8 The 200,000 vehicles per day is based on the 8-hour average. The 8-hour CO standard is 9 ppm. The ambient is 2.4 ppm (5.6 ppm - 3.2 ppm). Therefore, the CO emissions at the intersection would need to exceed 6.6 ppm (9 ppm – 2.5 ppm) before the intersection would exceed the standard. With 100,000 vehicles the intersection results in CO emissions of 3.2 ppm. Therefore, the intersection would need to more than double (6.6 ppm/3.2ppm = 2.06) to exceed 6.6 ppm and the standard when added to the background.

	ROC/VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
ECKAPCD[5] (lbs/day)	137	137	N/A	N/A	N/A	N/A
San Joaquin Valley Air Basin						
SJVAPCD[6] (tons/year)	10	20	100	27	15	15
Salton Sea Air Basin						
ICAPCD[7] (lbs/day)	55	55	550	150	150	N/A
Great Basin Valleys Air Basin						
GBUAPCD[8]	N/A	N/A	N/A	N/A	N/A	N/A
Sacramento Valley Air Basin						
SMAQMD[9] (lbs/day)	65	65	N/A	N/A	80	80
(tons/year)	N/A	N/A	N/A	N/A	14.6	15
YSAQMD[10] (lbs/day)	N/A	N/A	CAAQS	N/A	80	N/A
(tons/year)	10	10	N/A	N/A	N/A	N/A
CCAPCD[11]	N/A	N/A	N/A	N/A	N/A	N/A
GCAPCD[12]	N/A	N/A	N/A	N/A	N/A	N/A
TCAPCD[13] (lbs/day) - a	25	25	N/A	N/A	80	N/A
(lbs/day) - b	137	137	N/A	N/A	137	137
SHCAQMD[14](lbs/day) - a	25	25	N/A	N/A	80	N/A
(lbs/day) - b	137	137	N/A	N/A	137	137
Northeast Plateau Air Basin						
SCAPCD[15] (lbs/day)	250	250	250	250	250	250
(tons/year)	40	40	100	40	15	N/A

NOTE: lbs/day = pounds per day;

1 VCAPCD, 2003.
2 SCAQMD, 2015b.
3 AVAQMD, 2011.
4 MDAQMD, 2016.
5 EKCAPCD, 1999.
6 SJVAPCD, 2015.
7 ICAPCD, 2007; Note: these are operational thresholds as there are no applicable construction related thresholds.
8 GBUAPCD No established thresholds.
9 SMAQMD, 2009.
10 YSAQMD, 2007
11 Colusa County APCD: No established thresholds.
12 Glenn County APCD No established thresholds.
13 TCAPCD, 2015; Note: this air district has two thresholds for EIRs, if threshold A is exceeded a project is significant if best management practices are not incorporated, if threshold B is exceeded a project is significant and unavoidable even if best management practices are incorporated.
14 SHCAQMD, 2004; Note: this air district has two thresholds for EIRs, if threshold A is exceeded a project is significant if best management practices are not incorporated, if threshold B is exceeded a project is significant and unavoidable even if best management practices are incorporated.
15 SCAPCD, 2016.

There is no recommended threshold for a significant Valley Fever impact. However, the following factors may indicate a project's potential to create significant Valley Fever impacts (County of Los Angeles, 2015):

- Disturbance of the top soil of undeveloped land (to a depth of about 12 inches);
- Dry, alkaline, sandy soils;
- Virgin, undisturbed, non-urban areas;
- Windy areas;
- Archaeological resources probable or known to exist in the area (Native American midden sites);
- Special events (fairs, concerts) and motorized activities (motocross track, All Terrain Vehicle activities) on unvegetated soil (non-grass);
- Non-native population (i.e., out-of-area construction workers).

The lead agency should consider the factors above that are applicable to the project or the project site. Based on these or other factors, if a lead agency determines that project activities may create a significant Valley Fever impact, it is recommended that the lead agency consider Valley Fever mitigation measures. These mitigation measures focus on fugitive dust control to minimize fungal spore entrainment, as well as minimizing worker and public exposure to dust.

4.2.4 Methodology

Because the proposed project consists of soil cleanup, groundwater cleanup, monitoring and maintenance, and demolition activities at the project site, the primary source of pollutant emissions associated with the project would be emissions from construction equipment, trucks, and worker vehicles. Thus, air pollutants generated by project-related construction activities have been quantitatively estimated and compared to the applicable air standards and thresholds of significance.

4.2.4.1 Cleanup Emissions

As the project site is located in unincorporated Ventura County, the project's onsite impacts related to construction activities were evaluated using the assessment methodology, criteria, and reporting procedures provided in the Ventura County Air Quality Assessment Guidelines and SCAQMD's CEQA Air Quality Handbook.

Short-term construction-generated emissions of criteria air pollutants and ozone precursors associated with the proposed project were modeled using the California Emissions Estimator Model (CalEEMod), Version 2016.3.1, User Guide for formula and emission factors for off-road construction equipment and fugitive dust emissions. EMFAC2014 was used to determine emission factors for on-road vehicles. Modeling of criteria air pollutants and ozone precursors emissions was based on project-specific data, reasonable assumptions based on projects of similar scope, or default CalEEMod values. Modeling output files are provided in Appendix D of this report. Modeled emissions were compared to both the VCAPCD thresholds as the project is

located within Ventura County as well as the SCAQMD thresholds as the project is adjacent to the Ventura County/Los Angeles County border, and Los Angeles County is within the jurisdiction of the SCAQMD.

It is estimated that up to 96 trucks, including disposal, fill import, and other deliveries, would access the site daily. Emissions from trucks for the project were determined using emission factors taken from EMFAC2014. The routes for the trucks have the potential to travel through up to eight air basins and 15 air districts depending on the disposal site chosen. Emissions from the trucks were analyzed based on distance traveled through each air basin, a maximum of 15 minutes of idling per truck,[9] and compared to the respective regulatory thresholds. Emissions of fugitive dust from paved and unpaved roadways were also included in the analysis using the methodology from USEPA's AP42 (USEPA, 2006; USEPA, 2011). The transport of impacted material associated with implementation of overall site cleanup and initial activities is expected to require travel outside the state of California. The emissions associated with the export of soil were calculated for truck travel outside the state of California and are provided for information purposes.

In addition, to determine whether or not construction activities associated with the proposed project would create significant adverse localized air quality impacts on nearby sensitive receptors, the emissions from the proposed project were compared to SCAQMD's LSTs. In conducting the localized air quality analysis, which focuses only on onsite emissions, the project's onsite construction emissions generated from combustion sources (e.g., off-road construction equipment) under a greatest degree of potential impact construction scenario were extracted from the modeling. The onsite emissions include the emissions from onsite shuttles and truck travel within the project site as well as the construction equipment.

As discussed in detail in Sections 3.6 and 3.7, the initial activities would consist of demolition and soil excavation and removal by DOE and NASA. The overall site cleanup would consist of continued demolition and soil excavation/removal activities by DOE, NASA, and all activities for Boeing.

Remediation treatments may also include soil vapor extraction, bioventing, gaseous electron donor injection, ex situ biological treatment, monitored natural attenuation, soil solidification/stabilization, thermal desorption, capping (only Boeing), lead shot and clay pigeon cleanup, groundwater extraction and treatment systems, enhanced groundwater treatment, air sparging and vapor extraction, passive treatment, bedrock removal for strontium-90, bedrock vapor extraction, and decommissioning of water supply wells.

The exact nature and timing of the alternative treatment methods for the overall cleanup project, as well as whether the method would even be used in most cases, is still unknown. The emissions from equipment for alternative methods would be similar or less intensive than soil excavation,

[9] Idling emissions are based on CARB's requirements of a maximum of 5 minutes of idling at a time. This conservatively assumes 5 minutes of idling each when entering the site, while waiting to be loaded, and while exiting the site.

demolition, and hauling. The cleanup operations are anticipated to require a maximum of 250 workers onsite. Thus, the analysis uses excavation and hauling to demonstrate worst case peak daily emissions for all remediation scenarios. Actual daily emissions could be less than those estimated by the analysis.

4.2.4.2 Monitoring and Maintenance Emissions

Long-term emissions of criteria air pollutants and ozone precursors are anticipated to occur through the monitoring and maintenance activities after the conclusion of remediation activities. These emissions were modeled using EMFAC2014 to determine emissions factors for on-road vehicles. Modeling was also based on project-specific data. Modeling assumptions and output files are provided in Appendix D of this PEIR.

Monitoring would include regular inspections of vegetation, cover soil, diversion features and monitoring wells, and ongoing evaluation and reporting of the impacted groundwater, in accordance with the conditions stipulated in the corresponding water quality sampling and analysis plan.

Monitoring and maintenance emissions were determined based on the number of workers that would access the site daily. Approximately 72 workers and contractors are anticipated to access the site daily for the course of up to 30 years of monitoring and maintenance. For the purposes of this analysis, the monitoring and maintenance emissions are addressed both as construction (combined with other construction activities that may occur concurrently) and as operational emissions that operate for an extended period of time.

CO Hotspots

Localized areas where ambient concentrations of CO exceed state and/or federal standards are termed CO hotspots. Emissions of CO are produced in greatest quantities from motor vehicle combustion and are usually concentrated at or near ground level because they do not readily disperse into the atmosphere, particularly under cool, stable (i.e., low or no wind) atmospheric conditions. As shown in Table 4.2-2, CO levels in the project area are substantially below the federal and state standards. Maximum CO levels in recent years are 2.7 ppm (8-hour average) compared to the thresholds of 9.0 ppm (8-hour average). Carbon monoxide decreased dramatically in the SCAB with the introduction of the catalytic converter in 1975. No exceedances of CO have been recorded at monitoring stations in the Air Basin for some time, and the Basin is currently designated as a CO attainment area for both the CAAQS and NAAQS. The analysis used the project traffic study (KOA, 2017) to determine total number of daily trips at each studied intersection by multiplying the PM peak-hour traffic by 10.[10]

[10] The traffic volume was estimated based on the peak hour intersection volumes under future with project conditions and the general assumption that peak hour trips represent approximately 10 percent of daily trip volumes (the Federal Highway Administration considers 10 percent to be a standard assumption) (FHA, 2014).

Toxic Air Contaminants

For the purposes of CEQA, DTSC has established thresholds of significance applicable to the project for TAC emissions during implementation of the project conditions. The significance criteria and analysis of potential impacts related to TAC emissions are provided in Section 4.7, *Hazards and Hazardous Materials*, of this PEIR.

4.2.5 Analysis of Project Impacts

The following text describes the potential environmental impacts related to air quality associated with implementing the overall site cleanup and initial activities, demarcated as impact "a" and "b" respectively. As presented in Section 3.7, *Initial Activities*, of this PEIR, the initial activities include eight different projects. Depending on the degree to which impacts of the initial activities would be similar to or different from each other, the impact analysis for the initial activities for some thresholds has been combined accordingly (i.e., the number of separate discussions for impact for each threshold ranges from one to eight). Following each potential impact is a significance determination for each potential impact. Each impact discussion concludes with a significance determination.

4.2.5.1 Applicable Air Quality Plans

Program Assessment

Impact 4.2-1a: Would implementation of the **overall site cleanup** result in conflicts with or obstruction of implementation of the applicable air quality plans?

Overall Site Cleanup (Impact 4.2-1a)

The overall site cleanup would be consistent with the VCAPCD's and SCAQMD's AQMPs if it does not result in population growth above the most recently adopted AQMP or is consistent with the emission reduction strategies included in the AQMP.

The overall site cleanup would not result in any population growth within the area, as it does not propose additional housing, and employees are anticipated to commute from the local area. Therefore, the overall site cleanup would be consistent with the growth assumptions in the AQMPs. Additionally, because the overall site cleanup is not a typical land-use development project, the strategies identified in the AQMPs for transportation and reduction of VMT are not applicable to the cleanup activities. The overall site cleanup would be consistent with the applicable AQMPs and would result in a less than significant impact.

The overall site cleanup would conflict with the VCAPCD's and SCAQMD's AQMPs reduction strategies in that the project level emissions would exceed the regulatory thresholds for NO_X within each of the air basins and $PM_{2.5}$ for SCAQMD. As discussed in detail under Impact 4.2-2a (see Section 4.2.5.2, *Air Quality Standards*), even with the implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, and HAZ-2, project emissions of NOx would not be reduced to below VCAPCD's thresholds and PM_{10} and $PM_{2.5}$ emissions would still exceed SCAQMD thresholds. Therefore, the overall site cleanup has the potential to result in daily exceedances within the SCCAB and SCAB and would conflict with the VCAPCD and

SCAQMD AQMP goals of reducing regional pollutant emissions consistent with the SIP. With mitigation, the project level NOx emissions would be below applicable SCAQMD regional thresholds. Because the overall site cleanup would be in conflict with the VCAPCD's and SCAQMD's AQMP, this impact would be significant and unavoidable, even with implementation of mitigation.

> Conclusion: The overall site cleanup would conflict with implementation of VCAPCD's applicable air quality plan due to the exceedance of NOx, and SCAQMD's applicable air quality plan due to the exceedance of $PM_{2.5}$, even after mitigation. This impact would be significant and unavoidable and no additional feasible mitigation to reduce these emissions is available.

Impact 4.2-1a Determination: *The* ***overall site cleanup*** *would result in conflicts with or obstruction of implementation of the applicable air quality plan within the VCAPCD and SCAQMD. This impact would be* ***significant and unavoidable*** *even with the implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, and HAZ-2. No additional feasible mitigation is available.*

Initial Project Assessment

Impact 4.2-1b: Would implementation of the **initial activities** result in conflicts with or obstruction of implementation of the applicable air quality plans?

Initial Activities (Impact 4.2-1b)

As discussed in Section 3.7, *Initial Activities*, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The initial activities, like the overall site cleanup, are not anticipated to result in any population growth within the project area. Therefore, these activities would be consistent with the growth assumptions in the AQMPs. Additionally, because the initial activities are not a typical land-use development project, the reduction measures identified in the AQMPs for transportation and reduction are not applicable. The initial activities are therefore consistent with the applicable AQMPs and this impact would be less than significant.

Similar to the overall site cleanup, the initial activities would conflict with the VCAPCD and SCAQMD AQMPs' reduction strategies in that project-level emissions would exceed the regulatory thresholds for NO_X according to the VCAPCD and SCAQMD and for PM_{10} and $PM_{2.5}$ with the SCAQMD. As discussed in detail for Impact 4.2-2b (see Section 4.2.5.2, *Air Quality Standards)*, even with implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, and HAZ-2, project emissions of NOx, would not be reduced to below VCAPCD's thresholds and $PM_{2.5}$ would not be reduced below SCAQMD thresholds. With mitigation, NOx emissions from initial activities would be below applicable SCAQMD's regional thresholds for NOx. This impact would be significant and unavoidable due to exceedance of the VCAPCD's and SCAQMD's AQMP.

> Conclusion: The initial activities would conflict with implementation of VCAPCD's applicable air quality plan due to the exceedance of NOx, and SCAQMD's applicable air quality plan due to the exceedance of $PM_{2.5}$ even after mitigation. This impact would be significant and unavoidable impact and no additional feasible mitigation to reduce these emissions is available.

Impact 4.2-1b Determination: *The **initial activities** would result in conflicts with or obstruction of implementation of the applicable AQMP within the VCAPCD and SCAQMD. This impact would **significant and unavoidable** even with the implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, and HAZ-2. No additional feasible mitigation is available.*

4.2.5.2 Air Quality Standards

Program Assessment

Impact 4.2-2a: Would implementation of the **overall site cleanup** result in violation of air quality standards or contribute substantially to existing or projected air quality violations?

Overall Site Cleanup (Impact 4.2-2a)

The overall site cleanup is anticipated to begin within approximately one year of certification of the PEIR. Soil removal is estimated to be completed by 2038. As stated in Section 3.6.5 *Schedule, Workforce, and Equipment*, of this PEIR, it is anticipated that most site activities would occur 5 days per week (Monday through Friday), 11 hours per day (7:00 a.m. to 6:00 p.m.). Longer work days during the summer and work on Saturdays may occur. As many as 250 employees are expected to be routinely onsite during soil removal activities. Use of heavy off-road construction equipment would be required during the soil and groundwater cleanup activities at the site. The overall site cleanup also would involve the use of smaller power tools, generators, and other pollutant sources. During each of the various activities (vegetation removal, clearing, grubbing, road improvements, excavation, stockpiling, etc.) there would be a different combination of construction equipment. As such, cleanup activity pollutant emissions at and near the site would

fluctuate depending on the particular type, number, and duration of use of the various pieces of construction equipment.

Overall site cleanup described in Section 3.6 of this PEIR would involve soil excavation and disposal, groundwater remediation, and well abandonment, among other activities, as discussed in Section 4.2-3. The construction equipment used for the overall site cleanup would include but is not limited to dozers, loaders, excavators, scrapers, trucks, water trucks, mobile dewatering units, drill rigs, pavers, sweepers, compactors, and cement trucks (see Table 3-7). For the purpose of conducting a conservative analysis, air emissions were estimated for the greatest degree of potential impact for daily and annual emissions. Emissions from the overall site cleanup are identified and are compared to both the VCAPCD and SCAQMD thresholds for construction activities. Emissions estimates take into account the applicable regulatory requirements for each air district as applicable. Specific reductions were taken into account in the modeling based on VCAPCD's Rule 55, which manages fugitive dust emissions, and the use of USEPA Tier 3 off-road equipment. **Table 4.2-9** details the maximum emissions based on the longest anticipated haul routes for each administrative area, including monitoring and maintenance activities, which could occur at the same time as the program activities. As shown, the onsite equipment usage results in a potentially significant impact for NO_X within both VCAPCD and SCAQMD jurisdictions and PM_{10} and $PM_{2.5}$ within SCAQMD's jurisdiction, but is below the VCAPCD and SCAQMD thresholds SCAQMD thresholds for ROC/VOC, CO, and SO_X. VCAPCD does not have thresholds for PM_{10} and $PM_{2.5}$.

Table 4.2-9 also shows the long-term, monitoring and maintenance, emissions associated with the Resource Conservation and Recovery Act (RCRA) post-closure activities compared to the operational thresholds for both the VCAPCD and SCAQMD. As shown, no emissions are anticipated to exceed operational regulatory thresholds for either air district. Therefore, with respect to long-term emissions, the overall site cleanup would be less than significant.

Onsite emissions of NO_X, PM_{10} and $PM_{2.5}$ can be reduced by implementation of Mitigation Measure AQ-1, which requires the use of USEPA Tier 4 final equipment that increases engine efficiencies and reduces pollutant emissions. Emissions of PM_{10} and $PM_{2.5}$ would be reduced based on the implementation of Mitigation Measure AQ-3, which supplements VCAPCD's Rule 55. However, even with implementation of Mitigation Measures AQ-1, AQ-3, and GHG-2, which reduce ROC/VOC, NO_X, CO, and particulate matter over the unmitigated emissions, for the overall site cleanup would still result in significant and unavoidable impacts, as shown in **Table 4.2-10** for NO_X in the VCAPCD and PM_{10} and $PM_{2.5}$ in the SCAQMD.

TABLE 4.2-9
OVERALL UNMITIGATED SITE CLEANUP EMISSIONS

		Estimated Emissions (Pounds per Day)[1]					
		ROC/VOC	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Maximum Emissions by Activity							
Onsite[2]		5	101	90	<1	112	24
Crew[3]		1	4	39	<1	16	4
Monitoring and Maintenance[4]		<1	1	11	<1	5	1
Offsite (Haul Trucks VCAPCD/SCAQMD)		5	266	23	1	185	48
Maximum Emissions by Air District							
VCAPCD	Onsite	5	101	90	<1	112	24
	Offsite – Crew[4]	1	3	31	<1	13	3
	Offsite – Haul[4]	<1	14	1	<1	9	3
	Monitoring and Maintenance[5]	<1	1	9	<1	3	1
	Total Emissions[4]	6	**119**	131	<1	138	30
	Threshold	25	25	N/A	N/A	N/A	N/A
	Significant	No	**Yes**	No	No	No	No
SCAQMD	Onsite	5	101	90	<1	112	24
	Offsite – Crew[4]	1	4	39	<1	16	4
	Offsite – Haul[4]	5	251	21	1	175	45
	Monitoring and Maintenance[5]	<1	1	11	<1	5	<1
	Total Emissions[4]	11	**358**	161	1	308	74
	Threshold	55	55	550	150	150	55
	Significant	No	**Yes**	No	No	**Yes**	**Yes**
Long-term Maintenance and Monitoring Emissions by Air District							
VCAPCD	Total Emissions[5]	<1	1	9	<1	5	1
	Threshold	25	25	NA	NA	NA	NA
	Significant	No	No	No	No	No	No
SCAQMD	Total Emissions[5]	<1	1	11	<1	5	1
	Threshold	55	55	550	150	150	55
	Significant	No	No	No	No	No	No

SOURCE: ESA, 2017a (see Appendix D).
Notes:

1 Totals may not add exactly due to rounding; "<" indicates that emissions are less than the indicated value.

2 Onsite emissions are those related to the emissions from the operation of construction equipment and fugitive dust emissions resulting from excavation of impacted soils.

3 Emissions for crew and Monitoring and Maintenance represent the maximum emissions from crew trips based on number of workers and a total trip length of 40 miles without regard to within which air district the miles are traveled.

4 Emissions for crew, haul trucks and monitoring and maintenance for each air district represents the maximum emissions from vehicle trips that could occur based on the number of workers and the majority of the trip occurring within the air district being analyzed. Therefore, totaling emissions from the two individual air districts will not equal the emissions presented in the "Maximum Emissions by Activity" section.

5 Total emissions differ between air districts because emissions from the crew is determined based on the maximum emissions that could occur assuming all workers travel the maximum possible distance within each air district. Therefore, the addition of the two air districts exceeds the monitoring and maintenance number reported in "Maximum Emissions By Activity" section.

NO_X emissions in the SCAQMD would be reduced to below regulatory thresholds. Note that VCAPCD does not have regional project-level thresholds for CO, PM_{10}, or $PM_{2.5}$. In addition to Mitigation Measure AQ-1 and AQ-3, Mitigation Measures AQ-2, AQ-4, AQ-5, BIO-5, GHG-1, HAZ-2, and TRANS-1 would also reduce criteria pollutant emissions. Mitigation Measures AQ-2 and BIO-5 reduce fugitive dust through monitoring and revegetation activities. Mitigation Measures AQ-4 and HAZ-2 reduce ROC/VOC emissions by following established procedures for handling and disposal of fuel contaminated soils. Mitigation Measure AQ-5 reduces exhaust emissions by limiting the amount of time vehicles can idle onsite. Mitigation Measure GHG-2 reduces criteria pollutant emissions by reducing haul truck emissions. GHG-3 could reduce criteria pollutants depending on the GHG reduction measures chosen. However, while these measures have the potential to reduce emissions, there is not enough information available as to the exact timing and implementation of the measures for these reductions to be quantified. Therefore, even with implementation of these additional mitigation measures, impacts from the overall site cleanup would remain significant and unavoidable.

TABLE 4.2-10
MITIGATED OVERALL SITE CLEANUP EMISSIONS

		Estimated Emissions (Pounds per Day)[1]					
Jurisdiction	**Scenario**	**ROC/VOC**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
VCAPCD	Onsite	2	**20**	91	<1	92	15
	Offsite - Crew	1	3	31	<1	13	3
	Offsite - Haul	<1	1	1	<1	10	2
	Monitoring and Maintenance [2]	<1	<1	9	<1	4	1
	Overall Program	3	**25**	132	<1	118	21
	Threshold	25	25	N/A	N/A	N/A	N/A
	Significant	No	**Yes**	No	No	No	No
SCAQMD	Onsite	2	**20**	91	<1	92	15
	Offsite - Crew	1	4	39	<1	16	4
	Offsite - Haul	1	24	9	1	173	43
	Monitoring and Maintenance [2]	<1	1	11	<1	5	1
	Overall Program	5	49	150	1	**286**	**62**
	Threshold	55	55	550	150	150	55
	Significant	No	No	No	No	**Yes**	**Yes**

Notes:
1 Totals may not add exactly due to rounding; "<" indicates that emissions are less than the indicated value.
2 Monitoring and maintenance emissions differ between air districts because emissions from the crew is determined based on the maximum emissions that could occur assuming all workers travel the maximum possible distance within each air district. Therefore, monitoring and maintenance emissions differ between the air districts.

SOURCE: ESA, 2017a (see Appendix D).

In addition to onsite emissions, up to 96 trucks would be accessing the site daily. This results in a maximum of 192 one-way trips. Based on the routes and location of disposal facilities, project-related trucks have the potential to travel through up to eight air basins and 15 air districts. **Table 4.2-11** compares the maximum emissions anticipated per air district, assuming that all trucks travel through that district (based on location of potential disposal sites and the RP's potential use in each air basin). SCCAB (VCAPCD) and SCAB (SCAQMD) air basin emissions are not included in Table 4.2-11 because they are included in the previous discussion associated with overall site cleanup emissions. Transportation emissions within each air basin are evaluated against the emissions thresholds for each air district.

TABLE 4.2-11
UNMITIGATED TRUCK EMISSIONS BY AIR BASIN

		Estimated Emissions (Pounds per Day)					
Air Basin	**Air District**	**ROC/VOC**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
SSAB	Total Emissions	4	**211**	19	<1	146	37
	ICAPCD threshold	55	55	550	150	150	N/A
MDAB	Total Emissions	8	**404**	36	1	**279**	**72**
	SCAQMD threshold	55	55	550	150	150	55
	MDAQMD threshold	137	137	548	137	82	65
	AVAQMD threshold	137	137	458	137	82	82
	EKCAPCD threshold	137	137	N/A	N/A	N/A	N/A
GBAVB	Total Emissions	6	310	27	1	214	55
	GBUAPCD threshold	N/A	N/A	N/A	N/A	N/A	N/A
SACVAB	Total Emissions	6	**309**	27	1	**213**	55
	SMAQMD threshold	65	65	N/A	N/A	80	80
	YSAQMD threshold	N/A	N/A	CAAQS	N/A	80	N/A
	CCAPCD threshold	N/A	N/A	N/A	N/A	N/A	N/A
	GCAPCD threshold	N/A	N/A	N/A	N/A	N/A	N/A
	TCAPCD threshold	25	25	N/A	N/A	80	N/A
	SHCAQMD threshold	25	25	N/A	N/A	80	N/A
NEPAB	Total Emissions	2	89	8	<1	62	16
	SCAPCD threshold	250	250	250	250	250	250
	Exceed Threshold?	***No***	***Yes***	***No***	***No***	***Yes***	***Yes***
Air Basin	**Air District**			**Tons/year**			
MDAB	Total Emissions	1	**41**	4	<1	**28**	7
	MDAQMD threshold	25	25	100	25	15	12
	AVAQMD threshold	25	25	100	25	15	15
SJVAB	Total Emissions	1	**32**	3	<1	**22**	6
	SJAPCP threshold	10	10	100	27	15	15
SACVAB	Total Emissions	<1	20	2	<1	14	4
	SMAQMD threshold	N/A	N/A	N/A	N/A	15	15
	YSAQMD threshold	10	10	N/A	N/A	N/A	N/A

Air Basin	Air District	Estimated Emissions (Pounds per Day)					
		ROC/VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
NEPAB	Total Emissions	<1	6	1	<1	4	1
	SCAPCD threshold	40	40	100	40	15	N/A
	Exceed Threshold?	***No***	***Yes***	***No***	***No***	***Yes***	***No***
	Outside California						
	Total Emissions (lbs/day)	43	2,059	182	7	1,421	365
	Total Emissions (tons/year)	4	178	15	1	123	32

SOURCE: ESA, 2017a (see Appendix D).

"<" indicates that emissions are less than the indicated value.
Bold means that thresholds are exceeded.

Emissions in this table are based on the maximum potential miles traveled within each air basin based on the potential disposal sites for each RP and the miles traveled within each air basin to reach those disposal sites. These are potential maximum emissions within each air basin and actual emissions within each basin will vary based on the disposal site chosen and number of trucks per day/year that would travel to those sites.

Because CEQA does not cover jurisdictions outside of California, emissions from VMT beyond the California border are included in the analysis for informational purposes and are not compared to any thresholds. As seen in Table 4.2-11, truck emissions exceed the thresholds for jurisdictions within the SSAB, MDAB, SACVAB, and SJVAB for NO_X; MDAB, SACVAB, and SJVAB for PM_{10}; and MDAB for $PM_{2.5}$ without implementation of mitigation. With implementation of Mitigation Measure GHG-2, emissions would be reduced to below the regulatory thresholds for NO_X in all air basins however would remain significant and unavoidable for PM_{10} in MDAB, SACVAB and SJVAB and for $PM_{2.5}$ in MDAB, as seen in **Table 4.2-12**.

TABLE 4.2-12
MITIGATED TRUCK EMISSIONS BY AIR BASIN

Air Basin	Air District	Estimated Emissions (Pounds per Day)					
		ROC/VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
SSAB	Total Emissions	1	21	9	1	143	35
	ICAPCD threshold	55	55	550	150	150	N/A
MDAB	Total Emissions	2	40	17	1	**274**	**68**
	SCAQMD threshold	55	55	550	150	150	55
	MDAQMD threshold	137	137	548	137	82	65
	AVAQMD threshold	137	137	458	137	82	82
	EKCAPCD threshold	137	137	N/A	N/A	N/A	N/A
GBAVB	Total Emissions	2	31	13	1	211	52
	GBUAPCD threshold	N/A	N/A	N/A	N/A	N/A	N/A
SACVAB	Total Emissions	2	31	13	1	**210**	52
	SMAQMD threshold	65	65	N/A	N/A	80	80
	YSAQMD threshold	N/A	N/A	CAAQS	N/A	80	N/A

Air Basin	Air District	Estimated Emissions (Pounds per Day)					
		ROC/VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
	CCAPCD threshold	N/A	N/A	N/A	N/A	N/A	N/A
	GCAPCD threshold	N/A	N/A	N/A	N/A	N/A	N/A
	TCAPCD threshold	25	25	N/A	N/A	80	N/A
	SHCAQMD threshold	25	25	N/A	N/A	80	N/A
NEPAB	Total Emissions	1	9	4	<1	61	15
	SCAPCD threshold	250	250	250	250	250	250
	Exceed Threshold?	***No***	***No***	***No***	***No***	***Yes***	***Yes***
Air Basin	**Air District**	**Tons/year**					
MDAB	Total Emissions	1	3	2	<1	**28**	7
	MDAQMD threshold	25	25	100	25	15	12
	AVAQMD threshold	25	25	100	25	15	15
SJVAB	Total Emissions	<1	3	1	<1	**22**	5
	SJAPCP threshold	10	10	100	27	15	15
SACVAB	Total Emissions	<1	2	1	<1	14	3
	SMAQMD threshold	N/A	N/A	N/A	N/A	15	15
	YSAQMD threshold	10	10	N/A	N/A	N/A	N/A
NEPAB	Total Emissions	<1	1	<1	<1	4	1
	SCAPCD threshold	40	40	100	40	15	N/A
	Exceed Threshold?	***No***	***No***	***No***	***No***	***No***	***No***
Outside California							
Total Emissions (lbs/day)		12	204	84	7	1,401	345
Total Emissions (tons/year)		1	17	7	1	121	30

SOURCE: ESA, 2017a (see Appendix D).

"<" indicates that emissions are less than the indicated value.
Bold means that thresholds are exceeded.

Emissions in this table are based on the maximum potential miles traveled within each air basin based on the potential disposal sites for each RP and the miles traveled within each air basin to reach those disposal sites. These are potential maximum emissions within each air basin and actual emissions within each basin will vary based on the disposal site chosen and number of trucks per day/year that would travel to those sites.

Health Impacts Assessment

Summary of Emissions Exceeding the Significance Thresholds

The mitigated emissions from the overall site cleanup would potentially result in significant air quality impacts in two of the eight air basins within California—the SCCAB and the SCAB. The SCCAB consists of San Luis Obispo, Santa Barbara, and Ventura Counties and covers an area of approximately 7,880 square miles (USCB, 2016). The SCAB consists of Orange County, Los Angeles County except for the Antelope Valley, the non-desert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County and covers an area of approximately 6,745 square miles (SCAQMD, 1999).

Implementation of the overall site cleanup, even with the incorporation of mitigation measures, would potentially exceed the regional significance thresholds for emissions of NO_X within the Ventura County portion of the SCCAB and the SCAB. Air pollutant emissions in all other air basins, which would result only from truck emissions, would be below applicable significance thresholds after incorporation of mitigation measures, as shown previously in Table 4.2-12. The potential for the overall site cleanup to cause or contribute to localized and regional health impacts from the emissions of criteria pollutants in excess of the regional emissions thresholds of significance is assessed below. The Health Impact Assessment is provided for informational purposes only and does not influence the significance determination.

Summary of Pollutant Health Concerns

The emission exceedances would be a result of fossil fuel combustion (primarily diesel) from heavy-duty off-road equipment operating on the site and from on-road trucks and vehicles traveling on local roadways and regional highways within the SCCAB and SCAB. Based on the potential for the overall site cleanup to generate emissions in these air basins in excess of the applicable regional thresholds of significance, this assessment evaluates the potential to contribute to NO_2-related health impacts during the approximately 15-year duration of the overall site cleanup. Because emissions of NO_X are also ozone and particulate matter precursor emissions, this assessment also evaluates the potential for the overall site cleanup to contribute to regional ozone formation and ozone health impacts and secondary particulate matter health impacts.

NO_X is a term that refers to a group of compounds containing nitrogen and oxygen. The primary compounds of air quality concern include NO_2 and NO. There are no health-based ambient air quality standards specifically for NO; however, NO can oxidize in the atmosphere to form NO_2. As discussed previously in Section 4.2.1.2, NO_2 can potentially irritate the nose and throat, aggravate lung and heart problems, and may increase susceptibility to respiratory infections, especially in people with asthma. Emissions of NO_X are a precursor to the formation of ground-level ozone, which occurs due to complex photo-chemical reactions of these pollutants in the atmosphere in the presence of sunlight. NO_2 can also potentially contribute to the secondary formation of particulate matter (PM_{10} and $PM_{2.5}$) from conversion in the atmosphere. As discussed previously in Section 4.2.1.2, ozone is a respiratory irritant that can cause severe ear, nose, and throat irritation and increased susceptibility to respiratory infections. Exposure to particulate matter is associated with increased risk of hospitalization for lung and heart-related respiratory illness, including emergency room visits for asthma.

Summary of Attainment Designations

Implementation of the overall site cleanup could contribute to potential NO_X exceedance of the VCAPCD and SCAQMD thresholds in the SCCAB and SCAB, respectively. A summary of the attainment designations for those criteria pollutants in which the overall site cleanup would potentially exceed the significance thresholds in the SCCAB and SCAB are provided below.

As shown in Table 4.2-4, the SSFL site area, located in the Ventura County portion of the SCCAB, is designated as nonattainment for the federal and state ozone standards and attainment

for the federal and state NO_2 standards. The Ventura County portion of the SCCAB is designated as attainment for the federal PM_{10} standards, nonattainment for the state PM_{10} standards, and attainment for the federal and state $PM_{2.5}$ standards. The SCAB is designated as nonattainment for the federal and state ozone standards and attainment or unclassified/attainment for the federal and state NO_2 standards. The SCAB is designated as attainment for the federal PM_{10} standards, nonattainment for the state PM_{10} standards, and nonattainment for the federal and state $PM_{2.5}$ standards.

Regional Effects

The potential for the overall site cleanup to cause or contribute to exceedances of the health-based ambient air quality standards on a regional basis is discussed above under Section 4.2.5.2, Overall Site Cleanup (Impact 4.2-2a). As shown in Table 4.2-10, even with implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, HAZ-2, and TRANS-1, the overall site cleanup would potentially exceed the applicable regional significance thresholds for NO_X in the SCCAB (the portion under VCAPCD jurisdiction) and in the SCAB (under SCAQMD jurisdiction). The level of exceedance of the NO_X significance thresholds, as shown in Table 4.2-10, would occur if implementation of the overall site cleanup were to occur at the earliest practical date as conservatively assumed in the emissions analysis. If the implementation of cleanup activities is delayed or occurs over a longer time period, maximum daily emissions could be reduced due to several factors, which include: (1) the availability of a more modern, cleaner-burning construction equipment fleet mix, and (2) a less intensive buildout schedule (lower daily emissions occurring over a longer time interval). However, it is not possible to predict accurately the level of NO_X emissions reductions that could be expected from future yet-to-be-adopted regulations that would be expected to result in a cleaner-burning construction fleet mix. For instance, one of the key strategies in the SCAQMD 2016 AQMP is the development of a fair-share emissions reductions strategy at the federal, state, and local levels, which includes a new ultra-low NO_X federal engine emission standard for heavy-duty trucks. In June 2016, the SCAQMD and other environmental agencies throughout the nation petitioned USEPA to adopt more stringent tailpipe emissions standards for large trucks that is 10 times more stringent than the current limit (SCAQMD, 2016c). USEPA responded to the petition by stating that it intends to "work closely with CARB" and "initiate the work necessary to issue a Notice of Proposed Rulemaking for a new on-highway heavy-duty NO_X program with the intention of proposing standards that could begin in Model Year 2024" (USEPA, 2016c). It is possible that compliance with a future proposed rule would be phased-in over a number of years, similar to how previous rules have been implemented in the past. USEPA has not released a draft version of the proposed rulemaking and is not expected to until 2019 or later; therefore, it is not possible to accurately predict the potential level of NO_X emissions reductions that could be expected from the phase-in of this future proposed rulemaking.

CARB compiles emissions inventories for air basins in the state. Based on the most recent air basin data available from CARB, the anthropogenic (i.e., man-made) sources of emissions in the SCCAB and SCAB are summarized in **Table 4.2-13**. For comparison purposes, the estimated maximum daily emissions within the SCCAB and SCAB from implementation of the overall site cleanup are provided and compared to the air-basin-wide emissions.

TABLE 4.2-13
EMISSIONS INVENTORY FOR SCCAB AND SCAB

Air Basin	Estimated Emissions (Tons per Day)					
	ROC/VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
SCCAB	77.1	70.6	328.8	2.2	43.3	13.0
Overall Site Cleanup (maximum daily) [a]	0.002	0.024	0.075	0.001	0.143	0.031
Percent of Air Basin Total	0.003%	0.034%	0.023%	0.027%	0.330%	0.241%
SCAB	466.5	512.1	2,272	17.7	153.6	68.4
Overall Site Cleanup (maximum daily) [a]	0.002	0.013	0.066	<0.001	0.059	0.011
Percent of Air Basin Total	<0.001%	0.002%	0.003%	<0.001%	0.038%	0.016%

NOTES:
[a] See Table 4.2-10. Converted to units of tons per day for comparison.

SOURCES: CARB, 2012.

The accumulation and dispersion of air pollutant emissions within an air basin is dependent upon the size and distribution of emission sources in the region and meteorological factors such as wind, sunlight, temperature, humidity, rainfall, atmospheric pressure, and topography. The project's exceedance of the mass regional emissions threshold (i.e., pounds per day thresholds) from project-related activities does not necessarily indicate that the project will cause or contribute to the exposure of sensitive receptors to ground-level concentrations in excess of health-protective levels.

As discussed earlier, the SCCAB and SCAB are designated as attainment or unclassified/ attainment for NO_2 and nonattainment for ozone. The health concerns associated with NO_X emissions are related to its potential to result in the secondary formation of ground-level ozone. The formation of ground-level ozone is a complex process due to photochemical reactions of precursor pollutants (i.e., VOC and NO_X emissions) in the atmosphere in the presence of sunlight. Based on discussions with air quality management district staff (SCAQMD, 2016b), there is no model to determine whether, or the extent to which, a single project's precursor emissions would potentially result in the formation of secondary ground-level ozone and the geographic and temporal distribution of such secondary formed emissions. Based on the lack of available tools, the air quality management district staff did not recommend that the project provide a quantitative modeling analysis of secondary ground-level ozone concentrations from project-specific precursor emissions that exceed the regional mass emissions thresholds of significance as such an analysis is not possible.

As shown in Table 4.2-13, the estimated maximum daily emissions from implementation of the overall site cleanup within the SCCAB would constitute less than approximately 0.330 percent of the total SCCAB emissions for the analyzed criteria pollutants. Implementation of the overall site cleanup within the SCAB would constitute approximately 0.038 percent or less of the total SCAB emissions for the analyzed criteria pollutants. In terms of size, the overall site cleanup would represent a very small fraction of the total emissions from existing sources within each of the respective air basins. The regional emissions from implementation of the overall site cleanup would also occur over a relatively large area. The regional emissions would be widely dispersed, due to the geographic distribution of these sources, because trucks travel on highways throughout the SCCAB and the SCAB as they haul materials between the project site and appropriate offsite locations some distance away. This geographic distribution over a large area would disperse regional emissions from the overall site cleanup such that the potential contribution to ambient pollutant concentrations would likely be a very small fraction of the existing levels. Meteorological factors, such as wind, would result in additional dispersive effects as pollutants are dispersed horizontally downwind and through vertical mixing.

As described, regional emissions from the overall site cleanup would be a very small fraction of the total SCCAB and SCAB emissions and would occur over a relatively large area subject to meteorological dispersive effects. Thus, it is unlikely that the exceedance of the project-level NO_X regional mass emissions thresholds would result in a substantial measurable increase in the respective pollutant concentrations in the SCCAB or SCAB to a degree that clearly predictable and identifiable heath impacts would specifically result from this project's emissions during the overall site cleanup.

As discussed above, secondary formation of ground-level ozone and particulate matter (PM_{10} and $PM_{2.5}$) occurs through complex reactions in the atmosphere. According to the SCAQMD, "secondary pollutants (those formed in the air by chemical reactions, such as ozone and the majority of $PM_{2.5}$) reach maximum concentrations some distance downwind of the sources that emit the precursors, due to the fact that the polluted air mass is moved inland by the prevailing winds many miles to areas where maximum concentrations are reached" (SCAQMD, 2016a). Due to complexity of these atmospheric reactions, there are no CARB-approved or air quality management district-approved project-level models available to estimate the effect of a single project's emissions on the secondary formation of ground-level ozone and particulate matter, and the regional dispersion of such secondary pollutants, within an air basin. Nonetheless, because of the geographic distribution of the overall site cleanup's precursor emissions (i.e., NO_X) and meteorological dispersive effects, it is not expected that the exceedance of the project-level NO_X regional mass emissions thresholds would result in a substantial measurable increase in the concentrations of secondary pollutants in the SCCAB or SCAB to a degree that clearly predictable and identifiable heath impacts would specifically result from this project's emissions during the overall site cleanup activities.

Conclusion: The overall site cleanup would result in emissions that exceed the VCAPCD threshold for NOx and SCAQMD thresholds for PM_{10} and $PM_{2.5}$ emissions even with implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, HAZ-2, and TRANS-1. Therefore, this impact would be significant and unavoidable. No additional mitigation is feasible to further reduce overall site cleanup emissions.

Mitigation Measure GHG-3 requires the use of commercially available alternatively powered equipment to reduce GHG emissions, as well as criteria pollutant emissions, from diesel use; however, these technologies are not yet viable. Therefore, the reliance on these technologies to reduce criteria pollutant emissions cannot be assured over the lifetime of the project, and the project therefore remains significant and unavoidable for NOx within the VCAPCD and PM_{10} and $PM_{2.5}$ within the SCAQMD.

Impact 4.2-2a Determination: *The* ***overall site cleanup*** *would result in a violation of NO_X, emissions thresholds in the SCCAB and PM_{10} and $PM_{2.5}$ emissions thresholds within the SCAQMD. Therefore, the project could contribute to existing and projected air quality violations with respect to ozone, NO_2 and particulate matter. This impact would be* ***significant and unavoidable****. Mitigation Measures AQ-1 through AQ-6, BIO-5, GHG-1 through GHG-3, HAZ-2, and TRANS-1 would be required.*

Initial Project Assessment

Impact 4.2-2b: Would implementation of the **initial activities** result in violation of air quality standards or contribute substantially to existing or projected air quality violations?

Initial Activities (Impact 4.2-2b)

As discussed in Section 3.7, *Initial Activities*, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The initial activities would involve soil excavation and disposal, building demolition, and/or maintenance activities in certain portions of all administrative areas. The construction equipment

used for the overall site cleanup would also be used for these initial activities. As discussed in the impact analysis for the overall site cleanup, for the purpose of conducting a conservative analysis, air emissions were estimated for the greatest degree of potential impact for daily activities as well as greatest degree of potential impact for annual emissions.

Emissions from these activities are compared to both the VCAPCD and SCAQMD thresholds for construction activities. Emissions estimates take into account the applicable regulatory requirements for each air district. Specific reductions were taken into account in the modeling based on VCAPCD's Rule 55, which manages fugitive dust emissions, and the use of USEPA Tier 3 off-road equipment. **Table 4.2-14** summarizes the maximum emissions based on the longest truck and crew routes for each administrative area. As shown, the emissions result in a potentially significant impact for NOx for VCAPCD and SCAQMD, and PM_{10} and $PM_{2.5}$ for SCAQMD, which requires further mitigation. All other criteria pollutants are below their respective thresholds. Detailed emissions calculations are included in Appendix D of this PEIR.

TABLE 4.2-14
INITIAL ACTIVITIES EMISSIONS

		Estimated Emissions (Pounds per Day)					
		ROC/VOC	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Onsite		7	128	157	<1	119	28
Crew		<1	1	11	<1	5	1
Offsite (VCAPCD)		<1	1	<1	<1	1	<1
Offsite (SCAQMD)		4	201	17	<1	140	37
VCAPCD	Total Emissions[1]	7	**130**	166	<1	124	29
	Threshold	25	25	N/A	N/A	N/A	N/A
	Significant	No	**Yes**	No	No	No	No
SCAQMD	Total Emissions[1]	12	**330**	185	1	264	67
	Threshold	55	55	550	150	150	55
	Significant	No	**Yes**	No	No	**Yes**	**Yes**

Totals may not add exactly due to rounding; "<" indicates that emissions are less than the indicated value.
[1] Emissions for crew, haul trucks and monitoring and maintenance for each air district represents the maximum emissions from vehicle trips that could occur based on the number of workers and the majority of the trip occurring within the air district being analyzed. Therefore, totaling emissions from the two individual air districts will not equal the emissions presented in the "Maximum Emissions by Activity" section.
SOURCE: ESA, 2017a (see Appendix D).

Onsite emissions for ROC/VOC, NO_X, CO, and particulate matter can be further reduced by implementation of Mitigation Measures AQ-1, AQ-3 and GHG-2. However, as shown in **Table 4.2-15**, even with mitigation, the initial activities would still result in significant and unavoidable impacts for NO_X within the VCAPCD and PM_{10} and $PM_{2.5}$ within the SCAQMD. Emissions of NOx within the SCAQMD would be reduced to below regulatory thresholds. In addition to Mitigation Measure AQ-1, Mitigation Measures AQ-2, AQ-4, AQ-5, BIO-5, GHG-1,

GHG-3, HAZ-2, and TRANS-1 would also reduce criteria pollutant emissions as described for Impact 4.2-2a. Therefore, even with implementation of these additional mitigation measures, impacts from the initial activities would remain significant and unavoidable.

As with the overall site cleanup, there would be up to 96 trucks daily for the initial activities. Therefore, the daily truck emissions during the initial activities would be the same as those analyzed for the overall site cleanup in Table 4.2-11. VCAPCD and SCAQMD emissions are not included in Table 4.2-11 because they are included as part of the daily project emissions, which for the initial activities are detailed in Table 4.2-14. As discussed, mitigated truck emissions would exceed PM_{10} thresholds in MDAB, SACVAB and SJVAB and $PM_{2.5}$ thresholds in MDAB, as identified in Table 4.2-12.

TABLE 4.2-15
MITIGATED INITIAL ACTIVITIES CONSTRUCTION EMISSIONS

		Estimated Emissions (Pounds per Day)					
		ROC/VOC	**NOx**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
VCAPCD	Total Emissions	4	**28**	167	<1	105	23
	Threshold	25	25	N/A	N/A	N/A	N/A
	Significant	No	**Yes**	No	No	No	No
SCAQMD	Total Emissions	6	47	177	1	243	59
	Threshold	55	55	550	150	150	55
	Significant	No	No	No	No	**Yes**	**Yes**

SOURCE: ESA, 2017a (see Appendix D).

Health Impact Assessment

The potential for the initial projects to cause or contribute to exceedances of the health-based ambient air quality standards on a regional basis is discussed in detail under Impact 4.2-2a. Because the impacts are regional, the health impacts from the initial activities would be similar to or less than those of the overall site cleanup. The Health Impact Assessment is provided for informational purposes only and does not influence the significance determination.

> Conclusion: The initial activities would result in NOx emissions that exceed the VCAPCD thresholds and PM_{10} and $PM_{2.5}$ emissions that exceed SCAQMD threshold even with the implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, HAZ-2, and TRANS-1. All other criteria air pollutants are below their respective thresholds. Therefore, this impact would be significant and unavoidable. No additional mitigation is feasible to further reduce emissions from the initial activities.
>
> Mitigation Measure GHG-3 requires the use of commercially available alternatively powered equipment to reduce GHG emissions from diesel use; however, these

technologies are not yet viable. Therefore, the reliance on these technologies to reduce criteria pollutant emissions cannot be assured over the lifetime of the project, and the project therefore remains significant and unavoidable for NOx within the VCAPCD and PM_{10} and $PM_{2.5}$ within the SCAQMD.

Impact 4.2-2b Determination: *The **initial activities** would result in an exceedance of NO_X emission thresholds in the SCCAB and PM_{10} and $PM_{2.5}$ emissions within the SCAQMD. Therefore, the project could contribute to existing and projected air quality violations with respect to ozone and NO_2 and particulate matter. Even with implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1through GHG-3, HAZ-2, and TRANS-1, this impact would be **significant and unavoidable**.*

4.2.5.3 Sensitive Receptors

Program Assessment

Impact 4.2-3a: Would the **overall site cleanup** expose sensitive receptors to substantial pollutant concentrations of CO, NOx, PM_{10}, $PM_{2.5}$, and TACs?

Overall Site Cleanup (Impact 4.2-3a)

CO Hotspots

A total of 16 local intersections have the potential to be impacted by project-related traffic and were analyzed as part of the overall site cleanup's traffic analysis (Section 4.11, *Transportation and Traffic*, and Appendix H of this PEIR). The future (2032) plus project conditions were evaluated for 96 trucks per day. None of the modeled intersections in the project area have traffic volumes that exceed 200,000 vehicles per day, nor do they have any geometric qualities that would result in higher concentrations than the intersections modeled by SCAQMD in the 2003 AQMP. As shown in **Table 4.2-16**, the maximum daily vehicles through any intersection with project traffic is 81,730 at Topanga Canyon Boulevard and Burbank Boulevard.

As a result, CO concentrations are expected to be less than 8.7 ppm (1-hour average) and 5.6 ppm (8-hour average),[11] which would not exceed the thresholds of 20 ppm and 9 ppm, respectively. Thus, this comparison provides evidence that the overall site cleanup would not contribute to the formation of CO hotspots and no further CO analysis is required.

[11] Levels identified at the most congested intersections in the 2003 AQMP, as discussed earlier in the *Thresholds of Significance* section.

TABLE 4.2-16
CO HOTSPOT DETERMINATION

No.	Intersection	AM Total	PM Total	Daily Total
1	Topanga Canyon Blvd & SR 118 WB Ramp	2,577	2,860	28,600
2	Topanga Canyon Blvd & SR 118 EB Ramp	4,883	4,909	49,090
3	Rocky Peak Rd & SR 118 WB Ramps	273	255	2,550
4	Rocky Pak Rd & Santa Susana Pass Rd	535	493	4,930
5	Topanga Canyon Blvd & Plummer St	5,090	5,182	51,820
6	Valley Circle Blvd & Woolsey Canyon Rd	1,738	1,405	14,050
7	Valley Circle Blvd & Roscoe Blvd	2,278	1,907	19,070
8	Topanga Canyon Blvd & Roscoe Blvd	5,417	6,986	69,860
9	Topanga Canyon Blvd & Sherman Way	6,145	6,351	63,510
10	Valley Circle Blvd & Victory Blvd	4,011	3,081	30,810
11	Topanga Canyon Blvd & Victory Blvd	5,867	7,291	72,910
12	Topanga Canyon Blvd & Burbank Blvd	6,779	8,173	81,730
13	Topanga Canyon Blvd & US 101 NB Off Ramp	5,701	6,702	67,020
14	Valley Circle Blvd & US 101 Off Ramp/Long Valley Rd	5,354	5,229	52,290
15	Valley Circle Blvd & Calabasas Rd/Avenue San Luis	5,627	5,624	56,240
16	US 101 SB Ramps & Calabasas Rd	3,126	3,505	35,050
	Max	6,779	8,173	81,730
	Threshold			200,000
	Significant	N/A	N/A	No

Source: KOA, 2017.

Localized Construction Air Quality Impacts – Criteria Pollutants

The daily onsite construction emissions generated by the proposed project were evaluated against SCAQMD's LSTs for a 2-acre site as a screening-level analysis to determine whether the emissions would cause or contribute to adverse localized air quality impacts.[12] The nearest offsite sensitive receptors are the residential communities located approximately 1 mile north of the site; 0.3 mile east of the site; and in Bell Canyon located directly south of the project site. The Bell Canyon residences are approximately 0.5 mile from the nearest areas of onsite disturbance. Scattered residences are also located approximately 1 mile west of the site. Because the mass rate look-up tables provided by SCAQMD only give the LSTs at receptor distances of 82, 164, 328, 656, and 1,640 feet, the LSTs for a receptor distance of 1,213 feet (400 meters) was determined from the tables and used to evaluate the potential localized air quality impacts associated with the project's peak day emissions. The LSTs for a receptor distance of 1,213 feet (400 meters) was

[12] According to SCAQMD's LST methodology, LSTs are only applicable to the onsite construction emissions that are generated by a project and do not apply to emissions generated offsite such as mobile emissions on roadways from worker, vendor, and truck trips. Because this is a local analysis, emissions from offsite activities that occur outside the immediate area would not have an impact on the local conditions.

interpolated from the provided thresholds for 656 and 1,640 feet and used to evaluate the potential localized air quality impacts associated with the project's peak-day emissions. **Table 4.2-17** identifies the daily localized onsite emissions that are estimated to occur during the project's greatest degree of potential impact scenario prior to implementation of mitigation. As shown, the daily emissions generated onsite by the overall site cleanup's greatest degree of potential impact scenario would not exceed the applicable SCAQMD LST for NO_X, CO, PM_{10}, and $PM_{2.5}$. Therefore, localized impacts from criteria pollutants for the overall site cleanup would be less than significant without mitigation.

TABLE 4.2-17
OVERALL CLEANUP LST ANALYSIS

	NO_X	CO	PM_{10}	$PM_{2.5}$
Unmitigated Emissions	101	90	42	24
Threshold	131	5,045	114	53
Significant?	No	No	No	No

SOURCE: ESA, 2017a (see Appendix D).

Health Impacts Assessment - Localized Effects

The potential for the project to cause or contribute to exceedances of the health-based ambient air quality standards near the project site is evaluated in the LST analysis, as discussed earlier. The LST analysis evaluates the potential for localized emissions to cause or contribute to an exceedance of the NAAQS or CAAQS, inclusive of existing ambient background pollutant levels.

As shown in Table 4.2-17, the overall site cleanup would not exceed the applicable LSTs for localized emissions of NO_X, CO, PM_{10}, and $PM_{2.5}$. The applicable LSTs are based on screening levels that can be used to determine the maximum allowable daily emissions that would satisfy the LSTs and therefore not cause or contribute to an exceedance of the applicable ambient air quality standards without project-specific dispersion modeling. According to the emissions modeling analysis, the overall site cleanup could result in emissions of NO_X, CO, PM_{10}, and $PM_{2.5}$ approximately 17 percent, 1 percent, 12 percent, and 15 percent of the mass emission screening-level significance thresholds, respectively. Therefore, the overall site cleanup would not be expected to result in localized NO_2, CO, PM_{10}, and $PM_{2.5}$ concentrations that exceed the concentration-based air quality standards and would not cause or contribute to clearly predictable or identifiable heath impacts specifically as a result of this project's localized NO_X, CO, PM_{10}, and $PM_{2.5}$ emissions.

The secondary formation of ground-level ozone and particulate matter (PM_{10} and $PM_{2.5}$) occurs through complex reactions in the atmosphere. According to the SCAQMD, "secondary pollutants (those formed in the air by chemical reactions, such as ozone and the majority of $PM_{2.5}$) reach maximum concentrations some distance downwind of the sources that emit the precursors, due to the fact that the polluted air mass is moved inland by the prevailing winds many miles to areas where maximum concentrations are reached" (SCAQMD, 2016a). Therefore, given that the secondary formation of ozone or particulate matter (PM_{10} and $PM_{2.5}$) occurs miles downwind of

precursor emission sources, the overall site cleanup would not cause or contribute to localized health impacts from the secondary formation of ozone or particulate matter in the vicinity of the SSFL site. The Health Impact Assessment is provided for informational purposes only and does not influence the significance determination.

Localized Construction Air Quality Impacts –TACs

For the purposes of CEQA, DTSC has established thresholds of significance applicable to the project for TAC emissions during implementation of the overall site cleanup. The significance criteria and analysis of potential impacts related to TAC emissions are provided in Section 4.7, *Hazards and Hazardous Materials*, of this PEIR. As shown in Table 4.7-4, the unmitigated health risk from exposure to the TACs from the overall site cleanup would be less than significant and mitigation measures would not be required.

> Conclusion: The overall site cleanup would not result in significant CO impacts or impacts with respect to localized NOx, CO, PM_{10}, $PM_{2.5}$, and TACs.

Impact 4.2-3a Determination: *The* ***overall site cleanup*** *would not result in the exposure of sensitive receptors to substantial pollutant concentrations. This impact would be* ***less than significant****.*

Initial Project Assessment

Impact 4.2-3b: Would the **initial activities** expose sensitive receptors to substantial pollutant concentrations of CO, NOx, PM_{10}, $PM_{2.5}$, and TACs?

Initial Activities (Impact 4.2-3b)

As discussed in Section 3.7, *Initial Activities*, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

CO Hotspots

The initial activities would result in peak-hour traffic conditions similar to that of the overall site cleanup. There would be fewer worker trips, which could reduce peak-hour trips from those identified in Table 3.4-16. As shown previously for the overall site cleanup, the maximum daily traffic generated at the intersection of Topanga Canyon Boulevard and Burbank Boulevard is

81,730 vehicles. Because none of the intersections would exceed 200,000 vehicles per day, and the initial activities would result in slightly less peak-hour trips, CO emissions from these vehicles would be less than significant.

Localized Construction Air Quality Impacts – Criteria Pollutants

The daily onsite construction emissions generated by the initial activities were evaluated against SCAQMD's LSTs for a 2-acre site as a screening-level analysis to determine whether the emissions would cause or contribute to adverse localized air quality impacts.[13] The nearest offsite sensitive receptors are the residential communities located approximately 1 mile north of the site; 0.3 mile east of the site; and in Bell Canyon located directly south of the project site. The Bell Canyon residences are approximately 0.5 mile from the nearest areas of onsite disturbance. Scattered residences are also located approximately 1 mile west of the site (see Figure 4.2-2). Because the mass rate look-up tables provided by SCAQMD only provide specific LSTs for receptor distances of 82, 164, 328, 656, and 1,640 feet, the LSTs for a receptor distance of 1,213 feet (400 meters) was interpolated from the provided thresholds for 656 and 1,640 feet and used to evaluate the potential localized air quality impacts associated with the initial activities peak-day construction emissions. **Table 4.2-18** identifies the daily localized onsite emissions that are estimated to occur during the initial activities greatest degree of potential impact scenario prior to implementation mitigation.

TABLE 4.2-18
INITIAL ACTIVITIES LST ANALYSIS

	NO_x	CO	PM_{10}	$PM_{2.5}$
Unmitigated Emissions	128	157	75	28
Threshold	131	5,045	114	53
Significant?	No	No	No	No

SOURCE: ESA, 2017a (see Appendix D).

As shown, the daily emissions generated onsite by the initial activities greatest degree of potential impact scenario would not exceed the applicable SCAQMD LST for NO_X, CO, PM_{10}, or $PM_{2.5}$. Therefore, localized impacts from criteria pollutants for the initial activities would be less than significant.

Health Impact Assessment - Localized Effects

The potential for the initial activities to cause or contribute to exceedances of the health-based ambient air quality standards on a localized basis is discussed in detail under Impact 4.2-3a, above and was determined to be less than significant for the overall site cleanup. Because the initial activities would result in fewer emissions than the overall site cleanup, the localized health impacts from the initial activities would be similar to or less than the overall site cleanup. The

[13] According to SCAQMD's LST methodology, LSTs are only applicable to the onsite construction emissions that are generated by a project and do not apply to emissions generated offsite such as mobile emissions on roadways from worker, vendor, and truck trips.

Health Impact Assessment is provided for informational purposes only and does not influence the significance determination.

Localized Construction Air Quality Impacts – Onsite TACs

For the purposes of CEQA, DTSC has established thresholds of significance applicable to the project for TAC emissions during implementation of the initial activities. The significance criteria and analysis of potential impacts related to TAC emissions are provided in Section 4.7, *Hazards and Hazardous Materials*, of this PEIR. As shown in Table 4.7-4, the unmitigated health risk from exposure to the TACs from the initial activities would be less than significant and mitigation measures would not be required.

> Conclusion: The initial activities would not result in in significant CO impacts or impacts with respect to localized NOx, CO, PM_{10}, $PM_{2.5,}$ and TACs impacts would be less than significant.

Impact 4.2-3b Determination: *The* ***initial activities*** *would not result in the exposure of sensitive receptors to substantial pollutant concentrations. This impact would be* ***less than significant.***

4.2.5.4 Federal and State Ambient Air Quality Standards

Program Assessment

Impact 4.2-4a: Would the **overall site cleanup** result in a cumulatively considerable net increase of any criteria pollutant for which the region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Overall Site Cleanup (Impact 4.2-4a)

SSFL is located within the SCCAB, which is considered the cumulative study area for air quality. Because the SCCAB is currently classified as a state nonattainment area for ozone and PM_{10}, cumulative development consisting of the project along with other reasonably foreseeable future projects in the SCCAB as a whole could violate an air quality standard or contribute to an existing or projected air quality violation. However, based on VCAPCD's cumulative air quality impact methodology, if a project is determined to be inconsistent with the AQMP, it is also determined to have significant cumulative adverse air impacts. As identified for Impact 4.2-1a above, the overall site cleanup would not be consistent with the AQMP and therefore would result in a cumulatively considerable air impact under VCAPCD's methodology.

The site is located adjacent to the SCAB, and therefore the SCAB is also considered part of the cumulative study area for air quality. Because the SCAB is currently classified as a state nonattainment area for ozone, PM_{10}, and $PM_{2.5}$, cumulative development consisting of the overall site cleanup along with other reasonably foreseeable future projects in the SCAB as a whole could violate an air quality standard or contribute to an existing or projected air quality violation. However, based on SCAQMD's cumulative air quality impact methodology, SCAQMD

recommends that if an individual project results in air emissions of criteria pollutants (VOC, CO, NO_X, SO_X, PM_{10}, and $PM_{2.5}$) that exceed the SCAQMD's recommended daily thresholds for project-specific impacts, then it would also result in a cumulatively considerable net increase of these criteria pollutants for which the region is in nonattainment under an applicable federal or state ambient air quality standard. As shown in Tables 4.2-9 and 4.2-10 for Impact 4.2-2a, emissions from the overall site cleanup would not exceed SCAQMD's daily thresholds with implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, HAZ-2, and TRANS-1. Therefore, emissions would not result in a significant and unavoidable cumulative impact with respect to the violation of an air quality standard or contribute to an existing or projected air quality violation within the SCAQMD.

As shown in Table 4.2-16, CO emissions from vehicles would be less than significant under the cumulative plus project scenario and, therefore, the overall site cleanup would not have a cumulative impact relative to CO hotspots.

As discussed for Impact 4.2-5a, the overall site cleanup would emit odors during remediation activities that could be a temporary source of nuisance to adjacent uses. However, this would be localized and temporary, and not affect a substantial number of people. Odors would not result in a cumulative impact for the overall site cleanup.

> Conclusion: The overall site cleanup would result in a cumulatively considerable net increase of NOx within the SCCAB. Because mitigation would not sufficiently reduce emissions, this impact would be significant and unavoidable.

Impact 4.2-4a Determination: *The* ***overall site cleanup*** *would result in a cumulatively considerable impact for NOx. This impact would be* ***significant and unavoidable****. Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, HAZ-2, and TRANS-1 would be required.*

Initial Project Assessment

Impact 4.2-4b: Would the **initial activities** result in a cumulatively considerable net increase of any criteria pollutant for which the region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Initial Activities (Impact 4.2-4b)

As discussed in Section 3.7, *Initial Activities*, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure

- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The site is located within the SCCAB, which is considered the cumulative study area for air quality. Because the SCCAB is currently classified as a state nonattainment area for ozone and PM_{10}, cumulative development consisting of the initial activities along with other reasonably foreseeable future projects in the SCCAB as a whole could violate an air quality standard or contribute to an existing or projected air quality violation. However, based on VCAPCD's cumulative air quality impact methodology, if a project is determined to be inconsistent with the AQMP it is also determined to have significant cumulative adverse air impacts. As identified for Impact 4.2-1b, the initial activities would not be consistent with the AQMP and therefore would result in a cumulatively considerable air quality impact under VCAPCD's methodology.

The site is located adjacent to the SCAB; therefore, the SCAB is considered part of the cumulative study area for air quality. Because the SCAB is currently classified as a state nonattainment area for ozone, PM_{10}, and $PM_{2.5}$, cumulative development consisting of the initial activities along with other reasonably foreseeable future projects in the SCAB as a whole could violate an air quality standard or contribute to an existing or projected air quality violation. However, based on SCAQMD's cumulative air quality impact methodology, SCAQMD recommends that if an individual project results in air emissions of criteria pollutants (VOC, CO, NO_X, SO_X, PM_{10}, and $PM_{2.5}$) that exceed the SCAQMD's recommended daily thresholds for project-specific impacts, then it would also result in a cumulatively considerable net increase of these criteria pollutants for which the project region is in nonattainment under an applicable federal or state ambient air quality standard. As shown in Tables 4.2-14 and 4.2-15 for Impact 4.2-2b, emissions from the initial activities would exceed SCAQMD's daily thresholds for NOx, resulting in a potentially significant and therefore potentially cumulative impact. Implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, HAZ-2, and TRANS-1 would reduce NOx impacts to below regulatory significance levels. Therefore, emissions would result in a less-than-significant cumulative impact to the violation of an air quality standard or contribute to an existing or projected air quality violation.

As shown in Table 4.2.2-16, CO emissions from vehicles would be less than significant under the cumulative plus project scenario and, therefore, the initial activities would not have a cumulative impact relative to CO hotspots.

As discussed under Impact 4.2-5b, the initial activities would emit odors that could be a temporary source of nuisance to adjacent uses. However, this would be localized and temporary, and not affect a substantial number of people. Odors would not result in a cumulative impact for the initial activities.

Conclusion: The initial activities would result in a cumulatively considerable net increase of NOx in the SCCAB. Because mitigation would not sufficiently reduce the impact, this impact would be significant and unavoidable.

Impact 4.2-4b Determination: *The **initial activities** would result in a cumulatively considerable impact for NO_x. This impact would be **significant and unavoidable**. Mitigation Measures AQ-1, AQ-2, BIO-5, GHG-1 through GHG-3, HAZ-2, and TRANS-1 would be required.*

4.2.5.5 Objectionable Odors

Program Assessment

Impact 4.2-5a: Would the **overall site cleanup** create objectionable odors affecting a substantial number of people?

Overall Site Cleanup (Impact 4.2-5a)

During remediation, exhaust from equipment may produce discernible odors typical of most construction sites. Such odors could be a temporary nuisance to adjacent uses, but would be intermittent and would not affect a substantial number of people. Additionally, odors dissipate with distance. The remediation activities are designed to sequester VOC emissions and limit any emissions from the contaminated soils or groundwater. Therefore, these emissions would be minimal. While not mandatory to reduce impacts to less than significant, implementation of Mitigation Measure HAZ-2 would reduce the potential for odors associated with the overall site cleanup to leave the site, further reducing the potential nuisance impacts to offsite residents. Mitigation Measure HAZ-2 would reduce odor emissions by sealing some soils potentially contaminated with VOCs within sealed containers.

The nearest offsite sensitive receptors are the residential communities located approximately 1 mile north of the site, 0.3 mile east of the site, and in Bell Canyon located directly south of the project site. The Bell Canyon residences are approximately 0.5 mile from the nearest areas of onsite disturbance. Scattered residences are also located approximately one mile west of the site. Because odors associated with the overall site cleanup would be temporary and would be located more than 0.3 mile from the nearest receptor, this odor source would not have the potential to affect a substantial number of people. Therefore, impacts related to odors from remediation activities would be less than significant.

Conclusion: The overall site cleanup would not result in odors that have the potential to impact a substantial number of people. Therefore, this impact would be less than significant. No mitigation is required.

Impact 4.2-5a Determination: *The **overall site cleanup** would not result in odors that would impact a substantial number of people. This impact would be **less than significant.***

Initial Project Assessment

Impact 4.2-5b: Would the **initial activities** create objectionable odors affecting a substantial number of people?

Initial Activities (Impact 4.2-45b)

As discussed in Section 3.7, *Initial Activities*, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

During the initial activities, exhaust from equipment may produce discernible odors typical of most construction sites. Impacts from odors during the initial activities would be the same as those identified under the overall site cleanup, and would be less than significant.

> Conclusion: The initial activities would not result in odors that have the potential to impact a substantial number of people. Therefore, this impact would be less than significant. No mitigation is required.

Impact 4.2-5b Determination: *The* ***initial activities*** *would not result in odors that would impact a substantial number of people. This impact would be* ***less than significant****.*

4.2.5.6 Valley Fever

Program Assessment

Impact 4.2-6a: Would the **overall site cleanup** trigger the release and propagation of spores from *Coccidioides immiti*, a fungus known for causing Valley Fever?

Overall Site Cleanup (Impact 4.2-6a)

Valley Fever is an infective disease caused by the fungus, *Coccidioides immiti*. Infection occurs via inhalation of *Coccidioides immiti* spores that have become airborne from the upturn of dry, dusty soil by wind, construction, farming, or other activities. The overall site cleanup would be consistent with the VCAPCD's and SCAQMD's Rule 55 and Rule 403, respectively. Abidance by both the local and regional AQMPs ensures that fugitive dust would be minimized by means of regularly watering excavation areas, covering truck loads, curtailing operations during high

winds, and weekly monitoring conducted by the construction manager. The site may also be subject to soil stabilization and roll-compaction if deemed necessary. Workers involved in operations would be advised to wear proper respiratory protection and trucks leaving the site would be submitted to decontamination pods and undercarriage/wheel washers, as described in Mitigation Measure AQ-3.

Procedures for reducing the potential for minimizing the potential for Valley Fever to spread are based on procedures for handling hazardous materials and Ventura County's Initial Study Guidelines. Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1 would minimize the effects of hazardous materials cleanup. Consequently, these measures would also minimize the risk of infection and spreading of *Coccidioides immiti*.

Risk of exposure is further reduced by the setting of the project site and its distance from sensitive receptors. *Coccidioides immiti* grows in undisturbed, unfertilized areas usually away from developments. The site area is partially developed with paved roads and buildings, although there are some locations that could possibly harbor *Coccidioides immiti* growth. The nearest sensitive receptors are located 1-mile north, 0.3-mile east, and 0.5-mile south in Bell Canyon. Additionally, most (60 percent) of individuals are asymptomatic and require no medical attention from being exposed to the spores (County of Los Angeles, 2015). Controlled construction practices to prevent fugitive dust make the spreading of Valley Fever to surrounding communities unlikely.

Onsite workers are the most at risk of contracting Valley Fever. The project site contains area of dry, undisturbed soil and is prone to gusts of wind that have the potential to spread the spores. As stated earlier, VCAPCD's Rule 55 advises workers to wear proper respiratory protection during the cleanup, but excavation of topsoil and wind gusts could carry spores to other areas of the site and reach workers indirectly involved. Therefore, Valley Fever may have a significant, but mitigable, impact to onsite workers. Mitigation Measure AQ-6 (Valley Fever Minimization) would reduce the impact to workers and the surrounding community to be less than significant.

> Conclusion: The overall site cleanup would not result in the release or propagation of *Coccidioides immiti* spores outside of the project site. There is potential for onsite workers to be exposed to spores, however with implementation of Mitigation Measure AQ-6, impacts would be reduced to less than significant.

Impact 4.2-6a Determination: *The* ***overall site cleanup*** *would implement fugitive dust control practices in accordance with VCAPCD Rule 55 and SCAQMD Rule 403 and would not be expected to result in spreading Valley Fever to surrounding communities with implementation of Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1. Implementation of Mitigation Measure AQ-6 would reduce the potential for onsite workers to be exposed. This impact would be* ***less than significant with mitigation incorporated.***

Initial Project Assessment

Impact 4.2-6b: Would the **initial activities** trigger the release and propagation of spores from *Coccidioides immiti*, a fungus known for causing Valley Fever?

Initial Activities (Impact 4.2-6b)

As discussed in Section 3.7, *Initial Activities*, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

With the exception of the post-closure maintenance activities, the initial activities described in Section 3.7 would involve soil excavation and disposal, and building demolition, in certain portions of all four administrative areas. As explained in the overall site cleanup discussion (Impact 4.2-6a), the initial activities would be subject to the same procedures, guidelines, and regulations outlined by DTSC, SCAQMD, and VCAPCD. Controlled construction practices to prevent fugitive dust make the spread of Valley Fever to surrounding communities unlikely. While there is potential for exposure of onsite workers, implementation of Mitigation Measure AQ-6 would reduce the impact to less than significant.

> Conclusion: The initial activities would not result in the release or propagation of *Coccidioides immiti* spores outside of the project site. There is the potential for onsite workers to be exposed to spores; however, with implementation of Mitigation Measure AQ-6, impacts would be reduced to a less than significant.

Impact 4.2-6b Determination: *The **initial activities** would implement fugitive dust control practices in accordance with VCAPCD Rule 55 and SCAQMD Rule 403 and would not be expected to result in spreading Valley Fever to surrounding communities with implementation of Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1. Implementation of Mitigation Measure AQ-6 would reduce the potential for onsite workers to be exposed. This impact would be **less than significant with mitigation incorporated**.*

4.2.6 Mitigation Measures[14]

Alternative-fueled equipment, including currently commercially available equipment powered by biodiesel, natural gas, and electric engines, were evaluated in detail as potential strategies to reduce emissions, and were determined to not be feasible for implementation for this project. A discussion of the infeasibility of alternative-fueled equipment for this project is provided in the *Santa Susana Field Laboratory Project PEIR Feasibility of Alternative-Fueled Construction Equipment and Trucks Memorandum*, which is provided in Appendix D of this PEIR (ESA, 2017a). As detailed in this memorandum, while alternative fuels and associated alternative-fueled equipment are available, such fuels and equipment are not feasible for implementation for this project based on the current availability and emissions reduction potential for these technologies. Although the use of biodiesel would decrease PM emissions, biodiesel would not decrease, and in fact may slightly increase, NOx emissions. Therefore, biodiesel would not be feasible for this project as it may cause an increase in an identified significant air quality impact. Compressed or liquefied natural gas (CNG/LNG) trucks are available, but lack the torque (power output) needed for hauling materials from the project site to appropriate receiver facilities and would not be feasible for this project. In addition, electric engines were considered; however, due to the daily relocation of equipment throughout the project site and the need for trucks to travel long distances away from the project site, lack of charging stations in proximity to daily cleanup locations, and downtime for recharging, electric equipment was determined to be not feasible for this project. As a result, there are currently no feasible mitigation measures related to alternative-fueled equipment that would further reduce emissions of air pollutants beyond those measures already incorporated into the project analysis. However, as technology advances, viable alternatives to the diesel powered on-road or off-road equipment needed to implement the project may become commercially available.

Given the above, the following measures shall be implemented to mitigate impacts related to air quality:

BIO-5: Revegetation Plan (see Section 4.3.6 for description).

GHG-1: Recycling Requirement (see Section 4.6.6).

GHG-2: On-road Vehicle Fleet Requirements (see Section 4.6.6).

GHG-3: Greenhouse Gas Emissions Reduction Plan (see Section 4.6.6).

HAZ-1: Health and Safety Plan (see Section 4.7.6).

HAZ-2: Hazardous Materials Containment (see Section 4.7.6).

HAZ-3: Hazardous Materials Business Plan (see Section 4.7.6).

[14] Some of the mitigation measures in this section include recommendations from USEPA's: *Green Remediation: Best Management Practices for Excavation and Surface Restoration*, December 2008.

HYDRO-1: Stormwater Pollution Prevention Plan (SWPPP) (see Section 4.8.6).

HYDRO-2: Operations and Maintenance Plan (O&M) (see Section 4.8.6).

TRANS-1: Traffic Management Plan (see Section 4.11.6).

AQ-1: Tier 4 Rated Engines. All onsite equipment greater than 50 hp would be required to use Tier 4 final rated engines or have emissions levels equivalent to that of Tier 4 final rated engines (Engines that are not Tier 4 but have been retrofitted with catalytic converters and/or diesel particulate filters, such that the emissions reductions of Tier 4 engines are met).

AQ-2: Perimeter Air Monitoring Plan. The RPs, under the direction of DTSC, shall implement a perimeter air monitoring plan (AMP). The AMP includes real-time perimeter air monitoring for odors, dust, and volatile chemicals, as well as more limited time-integrated sampling for volatile chemicals and dust at the locations and frequencies outlined in the AMP, which shall be approved by DTSC. During the excavation activities, water or a similar suppressant (e.g., Soil Seal), will be applied as necessary to suppress potential dust, odors, and emissions, including volatiles. The AMP shall include action standards with corresponding actions if/when action standards are exceeded. Such actions could include additional water, the use of foam or soil binding agents, tarps, or the cessation of activities. Air monitoring logs shall be maintained onsite at all times per the AMP. A log containing dates on which action standards are triggered and response shall be maintained onsite. These logs shall be made available to DTSC and VCAPCD for inspection upon request.

AQ-3: Fugitive Dust Control. The RPs, under the direction of DTSC, shall monitor and control fugitive dust emissions by measures prescribed by VCAPCD Rule 55 and documented in an approved Soil Management Plan (see Mitigation Measure AQ-4). The RPs, under the direction of DTSC, shall work with both the VCAPCD and LARWQCB to approve the various aspects of the Soil Management Plan that may fall under multiple jurisdictions. At a minimum, the following measures shall be used to reduce both onsite and offsite fugitive dust emissions:

- To prevent wind-driven dust during operations, water spray/mists or similar suppressant (e.g., SoilSeal) shall be used during bulk material handling, earth-moving, construction and demolition activities, and vehicle movement on unpaved roads. Application of water dust suppressant shall occur at least 4 times per day on active areas of disturbance and unpaved roads. Application of a long-term soil suppressant (e.g., SoilSeal) shall be used for areas of disturbance that are inactive for more than five days.
- To prevent wind-driven dust at storage piles, inactive storage piles shall be covered with anchored plastic sheeting and use water spray/mists at active storage piles.
- To prevent soil from being tracked away from the work area, outbound trucks exporting bulk material shall remain on paved roads to the extent practicable, and if travel on unpaved roads is required, rumble strips (wheel shaking device to remove bulk material from tires and undercarriage) shall be placed at the location where the unpaved road joins paved roads. To minimize dust on unpaved roads at the site, limit speed to 15 miles per hour or less.

- To control dust emissions from outbound trucks, the entire surface area of outbound truck loads shall be covered with secured tarps or a container-type enclosure shall be used.
- To avoid fugitive dust during high wind conditions, soil disturbance activities shall be ceased, if onsite wind speeds exceeding 25 miles per hour for at least 5 minutes in an hour.
- To ensure that any visible dust emissions are controlled, an observer certified by the CARB or the USEPA shall periodically perform opacity assessments.

AQ-4: Soil Management Plan. The RPs, under the direction of DTSC, shall prepare a plan for the management of soil that contains gasoline, diesel fuel, jet fuel, or other known ROC. These soils shall be monitored and controlled by measures prescribed by VCAPCD Rule 74.29 and documented in a DTSC-approved Soil Management Plan. In addition to the fuels identified by Rule 74.29, the Soil Management Plan shall provide dust suppression for any active or inactive stockpile that is known or suspected to contain known ROC contaminants. The measures that shall be used include the following:

- To minimize emissions of ROCs to the atmosphere, active and inactive excavations and stockpiles of soil that contain gasoline, diesel fuel, jet fuel, or other known ROC contaminants, and emit ROCs in excess of 50 ppmv above background, specifically as hexane, except non-repeatable momentary readings, shall be kept visibly moist by water spray, treated with a vapor suppressant, or covered with a continuous heavy-duty plastic sheeting (4 mil or greater) or other covering. The covering shall be overlapped at the seams and securely anchored to minimize headspace where vapors could accumulate.
- Monitoring of ROC emissions from soil stockpiles shall be performed as specified in VCAPCD Rule 74.29.

AQ-5: Prohibit Idling. The RPs, under the guidance of DTSC, shall prohibit the idling of on-road and off-road heavy-duty diesel vehicles for more than 5 minutes at a time. This measure is consistent with California regulations and laws as well as CARB Air Toxics Control Measure requirements.

AQ-6: Valley Fever. During heavy grading where the top 12 to 18 inches of soil would be disturbed, construction contractors shall comply with the following measures, as feasible to reduce potential Valley Fever impacts (VCAPCD, 2003):

- Restrict employment for grading activities to persons with positive coccidioidin skin tests (since those with positive tests can be considered immune to reinfection).
- Hire crews from local populations where possible, since it is more likely that they have been previously exposed to the fungus and are therefore immune.
- Require crews to use respirators during project clearing, grading, and excavation operations in accordance with California Division of Occupational Safety and Health regulations.
- Require that the cabs of grading and construction equipment to be air-conditioned or enclosed with sufficient ventilation and particulate matter filtration systems.
- Require crews to work upwind from excavation sites where possible.

- Where acceptable to the fire department, control weed growth by mowing instead of disking, thereby leaving the ground undisturbed and with a mulch covering.
- During rough grading and construction, the access way into the project site from adjoining paved roadways should be paved or treated with environmentally-safe dust control agents.

4.2.7 Impact Summary

Table 4.2-19 summarizes the proposed project's impacts and significance determinations related to air quality.

TABLE 4.2-19
SUMMARY OF IMPACTS – AIR QUALITY

Impact	Overall Project	DOE Initial Project	NASA Initial Project	DOE Demolition Activities	RCRA Post-Closure and Facility Closure	Mitigation Measures
Impact 4.2-1a: Conflict with the implementation of Air Quality Plan	S&U	--	--	--	--	AQ-1 through AQ-5, BIO-5, GHG-1, GHG-2, GHG-3, and HAZ-2
Impact 4.2-1b: Conflict with the implementation of Air Quality Plan	--	S&U	S&U	S&U	S&U	AQ-1 through AQ-5, BIO-5, GHG-1, GHG-2, GHG-3, and HAZ-2
Impact 4.2-2a: Violate ambient air quality standard	S&U	--	--	--	--	AQ-1 through AQ-5, BIO-5, GHG-1, GHG-2, GHG-3, and HAZ-2
Impact 4.2-2b: Violate ambient air quality standard	--	S&U	S&U	S&U	S&U	AQ-1 through AQ-5, BIO-5, GHG-1, GHG-2, GHG-3, HAZ-2, and TRANS-1
Impact 4.2-3a: Expose sensitive receptors to substantial pollutant concentrations	LTS	--	--	--	--	None
Impact 4.2-3b: Expose sensitive receptors to substantial pollutant concentrations	--	LTS	LTS	LTS	LTS	None
Impact 4.2-4a: Cumulatively considerable impacts	S&U	--	--	--	--	AQ-1 through AQ-5, BIO-5, GHG-1, GHG-2, GHG-3, HAZ-2, and TRANS-1
Impact 4.2-4b: Cumulatively considerable impacts	--	S&U	S&U	S&U	S&U	AQ-1, AQ-2, BIO-5, GHG-1, GHG-2, GHG-3, HAZ-2 and TRANS-1
Impact 4.2-5a: Objectionable odors	LTS	--	--	--	--	None
Impact 4.2-5b: Objectionable odors	--	LTS	LTS	LTS	LTS	None
Impact 4.2-6a: Valley Fever	LSM	--	--	--	--	AQ-6
Impact 4.2-6b: Valley Fever	--	LSM	LSM	LSM	LSM	AQ-6

S&U = Significant and unavoidable impact
LTS = Less than significant impact
LSM = Less than significant with mitigation incorporated

4.3 Biological Resources

The purpose of this section is to evaluate potential impacts to biological resources that would occur from implementation of the overall site cleanup and the initial activities. This section identifies existing biological resources within the approximately 2,850-acre SSFL site [which includes areas that are administered by Boeing (1,927 acres), DOE (406 acres) and NASA (517 acres)] and approximately 26 acres of offsite areas (referred to collectively as the project site). This section includes a description of the applicable federal, state, regional, and local regulations and policies related to biological resources protection.

Sensitive biological resources potentially occurring in the project site were identified through queries of existing databases and agency information, including U.S. Fish and Wildlife Service (USFWS) Species List for Santa Susana Field Laboratory (USFWS, 2014), CDFW California Natural Diversity Database (CNDDB) (CDFW, 2015a), Special Animals List (CNDDB, 2015b), the California Native Plant Society (CNPS) Online Inventory (CNPS, 2015), and Locally Important Plant and Animal Lists (Ventura County, 2014a; 2014b). Other literature used to establish a baseline and analyze potential impacts to sensitive biological resources includes biological survey reports, USFWS protocol survey reports, monitoring reports, and regulatory documentation. The following list includes the most pertinent literature sources reviewed:

- Final Environmental Impact Statement for Proposed Demolition and Environmental Cleanup Activities at Santa Susana Field Laboratory (NASA, 2014a);
- Draft Biological Resources Study for the Boeing Company Santa Susana Field Laboratory Soils and Groundwater Remediation Project (Padre, 2013);
- Environmental Assessment for Cleanup and Closure of the Energy Technology Engineering Center (DOE, 2003);
- 2010 and 2011 habitat and listed species survey reports for NASA-administered property (NASA, 2011a and 2011b);
- Site Visit to Area IV to Assess the Status of Wetlands and Biological Resources (Leidos, 2014a);
- Fall Biological Survey Report for Santa Susana Field Laboratory and Northern Undeveloped Areas (SAIC, 2009a);
- Habitat assessments and species conservation recommendations for western spadefoot toad (*Spea hammondii*), vernal pool brachiopods, rare plants, and golden eagle (*Aquila chrysaetos*) within Boeing-administered areas (Padre, 2014a; 2014b; 2014c; and 2014d);
- 90-Day Report on Mid-Wet Season Fairy Shrimp Identification Survey for the Boeing Santa Susana Field Laboratory, Simi Hills, Ventura County, California (Padre, 2010);
- Site Assessment for Quino Checkerspot Butterfly SSFL Area IV (FSC, 2010);

- Habitat Assessment for the Endangered Quino Checkerspot Butterfly at the NASA-Administered Areas I and II of the Santa Susana Field Laboratory (Arnold, 2012);
- California Red-legged Frog Habitat Site Assessments Outfall 4/SRE Pond, Silvernale Pond, and Outfall 18 Ponds Santa Susana Field Laboratory Area IV and Vicinity (SAIC, 2010);
- California Gnatcatcher Habitat Assessment and Protocol Survey of Potential Habitat Within Santa Susana Field Laboratory Area IV and Northern Buffer Zone (Griffith, 2010, 2011, 2012);
- Wetlands and Waters of the United States, Delineation for the NASA-Administered Portions of the Santa Susana Field Laboratory, Ventura County, California (NASA, 2012);
- Biological Assessment, Santa Susana Field Laboratory Area IV Radiological Study (HydroGeoLogic, 2010);
- Biological Opinion and Amendment for the Santa Susana Field Laboratory Area IV Radiological Study Project, Ventura County, California Biological Opinion Amendment - Request for Authorization to Conduct Surface Water and Sediment Sampling at Point Locations with Areas II and III for the Santa Susana Field Laboratory Area IV Radiological Study (USFWS, 2010, 2011);
- Final Biological Monitoring Report 2010 – 2012, Radiological Study of the Santa Susana Field Laboratory Area IV and Northern Buffer Zone (HydroGeoLogic, 2012);
- Species List for Santa Susana Field Laboratory Areas I through IV and Adjacent Undeveloped Lands, Ventura County, California (USFWS, 2014);
- List of locally important plant and animal species (Ventura County, 2014a, 2014b); and
- Vegetation Mapping for the Site-Wide Biological Assessment for Remediation at the Santa Susana Field Laboratory (SSFL) (Leidos, 2016).

4.3.1 Environmental Setting

The project site is comprised of approximately 2,876 acres, including the 2,850-acre SSFL and an additional 26 acres of adjacent offsite areas, including the lead shot cleanup area. Proposed remediation areas within the project site would comprise 592 acres of the project site. The project site is located in southeastern Ventura County, near the crest of the Simi Hills and adjacent to the western border of the San Fernando Valley. Adjacent land uses consist of residential development to the south, undeveloped land to the north, the Santa Monica Mountains Conservancy's Sage Ranch Park and the Brandeis-Bardin Institute to the northwest, rural residential development to the east, and large tracts of undeveloped land, including Meier and Runkle Canyons, to the west.

The project site is composed of 17 sub-watersheds of the Los Angeles River and Calleguas Creek watersheds. The Los Angeles River and Calleguas Creek are considered sensitive because they are known to provide habitat for rare, threatened, or endangered species. The geology at the project site consists mainly of shallow alluvium underlain by bedrock of sandstone and siltstone. The depth of alluvium varies by location throughout the project site, with substantial portions exhibiting large sandstone outcrops (Padre, 2013). The terrain within the project site is quite hilly, varying in elevation from 333 meters (1,093 feet) AMSL at the eastern property boundary, to 687 meters (2,254 feet) AMSL near the center of the site (NASA, 2014b). The highest surface elevations at the project site exist in two general bands that extend in a northeast-southwest direction, and the lower elevations occur primarily along the eastern, southern, and north-central to northwestern perimeters of the property.

4.3.1.1 Vegetation and Land Cover Types

As shown in **Figure 4.3-1**, the majority of the project site is undeveloped, consisting mostly of chaparral, coastal sage scrub, rock outcrop, oak woodland, and a variety of native upland and aquatic habitats. Developed areas generally consist of paved and unpaved roads, existing infrastructure, and numerous intact or recently decommissioned former test facility platforms. Some of the areas that have recently undergone demolition have been hydroseeded, and some areas have been planted with native plant species (Padre, 2013). **Figure 4.3-2** and **Figures 4.3-2a** through **4.3-2d** identify the vegetation communities and other land cover types within the proposed remediation areas.

Vegetation mapping and habitat types were compiled based on the most current vegetation mapping data available for SSFL, including previous vegetation mapping efforts, desktop analysis and review of survey reports. Biologists that have conducted surveys on the project site were consulted during preparation of the vegetation map. Most of the previously mapped areas had used a modified Holland (1986) system, with limited areas using the Manual of California Vegetation 2nd edition (MCV2) (Sawyer et al., 2009). Therefore, in order to develop a habitat crosswalk of mapped vegetation communities for SSFL, the modified Holland system was used for vegetation mapping purposes, while noting the appropriate MCV2 classification where the information was available (Leidos, 2016).

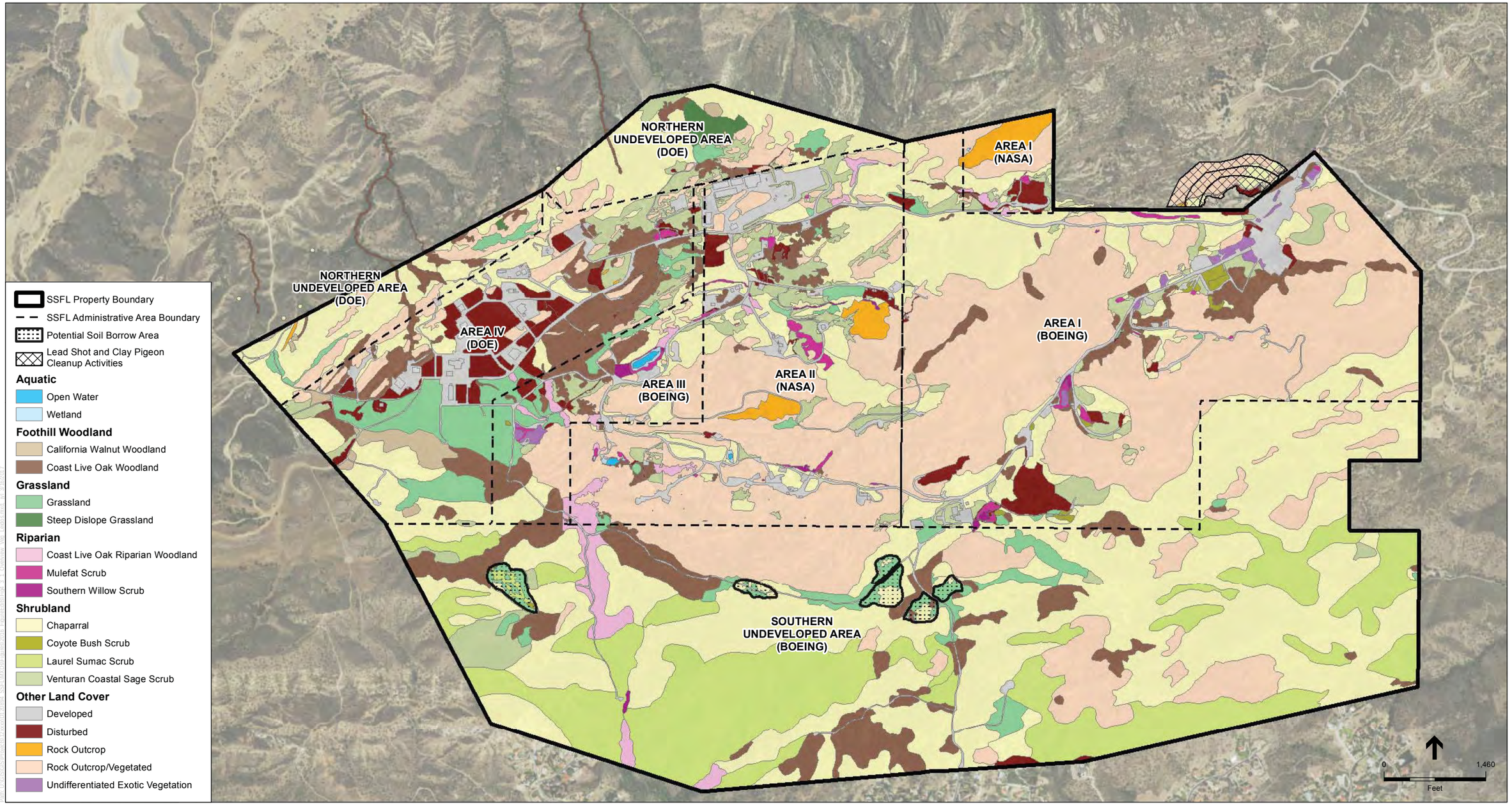
Table 4.3-1 identifies the vegetation communities and land cover types within SSFL and adjacent offsite areas. A description of each vegetation community or other land cover type is provided below based on the descriptions contained in Vegetation Mapping for the Site-Wide Biological Assessment for Remediation at the Santa Susana Field Laboratory (Leidos, 2016).

TABLE 4.3-1
VEGETATION COMMUNITIES AND LAND COVER TYPES

Vegetation Community or Land Cover Type	Rarity Ranking[1]	Acreage
Shrublands		
Chaparral	Unranked	967.1
Coyote Brush Scrub	G5S5	4.7
Laurel Sumac Scrub	G4S4	307.9
Venturan Coastal Sage Scrub	G3S3.1/LI	128.9
Foothill Woodlands		
Coast Live Oak Woodland (Upland)	G4S4/LI	223.5
Southern California Walnut Woodland	G2S2.1	13.3
Grasslands		
Grassland	Unranked	111.6
Steep Dip Slope Grassland	Unranked	7.8
Riparian		
Coast Live Oak Riparian Woodland	G4S4/LI	30.9
Mulefat Scrub	G4S4	10.6
Southern Willow Scrub	G3S2.1	3.6
Aquatic		
Open Water	Unranked	1.2
Wetland	Unranked	1.2
Other Land Cover Types		
Rock Outcrop/Vegetated	Unranked	821.7
Rock Outcrop	Unranked	22.9
Disturbed	Unranked	69.9
Developed	N/A	142.2
Undifferentiated Exotic Vegetation	Unranked	6.5
Total		**2,875.5**

CNDDB Element Ranking
Global Ranking
G1 = Less than 6 viable element occurrences (EOs) OR less than 1,000 individuals OR less than 2,000 acres.
G2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres.
G3 = 21-80 EOs OR 3,000-10,000 individuals OR 10,000-50,000 acres.
G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.
State Ranking
S1 = Less than 6 EOs OR less than 1,000 individuals OR less than 2,000 acres
S2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres
S3 = 21-80 EOs or 3,000-10,000 individuals OR 10,000-50,000 acres
S4 = Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat.
S5 = Demonstrably secure to ineradicable in California.
State Threat
.1 = very threatened
.2 = threatened
.3 = no current threats known

Local Ranking
LI = Locally Important as defined by Ventura County
SOURCE: Leidos, 2016.

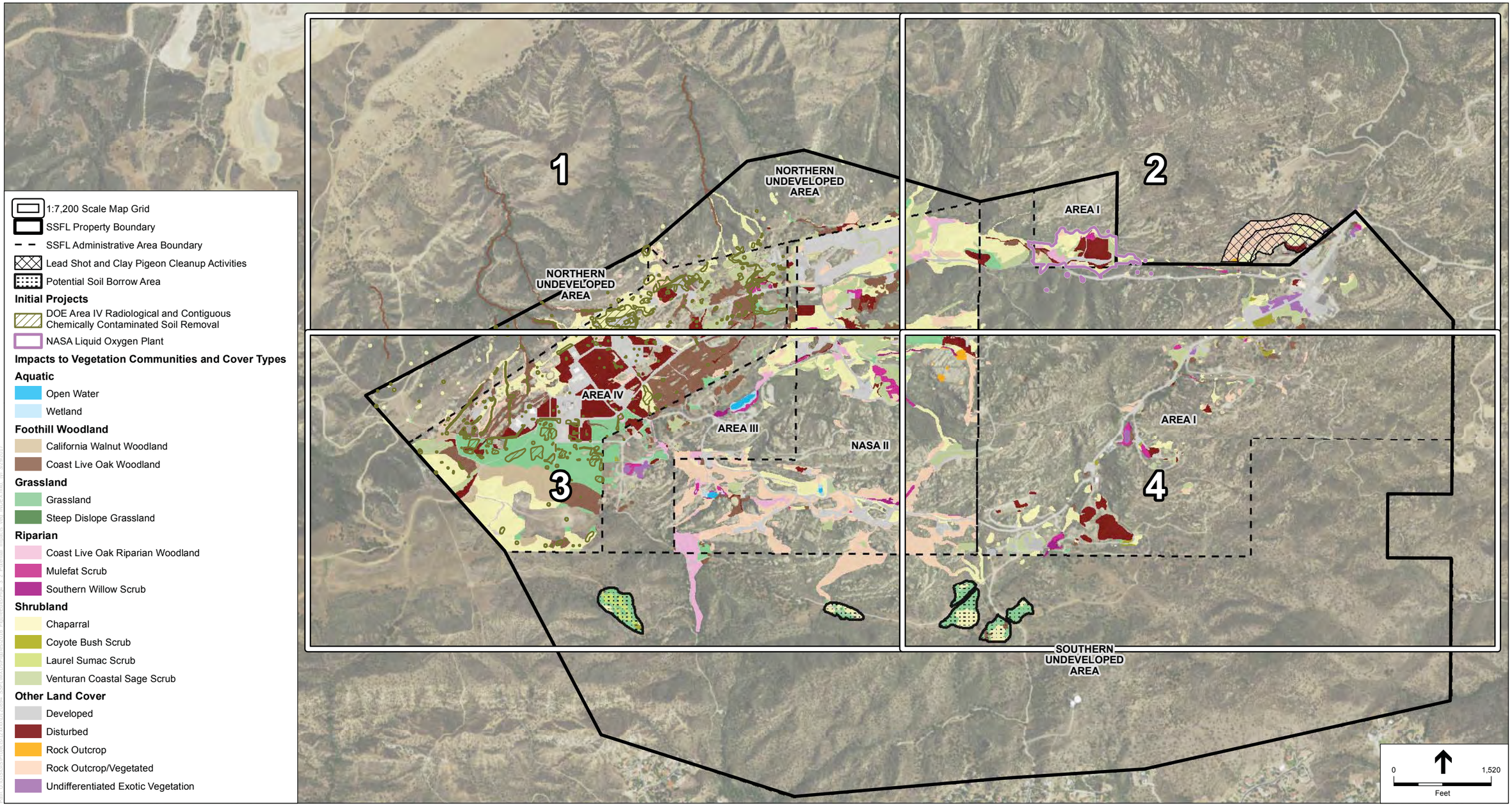


SOURCE:ESA 2016; Leidos August 2016

Santa Susana Field Laboratory.120894

Figure 4.3-1

Overview of Vegetation Communities and Land Cover Types



SOURCE: Boeing 2016; NASA 2016; DOE 2012

Santa Susana Field Laboratory.120894

Figure 4.3-2

Potential Impacts to Habitat Types - Index Map

SSFL Property Boundary
SSFL Administrative Area Boundary
DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
Radioactive Materials Handling Facility (RMHF)
Permitted RMHF Feature
Hazardous Waste Management Facility (HWMF)

Impacts to Vegetation Communities and Cover Types

Foothill Woodland
- Coast Live Oak Woodland

Grassland
- Grassland
- Steep Dislope Grassland

Riparian
- Mulefat Scrub

Shrubland
- Chaparral
- Venturan Coastal Sage Scrub

Other Land Cover
- Developed
- Disturbed
- Rock Outcrop
- Rock Outcrop/Vegetated

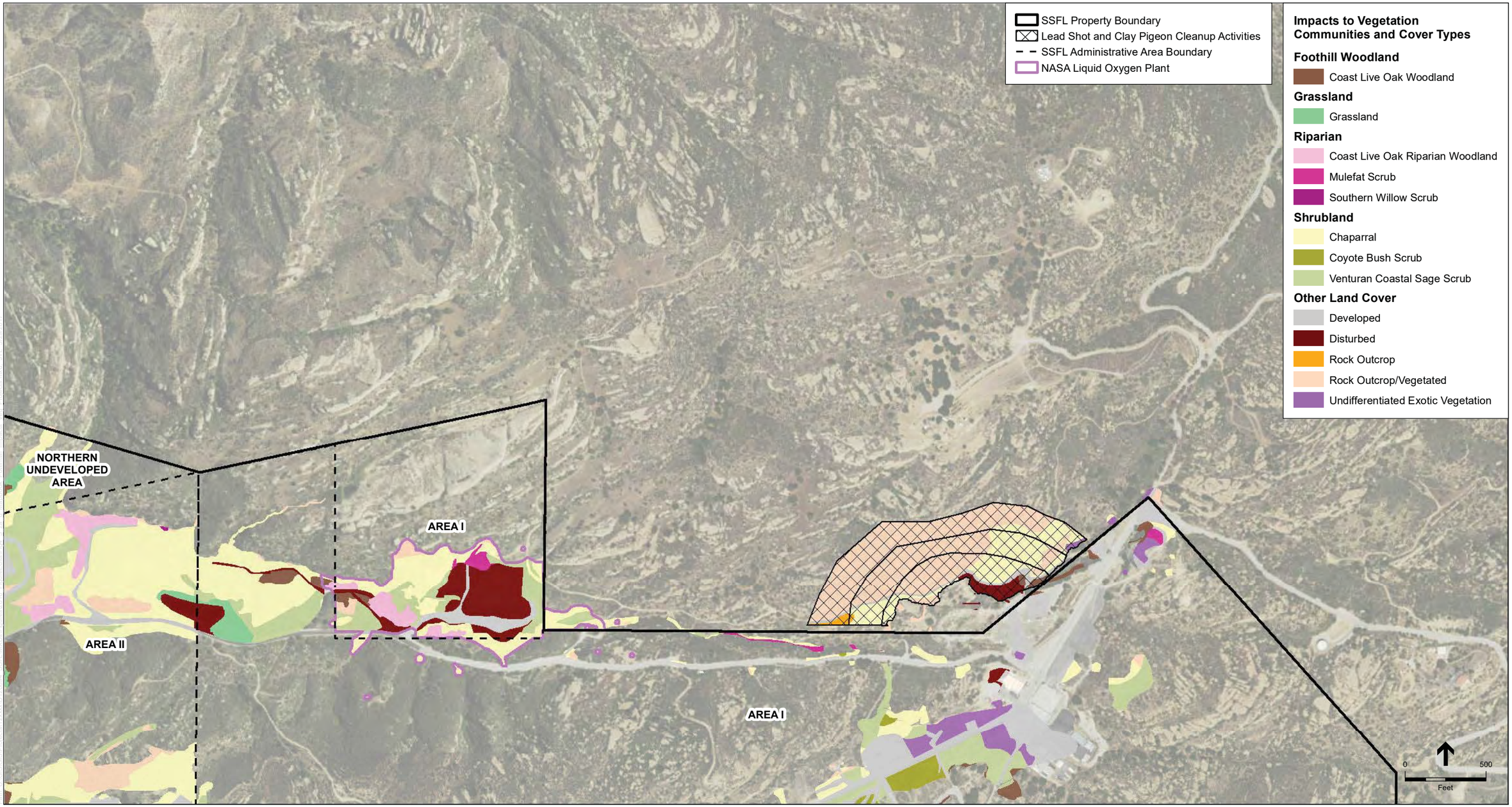
NORTHERN UNDEVELOPED AREA
NORTHERN UNDEVELOPED AREA
AREA III
AREA II
AREA IV
Staging Area
Main Staging Area
HWMF
0
500
Feet

SOURCE: Boeing 2016; NASA 2016; ESA 2016

Santa Susana Field Laboratory.120894

Figure 4.3-2a

Potential Impacts to Habitat Types - Map 1 of 4

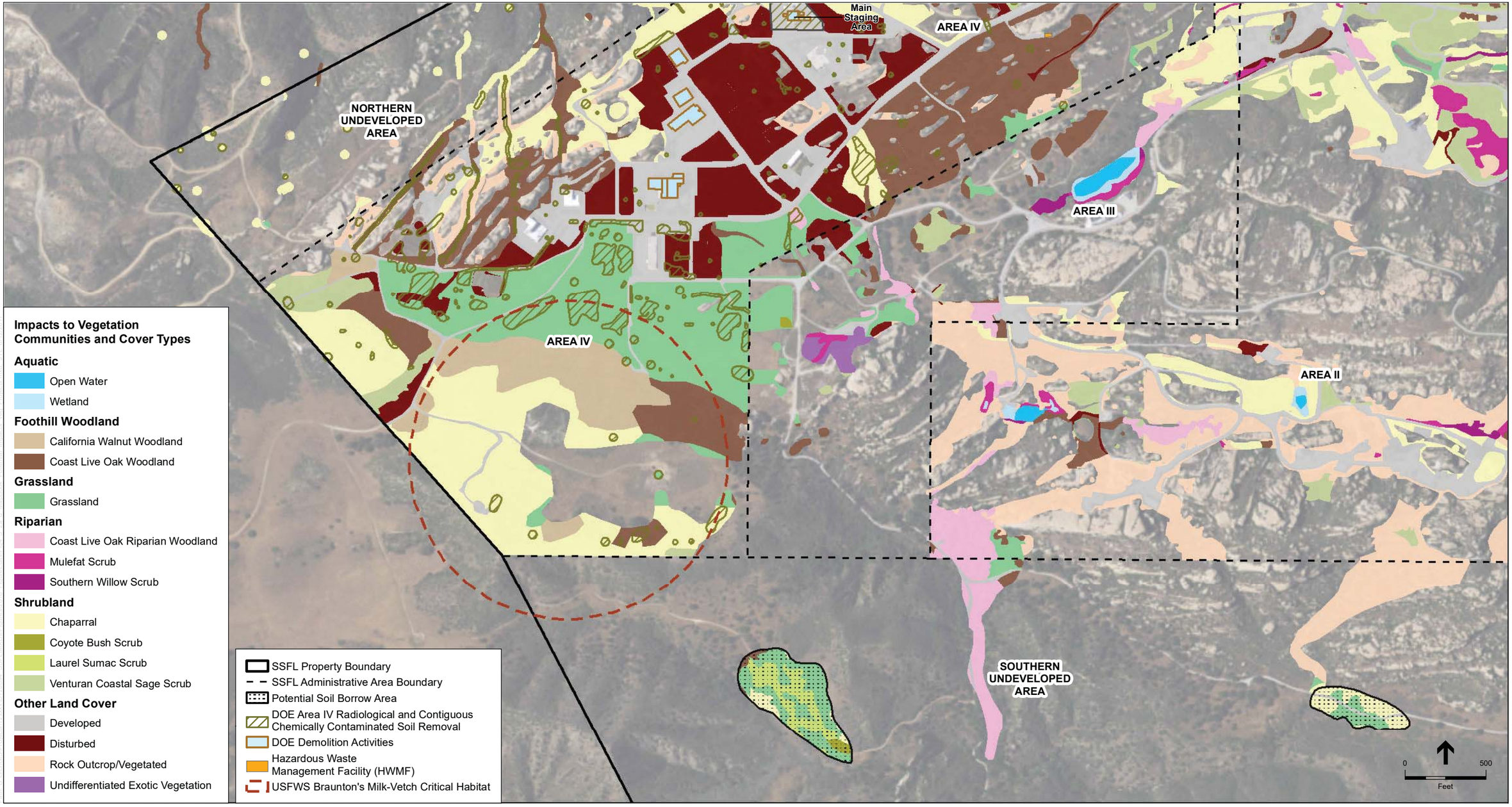


SOURCE: Boeing 2016; NASA 2016; ESA 2016

Santa Susana Field Laboratory.120894

Figure 4.3-2b

Potential Impacts to Habitat Types - Map 2 of 4

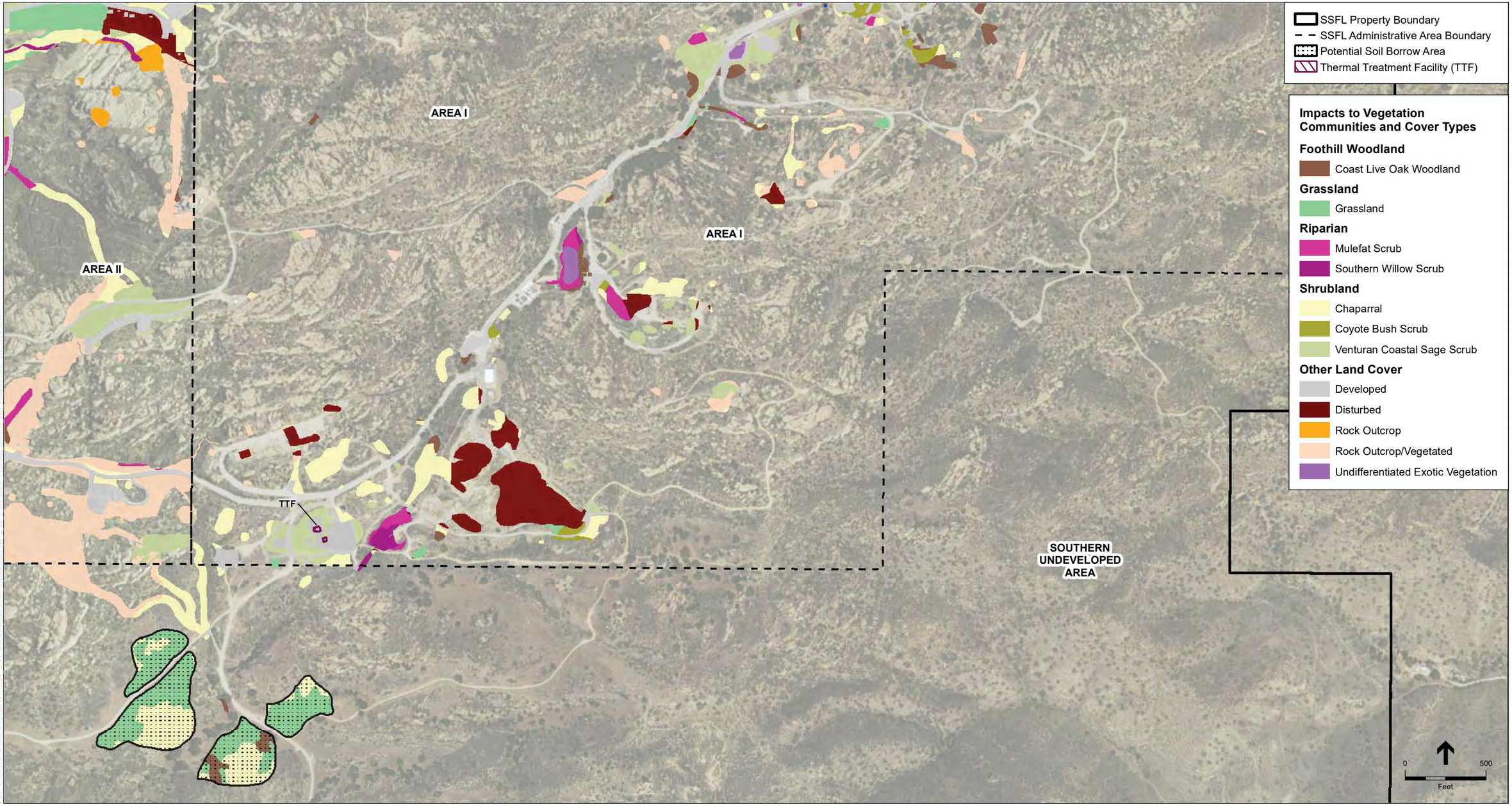


SOURCE: Boeing 2016; NASA 2016; ESA 2016

Santa Susana Field Laboratory.120894

Figure 4.3-2c

Potential Impacts to Habitat Types - Map 3 of 4



SOURCE: Boeing 2016; NASA 2016; ESA 2016

Santa Susana Field Laboratory.120894

Figure 4.3-2d

Potential Impacts to Habitat Types - Map 4 of 4

Shrublands

Chaparral

Chaparral is particularly well-developed in the Northern Undeveloped Area, Southern Undeveloped Area and other undeveloped portions of the project site. Chaparral consists of large woody shrubs that form a dense canopy. The dominant species vary in different portions of the site depending on how much time has passed between disturbances, such as fire or vegetation removal, as well as slope aspect and soil conditions. Large portions of the project site burned in 2005 with variable intensity in different portions of the site, as well as varying degree of burning, with some areas not burned at all. Chaparral is a fire-adapted community with many of the dominant species able to resprout following a fire. The result of the fire combined with the natural variability of dominant species in chaparral communities has resulted in a mosaic of chaparral in various stages of maturity with dominant species that may include one or more species. The plant species associated with chaparral at the site include chamise (*Adenostoma fasciculatum*), laurel sumac (*Malosma laurina*), sugar bush (*Rhus ovata*), several species of ceanothus (*Ceanothus crassifolius, C. oliganthus*, *C. cuneatus*, and C. *megacarpus*), birch leaf mountain mahogany (*Cercocarpus betuloides*), yerba santa (*Eriodictyon crassifolium*), holly-leaf cherry (*Prunus ilicifolia*), holly leaf redberry (*Rhamnus ilicifolia*), bigberry manzanita (*Arctostaphylos glauca*), chaparral yucca (*Hesperoyucca whipplei*), and poison oak (*Toxicodendron diversilobum*). Smaller shrub species that are also typical of scrub communities are often associated or co-dominant with the chaparral species including black sage (*Salvia mellifera*), purple sage (*Salvia leucophylla*), bush mallow (*Malacothamnus fasciculatus*), and California sagebrush (*Artemisia californica*). Other subshrubs and perennials mixed with the chaparral species include coastal deerweed (*Acmispon glaber*), sticky snapdragon (*Antirrhinum multiflorum*), and Malibu baccharis (*Baccharis malibuensis*). Braunton's milk-vetch (*Astragalus brauntonii*), a federally-listed endangered species, became one of the dominant plants in localized portions of burned chaparral in Area IV following the 2005 Topanga fire. Chaparral is one of the most abundant habitat types on the project site, occupying 33.5 percent of the land cover.

MCV2 vegetation alliances within the chaparral community include the following*: Adenostoma fasciculatum* shrubland alliance (chamise chaparral), *Adenostoma fasciculatum-Salvia mellifera* shrubland alliance (chamise-black sage chaparral), *Cercocarpus betuloides* shrubland alliance (birch-leaf mountain mahogany chaparral), *Ceanothus spinosus* shrubland alliance (green-bark ceanothus chaparral), **Prunus ilicifolia* shrubland alliance (holly-leaf cherry chaparral), **Eriodictyon crassifolium* provisional shrubland alliance (thick leaf yerba santa scrub) and possibly other alliances depending on which species are dominant or co-dominant. In addition, the *Adenostoma fasciculatum* shrubland alliance (chamise chaparral) include several plant species associations where chamise is co-dominant with one or a combination of species or plant types that occur at the site including *Malosma laurina*, *Eriodictyon crassifolium,* several species of *Ceanothus* or *Arctostaphylos, Eriogonum fasciculatum, Selaginella bigelovii.* annual grasses, forbs, or mixed herbs and moss.

* Considered a rare or high-priority vegetation type (CDFG, 2010).

Laurel Sumac Scrub

Laurel Sumac Scrub is visually dominated by laurel sumac, a large evergreen shrub that resprouts vigorously after fire or other disturbance. Much smaller, mostly drought-deciduous shrubs and grasses occupy the relatively large interspaces between the individual laurel sumacs. Associated species vary from location to location (Sawyer et al. 2009) and at least some of the variability from site to site relates to differential recovery of species after fire or other disturbance. Associated species include California buckwheat (*Eriogonum fasciculatum*), coastal deerweed, coast bush sunflower (*Encelia californica*), wishbone bush (*Mirabilis californica*), chaparral yucca, with the occasional chamise, black sage, purple sage, California sagebrush, and introduced annual grasses. At a few sites, introduced annual grasses occupy the intervening spaces with few or no shrubs. The disparity in size between the laurel sumac and the much smaller plants in the intervening spaces as well as the spacing between individual laurel sumac plants gives Laurel Sumac Scrub a savanna-like appearance. Laurel Sumac Scrub occupies 10.8 percent of the land cover of project site and is prevalent in the Southern Undeveloped Area, where it dominates steep to relatively gentle slopes with a southerly exposure. Laurel sumac is sensitive to cold temperatures at higher elevations and inland sites (Davis et al., 2007; Rundel, 2007), which likely causes it to be most prevalent at SSFL on warmer southerly exposures. Laurel sumac is also prevalent in chaparral on the site.

The MCV2 vegetation alliance associated with laurel sumac scrub is *Malosma laurina* shrubland alliance (laurel sumac scrub). However, the MCV2 indicates membership in this type applies where the relative cover of laurel sumac is greater than 50 percent when dominant in the shrub canopy, or greater than 30 percent when co-dominant with California buckwheat or black sage, this may not apply to all project areas currently included as laurel sumac scrub.

Venturan Coastal Sage Scrub

Areas dominated by native soft-leaved (malacophyllous) shrub species including black sage, purple sage, California sagebrush, California buckwheat, as well as coastal deerweed, chaparral yucca, bush mallow, and giant wild rye (*Elymus condensatus*) are included in the Venturan Coastal Sage Scrub vegetation type. This type appears to be associated with gradual south facing slopes as well as areas that may be transitional to recovering chaparral or between chaparral and other vegetation types, such as woodland habitats. Venturan coastal sage scrub occupies 4.5 percent of land cover of the site, although surveys in remote areas are needed. This community is considered by the CDFW and Ventura County as a locally important and sensitive natural community.[1]

[1] Sensitive habitats include sensitive natural communities that are designated as such by the CDFW, as well as habitats afforded protection by federal, state and/or local policies and regulations. Sensitive habitats are generally considered to have important functions or values for wildlife and/or are recognized as declining in extent or distribution, and are considered threatened enough to warrant some level of protection.

MCV2 vegetation alliances within the Venturan coastal sage scrub community include the following: *Salvia mellifera* shrubland alliance (black sage scrub), *Malacothamnus fasciculatus* shrubland alliance (bush mallow scrub), *Artemisia californica* shrubland alliance (California sagebrush scrub), and possibly other types depending on which species are dominant or co-dominant.

Coyote Brush Scrub

Areas identified as coyote brush scrub are dominated by coyote brush (*Baccharis pilularis*), which can be relatively dense forming nearly pure stands or relatively sparse in more disturbed sites. On the project site, this vegetation type is often observed in areas recovering from disturbance including those undergoing active revegetation. Coyote brush is also found in the understory or in the buffer between uplands and riparian and wetland areas. Coyote brush scrub occupies 0.1 percent of the land cover on the site.

The MCV2 vegetation alliance associated with this community is the *Baccharis pilularis* shrubland alliance (coyote brush scrub).

Rock Outcrops/Vegetated

Very large sandstone outcrops of the Chatsworth Formation (Squires, 1997) conspicuously dominate portions of the SSFL landscape, especially in Areas I, II, and III and the undeveloped areas of the Northern Undeveloped Area (see Section 4.1, *Aesthetics*, of this PEIR for a detailed description of the local landscape). In the northern portion of Area IV, some outcrops extend across the landscape at or near the soil level and others reach up to 40 or more feet above the soil level. In general, these occur as wide, linear features, as the outcrops form in natural rows. Vegetation occurs on and around the edges as well as in the interspaces between outcrops. In Areas I, II, and III, much of the elevated terrain of the site is composed of Chatsworth Formation sandstone outcrops and is classified as Rock Outcrops/Vegetated. Plants growing on the outcrops consist of shrubs common to the chaparral or Venturan coastal sage scrub vegetation types and may also include native or non-native grasses and herbaceous species. There is also an occasional coast live oak (*Quercus agrifolia*) tree present. The Santa Susana tarplant (*Deinandra minthornii*), a state-listed rare species, is very closely associated with this vegetation type and is commonly found in crevices in the bedrock outcrops. Rock outcrops (vegetated) is the second most common habitat type representing 28.8 percent of the land cover of the site, and is considered a sensitive natural community by CDFW (CDFW, 2013).

There is no MCV2 alliance associated with this community, although parts of the areas currently mapped as rock outcrops/vegetated would be assigned a vegetation category based on the dominant or co-dominant plant species. This requires a qualifier to depict the difference between the same vegetation types not on rock outcrops (i.e., *Adenostoma fasciculatum-Salvia mellifera* shrubland alliance on rock outcrops). The rock outcrops, both vegetated and unvegetated, provide a unique and important habitat type because of their potential to support sensitive plant and wildlife species.

Foothill Woodlands

Coast Live Oak Woodland (Upland)

Coast live oak woodland is dominated by coast live oak trees with a variable understory, depending on the surrounding habitat. Around the developed areas of the site, coast live oak woodlands generally occur with an understory of mostly introduced annual grasses and forbs such as ripgut brome (*Bromus diandrus*), wild oat (*Avena* spp.), and tocalote (*Centaurea melitensis*), and, occasionally, native perennial needlegrass (*Stipa* spp.). In the undeveloped areas, shrub species from adjacent chaparral or other vegetation types may also be present in the oak woodland understory. Small groups and individual oak trees are also included in this vegetation type. Coast live oak woodlands represent 7.7 percent of the land cover of SSFL. This community is considered by the CDFW and Ventura County as a locally important and sensitive natural community.

The MCV2 vegetation alliance associated with this community is **Quercus agrifolia* woodland alliance (coast live oak woodland).

Southern California Walnut Woodland

Southern California walnut woodland is defined by the presence of Southern California black walnut trees (*Juglans californica*), which is a California Rare Plant Rank List 4 species, due to its limited distribution and vulnerability to development. In some areas, coast live oak trees are co-dominant with the walnut trees and the understory is characterized by shrubs and subshrubs, including poison oak, snowberry (*Symphoricarpos mollis*), and purple sage. Southern California Walnut Woodland represents 0.5 percent of the total land cover of the site. This community is considered a sensitive natural community by CDFW.

The MCV2 vegetation alliance associated with this community is **Juglans californica* woodland alliance (California walnut groves).

Grasslands

Grassland

This vegetation category is applied to areas dominated by annual and perennial graminoid species. Many areas are characterized by non-native annual grasses such as bromes (*Bromus* spp.) and wild oat. Other areas are dominated or co-dominated by native perennial grasses, such as needlegrass. Vegetation cover is typically dense and soils are relatively deep. This type occurs in scattered locations throughout SSFL providing 3.7 percent of the land cover.

MCV2 vegetation alliances within the grassland community include the following: *Bromus-Brachypodium distachyon* semi-natural herbaceous stands (Annual brome grassland—on the site is dominated by *Bromus diandrus, Bromus hordeaceus*, and *B. madritensis with other introduced annual grasses*; *Brachypodium distachyon is infrequent or absent*), *Avena* semi-natural

* Considered a rare or high-priority vegetation type (CDFG, 2010).

herbaceous stands (wild oats grassland), **Nassella pulchra* herbaceous alliance (purple needlegrass grassland), and possibly others.

Steep Dipslope Grassland

Steep Dipslope Grassland occurs on steep north-facing slopes in the Northern Undeveloped Area and may occur in other areas of the site where suitable soil conditions exist. These sites have sandstone bedrock which follows the slope angle and is overlain by a thin (one to several inches) layer of soil. In some places vegetation is characterized by relatively stunted non-native annual grasses and herbs including wild oats, ripgut brome, and tocalote. In other areas the vegetation is characterized by a prevalence of native species including Bigelow's spike-moss (*Selaginella bigelovii*), shooting star (*Dodecatheon clevelandii*), wild onion (*Allium* sp.) common goldenstar (*Bloomeria crocea*), blue dicks (*Dichelostemma pulchellum*), lance-leaf dudleya (*Dudleya lanceolata*), chalk dudleya (*Dudleya pulverulenta*) and mariposa lily (*Calochortus* spp.). Native mosses, liverworts, and lichens may also be prevalent. This is considered a unique habitat type because of the assemblage of native plant species, including mariposa lily, which is a special-status species. Bigelow's spike moss, a rhizomatous perennial in combination with lichens and mosses help trap and anchor the soil as well as seeds, providing niches for plant establishment on the steep underlying rock faces. It occupies about 0.3 percent of the land cover of the site, and is considered as sensitive natural community by CDFW (CDFW, 2013).

The MCV2 vegetation alliance associated with this community is **Selaginella bigelovii* herbaceous alliance (bushy spikemoss mats).

Riparian

Coast Live Oak Riparian Woodland

Areas assigned the Coast Live Oak Riparian Woodland category typically occur along ephemeral streams on the site and support coast live oak trees associated with scattered riparian species such as willow (*Salix* spp.), cottonwood (*Populus* spp.), and mulefat (*Baccharis salicifolia*). Stands of oaks trees associated with ephemeral drainages that did not appear to support other riparian species were classified as coast live oak woodland. Coast Live Oak Riparian Woodland habitat occupies 1.1 percent of SSFL land cover and is more common along the larger drainages in the Southern Undeveloped Area. This community is considered by the CDFW and Ventura County as a locally important and sensitive natural community.

The MCV2 vegetation alliance associated with this community is **Quercus agrifolia* woodland alliance (coast live oak woodland).

Southern Willow Scrub

Southern Willow Scrub is found in scattered areas around Silvernale Pond, along ephemeral drainages, and other areas where water flow may be temporarily detained. On SSFL, Southern Willow Scrub is characterized by scattered to dense willows (*S. lasiolepis* and *S. laevigata*) and

* Considered a rare or high-priority vegetation type (CDFG, 2010).

mulefat, and may have occasional small individuals of western sycamore (*Platanus racemosa*), and coast live oak. California bay laurel (*Umbellularia californica*) has been occasionally noted in the most mesic habitats. Plants typical of the understory where soils are best developed include California wild rose (*Rosa californica*) and California blackberry (*Rubus ursinus*). Southern willow scrub provides 0.1 percent of the land cover of the site, and is considered as sensitive natural community by CDFW.

The MCV2 vegetation alliance associated with this community is **Salix lasiolepis* shrubland alliance (arroyo willow thickets), although in some areas of SSFL, the cover of arroyo willow may be less than what is defined for membership in this category due to very sparse cover of riparian trees resulting from suboptimal hydrologic conditions associated with scarce groundwater and very ephemeral stream flows. These conditions result in a very open community with scattered willows interspersed with patches of mulefat and coyote brush in the channel, and scattered oak trees on the banks.

Mulefat Scrub

Areas identified as mulefat scrub are dominated by mulefat. As with the coyote brush scrub on the site, this vegetation type is often observed in disturbed areas, particularly where additional surface or groundwater is available to support this normally riparian species. Mulefat is also found around Silvernale Pond and in association with coast live oak (riparian) or southern willow scrub, as well as around the R2 ponds near Outfall 18. With the recent drought, the cover of mulefat may be increasing in some areas where willows or other trees have declined, yet may be decreasing in other areas that are becoming drier. Mulefat Scrub occupies 0.4 percent of the land cover on SSFL.

The MCV2 vegetation alliance associated with this community is *Baccharis salicifolia* shrubland alliance (mulefat thickets).

Aquatic

Wetland

Due to the location of the site at the summit of the Santa Susana Mountains and the semiarid environment, water is scarce and the development of natural wetlands and associated aquatic vegetation or habitat is limited. Man-made features such as Silvernale Pond and the Building 4056 Excavation (a deep excavated pit) support emergent perennial wetland vegetation such as cattails (*Typha* spp.) and bulrush (*Schoenoplectus* sp.). The Sodium Reactor Experiment (SRE) pond has supported emergent perennial vegetation in the past, but currently is dominated by rabbitsfoot grass (*Polypogon monspeliensis*), a non-native annual species. Emergent wetland vegetation can also develop in man-made stormwater basins, such as the R2A pond and R2B pond adjacent to Outfall 18, and other areas of the site. Vernal pools, observed in previously disturbed (cleared, compacted soils) areas in Area IV, contain annual vernal pool plant species such as woolly marbles (*Psilocarphus* sp.) when suitable wet conditions occur. In total, about 1 acre (less than 0.1 percent) of wetland vegetation cover occurs on the SSFL property. Wetlands are considered by resource agencies to be sensitive habitats.

The MCV2 vegetation alliance associated with this community is *Schoenoplectus californicus* herbaceous alliance (California bulrush marsh); however, no equivalent community has been identified for the sparsely vegetated vernal pools that have been characterized on the site.

Open Water

Open Water is scarce at the site and includes the unvegetated areas of the man–made ponds. These ponds are capable of holding water for an extended periods of time. Silvernale Pond typically has open water year round, although the surface water can change depending on water availability (i.e., precipitation and run-off), as dry conditions occur periodically. The Building 4056 excavation, also a man-made feature, has nearly vertical walls that lead to permanent surface water about 50 feet below ground level. Stormwater detention basins, such as the R2 Ponds and other areas of the site, may also hold water for extended periods if conditions are right. Vernal rock pools are present in depressions in unvegetated rock outcrops in the Northern Undeveloped Area and likely occur in similar conditions elsewhere on the site. These small, shallow rock basins are typically only a few feet wide and were not mapped separately from the rock outcrop areas. They generally lack vascular plants. In total, about 1 acre (less than 0.1 percent) of Open Water land cover occurs on the site. Open Water habitats are considered by resource agencies to be sensitive habitats.

As open water habitats at SSFL are unvegetated, as defined above, there is no MCV2 vegetation alliance associated with this habitat type.

Other Land Cover

Rock Outcrops

Rock Outcrops land cover type includes areas of sandstone that appear nearly devoid of vegetation (although scattered plant species may be present, often rooted in crevices). These outcrops are typically higher, less fissured, or more steeply sloping, compared with the previously described rock outcrops/vegetated. The conditions restrict the ability of soil to deposit on the rock surface and plants to take root. Although limited on the site, this is an important land cover type as there is the potential for crevices, caves and natural depressions that seasonally hold water that provide habitat for wildlife, including bats, large mammals, nesting birds, and invertebrates such as fairy shrimp species. Scattered individuals of Santa Susana tarplant may be found in crevices in this land cover type, especially if adjacent to more vegetated outcrops that support this species. Rock outcrops occupy 0.8 percent of the SSFL land cover.

As rock outcrops are almost entirely unvegetated, as defined above, there is no MCV2 vegetation alliance associated with this habitat type.

Disturbed

Areas classified as disturbed cover type support a variety of native and non-native plants and include weed-dominated or ruderal areas, areas in the process of being revegetated but have not yet reached the level of maturity to be classified as the target vegetation type, and areas that are unvegetated as a result of recent disturbance or maintenance. About 2.4 percent of the land cover of SSFL is classified as disturbed.

Weed-dominated disturbed sites may include both non-native and native species that are easily able to disperse to and establish in open habitats. These areas often include invasive species (species rapidly expanding their range and dominance in the area) as well as naturalized species (species already widespread and dominant in disturbed habitats in the area). Extensive stands of invasive and naturalized non-native species such as Italian thistle (*Carduus pycnocephalus*), milk thistle (*Silybum marianum*), Russian thistle (*Salsola tragus*), Mediterranean mustard (*Hirschfeldia incana*), tamarisk (*Tamarix* sp.), tree tobacco (*Nicotiana glauca*), tree of heaven (*Ailanthus altissima*), and others have been noted in areas of the site.

Revegetated sites occur in various locations where buildings and other infrastructure have been removed and the soil has been seeded with a mix of native species. These areas are typically somewhat open shrub-dominated areas with annual grasses in the space between shrubs. Many of these sites support stands of mulefat or coyote brush that probably established without being seeded. Coast goldenbush (*Isocoma menziesii*), coastal bush sunflower (*Encelia californica*), coastal deerweed, and sometimes stands of native perennial needle grass may be present or prevalent on these sites.

Several MCV2 herbaceous alliances may be applied to weed-dominated disturbed sites based on dominant or co-dominant species. For sites undergoing active revegetation, the dominant species is likely to change until the site has reached a sustainable habitat condition. It is likely the final vegetation types would be reflective of what was planted, soil conditions, and adjacent vegetation types.

Developed

Developed land cover type is applied to areas with existing buildings, storage tanks, various infrastructure, and paved parking lots or roads. Unpaved roads or tracks (e.g., “two tracks”) are not included in this category, but mapped as part of the surrounding vegetation. About 5 percent of the land cover of SSFL is classified as developed. Since developed areas are unvegetated, there is no MCV2 vegetation alliance associated with this land cover type.

Undifferentiated Exotic Vegetation

Areas of Undifferentiated Exotic Vegetation include eucalyptus stands, planted windrows, or non-native ornamental species associated with buildings and occupy 0.2 percent of the land cover of the site.

The MCV2 includes *Eucalyptus* semi natural woodland stands (eucalyptus groves), but this type typically applies to large stands and groves that have become naturalized in the landscape and not individual or groups of trees planted for landscaping purposes. Eucalyptus stands and windrows large enough to map could be classified as this type.

4.3.1.2 Vascular Plants

Approximately 360 plant species have been observed throughout the project site. Almost a quarter of these are non-native species. Common shrub species include California sage brush, flat topped buckwheat (*Eriogonum deflexum*), laurel sumac, coyote brush, California encelia (*Encelia*

californica), chamise and ceanothus. Common riparian species include willows, mulefat, a variety of herbaceous species, such as mugwort (*Artemisia douglasiana*) and creek monkey flower (*Mimulus guttatus*), and monocots including various sedges (*Cyperus* spp.) and rushes (*Juncus* spp.). Non-native grassland and disturbed areas generally support a variety of non-native grasses and forbs, such as short-pod mustard (*Hirschfeldia incana*), Italian thistle, tree tobacco (*Nicotiana glauca*), tocalote, redstem filaree (*Erodium cicutarium*), yellow sweet clover (*Melilotus officinalis*), ripgut brome, red brome, slender wild oats, and smilo grass (*Stipa miliacea* var. *miliacea*).

4.3.1.3 Common Wildlife

Approximately 170 vertebrate species and a variety of invertebrate species have been observed throughout the project site during various biological surveys over the last decade (Padre, 2013; NASA, 2014a; Osokow, 2014). The site sage scrub, chaparral and grassland vegetation communities provide habitat to a number of common native wildlife species, such as western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis catenifer*), California quail (*Callipepla californica*), California thrasher (*Toxostoma redivivum*), wrentit (*Chamaea fasciata*), greater roadrunner (*Geococcyx californianus*), lesser goldfinch (*Carduelis psaltria*), Audubon's cottontail (*Sylvilagus audubonii*), black-tailed deer (*Odocoileus hemionus*), coyote (*Canis latrans*), woodrat (*Neotoma* sp.), and California ground squirrel (*Spermophilus beecheyi*). Although more limited, the project site also supports oak woodland and riparian vegetation, which provide habitat for species common to woodland or riparian areas such as western toad (*Bufo boreas*), acorn woodpecker (*Melanerpes formicivorus*), belted kingfisher (*Megaceryle alcyon*), red-winged blackbird (*Agelaius phoeniceus*), and common yellowthroat (*Geothlypis trichas*).

4.3.1.4 Wildlife Migration and Movement Corridors

Wildlife movement corridors are generally defined as connections between blocks of habitat that allow for physical movement and genetic exchange between otherwise isolated animal populations. Movement corridors may be local, such as between foraging and nesting or denning areas, or they may be regional in nature, allowing animals to access alternative territories as fluctuating dispersal pressures dictate.

Native habitats within or near the project site function, to some degree, as a wildlife movement corridor, connecting habitat areas throughout the Simi Hills, including animals that traverse through the Simi Hills to the Santa Susana Mountains to the north, and the Santa Monica Mountains to the south. These habitat areas may be especially critical where human activities would otherwise prohibit or impair the movement of species between habitat areas. Wildlife and their tracks have been frequently observed on unpaved access roads throughout the project site and at nearby Sage Ranch Park, suggesting that these areas play an important role in wildlife movement (Padre, 2013). As shown in **Figure 4.3-3**, the project site is located within the eastern strand of the Santa Monica-Sierra Madre Landscape Linkage, specifically, within Area I and the Southern Undeveloped Area. According to the South Coast Wildlands Missing Linkages Project (2008), the Santa Monica-Sierra Madre Landscape Linkage connects the Santa Monica

Mountains to the south and the Sierra Madre Ranges of the Los Padres National Forest to the north. Developed portions of the project site may provide some barriers to wildlife movement such as fencing or other infrastructure, and large, exposed asphalt areas absent of suitable vegetative cover may discourage movement compared to vegetated areas that provide foraging opportunities and shelter. Therefore, it is assumed that wildlife movement is focused mainly in undeveloped portions of the project site, including drainages.

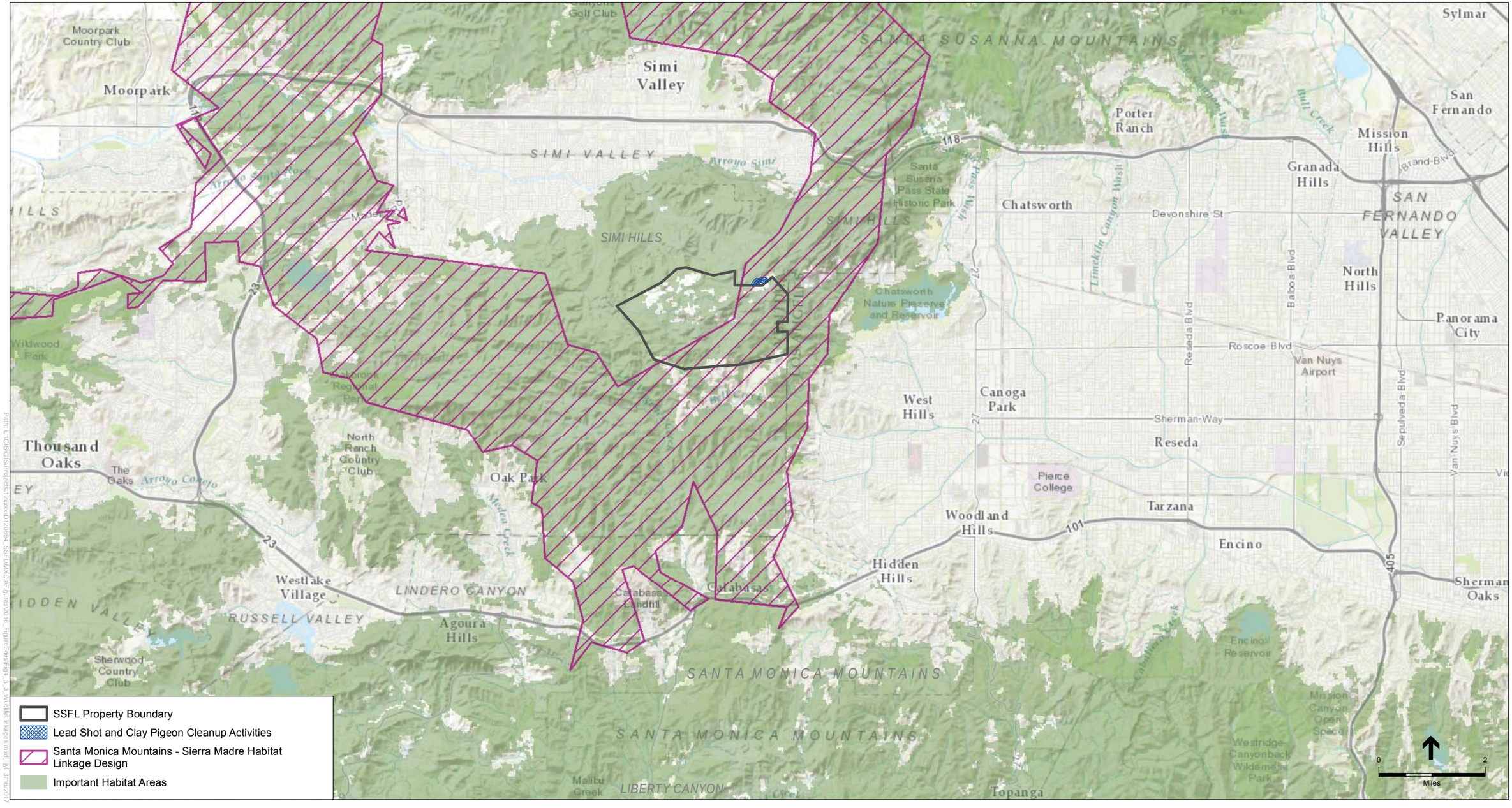
Resident and Migratory Waterfowl

The entire state of California, including the project site, is located within the Pacific Flyway, a major north-south flyway for migratory birds in America, extending from Alaska to Patagonia. Every year, at least one billion birds migrate along the Pacific Flyway in both spring and fall, following food sources, heading to breeding grounds, or travelling to overwintering sites. Habitat loss, water shortages, diminishing food sources, and climate change all threaten the birds of the Pacific Flyway, which include tricolored blackbird (*Agelaius tricolor*), Swainson's hawk (*Buteo swainsoni*), and numerous other avian species (Audubon, 2015).

A waterfowl study conducted by Padre Associates (2015) within Areas I and III included a waterfowl habitat assessment of the R-1 Pond, Perimeter Pond, and Silvernale Pond from May 2014 through July 2014, and October 2014 and November 2014. Based on the survey results, it was determined that all three ponds have low relative densities of waterfowl. No waterfowl were observed within the R-1 and Perimeter Ponds during the 2014 sampling period, although the lack of observations is likely due to low water levels in these ponds at the time of the surveys. Silvernale Pond is the only pond where waterfowl (and other birds) were observed, including mallard (*Anas platyrhynchos*), red-winged blackbird (*Agelaius phoeniceus*), killdeer (*Charadrius vociferous*), snowy egret (*Egretta thula*), American coot (*Fulica Americana*), and lesser yellowlegs (*Tringa flavipes*).

Ponds within Area II, including R-2A, R-2B, and Coca Skim Ponds, also provide foraging, nesting, and resting habitat for mallards and herons, including the green heron (*Butorides virescens*) and the great blue heron (*Ardea herodias*). These habitats serve as foraging and breeding habitat for various frogs, salamanders, and aquatic reptiles, and also provide prey opportunities for hawks, owls, coyotes, raccoons, and foxes (NASA, 2013).

Avian surveys conducted by the San Fernando Valley Audubon Society (SFVAS) between May 2011 and September 2014, indicate that other waterbirds have been observed within suitable habitat at the project site, including, American white pelican (*Pelecanus erythrorhynchos*), great egret (*Ardea alba*), spotted sandpiper (*Actitis macularius*), black-crowned night heron (*Nycticorax nycticorax*), western gull (*Larus occidentalis*), osprey (*Pandion haliaetus*), double-crested cormorant (*Phalacrocorax auritus*), greater yellowlegs (*Tringa melanoleuca*), and eared grebe (*Podiceps nigricollis*). Although numerous species of waterbirds were observed by the SFVAS between May 2011 and September 2014, mallard are the only waterfowl species that has been observed at the project site.



SOURCE: ESRI; Penrod et al. 2006

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Figure 4.3-3

Wildlife Migration Linkage

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If surface water is present in R-1 Pond, Perimeter Pond, R-2A Pond, R-2B Pond and Coca Skim Pond during springtime breeding and winter migration, these ponds would potentially support both resident and migratory waterfowl. Silvernale Pond was the only pond during the 2014 sampling period that provided suitable resident and migratory waterfowl resting, feeding, and nesting habitat, because it has water year-round, and continues to support both resident nesting and migratory waterfowl today.

4.3.1.5 Sensitive Biological Resources

In accordance with CEQA, sensitive biological resources are generally defined as: (1) vegetation communities, habitats and/or other features that are unique, of relatively limited distribution, or of particular value to wildlife; (2) riparian resources; and (3) special-status species that have been given specific recognition by federal or state agencies, or are included in regional conservation plans due to limited, declining, or threatened populations.

Through its CNDDB program, CDFW maintains a computerized inventory of information on the location and condition of all animal taxa and California's vegetation alliances, regardless of their legal or protection status. CNDDB element ranks range from 1 through 5 (Global and State) according to their degree of imperilment (as measured by rarity, trends, and threats).

Sensitive Habitats

Sensitive habitats include sensitive natural communities that are designated as such by the CDFW, as well as habitats afforded protection by federal, state and/or local policies and regulations. Sensitive habitats are generally considered to have important functions or values for wildlife and/or are recognized as declining in extent or distribution, and are considered threatened enough to warrant some level of protection. For example, in accordance with Senate Bill 1334, the state of California protects oak woodlands; and federal, state, and/or regional agencies consider wetlands and riparian habitats as sensitive resources. CDFW identifies communities it believes to be of conservation concern through its List of California Terrestrial Communities (CDFG, 2010) and tracks the localities by the CNDDB. Vegetation communities classified under the Holland (1986) system that may encompass, either in whole or part, rare alliances or associations are maintained and ranked as part of CNDDB's list of vegetation alliances. For purposes of this PEIR, sensitive vegetation communities include the following, excluding disturbed communities:

- Vegetation communities identified in the List of California Terrestrial Communities with a CNDDB state rank of S1, S2, or S3
- Vegetation communities identified by CDFW to be locally or regionally sensitive (CDFW, 2013)
- Wetlands and open water
- Locally important vegetation communities as defined by Ventura County

A locally important vegetation community is defined by Ventura County as one that is considered to be a quality example, characteristic of or unique to the county or region. This determination is made on a case-by-case basis by a qualified biologist. The County has not developed a list of

locally important communities, but has deemed oak woodlands to be a locally important community through the county's Oak Woodland Management Plan (2007). **Table 4.3-2** identifies the acreages associated with each sensitive community.

TABLE 4.3-2
SENSITIVE HABITATS

Vegetation Community or Land Cover Type	Rarity Ranking[1]	Acreage
Shrublands		
Chaparral	Unranked	967.1
Venturan Coastal Sage Scrub	G3S3.1/LI	128.9
Foothill Woodlands		
Coast Live Oak Woodland (Upland)	G4S4/LI	223.5
Southern California Walnut Woodland	G2S2.1	13.3
Grasslands		
Steep Dip Slope Grassland	Unranked	7.8
Riparian		
Coast Live Oak Riparian Woodland	G4S4/LI	30.9
Southern Willow Scrub	G3S2.1	3.6
Aquatic		
Open Water	Unranked	1.2
Wetland	Unranked	1.2
Other Land Cover Types		
Rockoutcrop/Vegetated	Unranked	821.7
Total		**2,199.2**

[1] Species and vegetation alliances with state ranks of S1, S2, or S3 are considered to be critically imperiled, imperiled, or vulnerable to extinction or extirpation, respectively; and thus considered by CDFW to be rare or sensitive. A question mark (?) after the rank denotes an inexact numeric rank due to insufficient samples over the full expected range of the type, but existing information points to this rank.

[2] **CNDDB Element Ranking**
Global Ranking
G1 = Less than 6 viable element occurrences (EOs) OR less than 1,000 individuals OR less than 2,000 acres.
G2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres.
G3 = 21-80 EOs OR 3,000-10,000 individuals OR 10,000-50,000 acres.
G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.
State Ranking
S1 = Less than 6 EOs OR less than 1,000 individuals OR less than 2,000 acres
S2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres
S3 = 21-80 EOs or 3,000-10,000 individuals OR 10,000-50,000 acres
S4 = Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat.
S5 = Demonstrably secure to ineradicable in California.
State Threat
.1 = very threatened
.2 = threatened
.3 = no current threats known

Local Ranking
LI = Locally Important as defined by Ventura County
SOURCE: Leidos, 2016; ESA, 2016.

As shown, the project site contains approximately 2,199 acres of sensitive habitats, the majority of which is comprised of chaparral and vegetated rock outcrop. While the chaparral community is not considered a sensitive habitat according to the definitions identified above, there are sensitive vegetation alliances within the chaparral community that are known to occur on the project site including holly-leaf chaparral and thick leaf yerba santa scrub. However, since alliance-based vegetation mapping has not been conducted site-wide, this analysis assumes that all chaparral habitat that occurs onsite is considered sensitive.

Special-Status Species

Special-status species include the following:

- Species listed, proposed, or candidate species for listing as Threatened or Endangered by the USFWS or the National Marine Fisheries Service (NMFS) pursuant to the Federal Endangered Species Act of 1969 (FESA), as amended
- Species listed as Rare, Threatened, or Endangered by the California Fish and Game Commission pursuant to the California Endangered Species Act of 1970 (CESA), as amended, or the California Native Plant Protection Act (Fish and Game code 1900 et seq.)
- Species designated by the Legislature as Fully Protected under Sections 3511 (birds), 4700 (mammals), and 5050 (reptiles and amphibians) of the California Fish and Game Code
- Species protected by the California Fish and Game Code Sections 1801-1802, 2000-2021.5
- Species designated by the CDFW as California Species of Special Concern
- Plant species with a CNPS California Rare Plant Rank (CRPR) of 1A, 1B, 2A, 2B, or 3[2] (however, List 4 are also considered in this Biological Resource Section))
- Species not currently protected by statute or regulation, but considered rare, threatened, or endangered under the CEQA Guidelines (Section 15380). This includes species and vegetation communities with a CNDDB state rank of S1, S2, or S3
- Locally important species listed in the Ventura County General Plan, which are also listed in the Ventura County Planning Division's 2014 Locally Important Plant List and Animal List
- Trees afforded protection by the Ventura County Tree Protection Ordinance

Special-status plant and wildlife species with the potential to occur or that have been documented within the project site were compiled in Table 4.3-5 and Table 4.3-6, respectively, based on the CNDDB and CNPS queries using a 9-quadrangle search. Species from the Ventura County Planning Division 2014 Locally Important Animal List were included as well, in addition to species identified during surveys at the project site (Padre, 2013) as potentially occurring in the area. Special-status wildlife species that have been observed or detected within one SSFL

[2] All of the plants constituting California Rare Plant Rank 1A, 1B, 2A, 2B, and 3 may meet the definitions of the CESA of the California Department of Fish and Game Code, and are eligible for state listing. Impacts to these species or their habitat must be analyzed during preparation of environmental documents relating to CEQA, or those considered to be functionally equivalent to CEQA, as they meet the definition of Rare, Threatened or Endangered under CEQA Guidelines Section 15125(c) and/or Section 15380.

administrative area are assumed to be present in other administrative areas within suitable habitat for the particular species, unless recent protocol surveys for the species indicate negative findings in those administrative areas (in which case the potential for the species to occur would be low).

A total of 132 special-status plant and wildlife species were evaluated for their potential to occur in the project site based on overall species distribution and the type and quantity of habitats present on and adjacent to the project site. In addition, a number of biological resources reports prepared for the project site were reviewed to identify potentially occurring species and to evaluate potential impacts, and are listed below.

- Botanical Survey Report for the Boeing Company Santa Susana Field Laboratory Soils and Groundwater Remediation Project (Padre, 2014c).
- 90-day Report on Mid-Wet Season Fairy Shrimp Identification Survey for the Boeing Santa Susana Field Laboratory, Simi Hills, Ventura County, CA (Padre, 2010).
- Vernal Pool Branchiopod Habitat Assessment for the Santa Susana Field Laboratory, Ventura County, California. Prepared for the Boeing Company (Padre, 2014d; 2015b).
- 2010 Habitat and Listed Species Surveys of NASA-Administered Property at Santa Susana Field Laboratory (NASA, 2011a).
- 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory (NASA, 2011b).
- Habitat Assessment for the Endangered Quino Checkerspot Butterfly at the NASA-administered Areas I and II of the Santa Susana Field Laboratory (Arnold, 2012).
- Santa Susana Field Laboratory Soils and Groundwater Remediation Project Western Spadefoot Toad Habitat Assessment and Species Conservation Recommendations (Padre, 2014b).
- Fall Biological Survey Report for Santa Susana Field Laboratory Area IV and Northern Undeveloped Areas (SAIC, 2009a).
- California red-legged frog habitat site assessment at Santa Susana Field Laboratory Area IV and Vicinity (SAIC, 2010).
- [2010, 2011, and 2012] California gnatcatcher habitat assessment and protocol survey of potential habitat within Santa Susana Field Laboratory Area IV and Northern Buffer Zone (Griffith, 2010–2012).
- Least Bell's Vireo Protocol Survey of the EPA Radiological Study Area at the Santa Susana Field Laboratory 2012 (Werner, 2012).
- Santa Susana Field Laboratory Soils and Groundwater Remediation Project Golden Eagle (*Aquila chrysaetos canadensis*) Nest Survey, Habitat Assessment, and Species Conservation Recommendations (Padre, 2014a).
- Acoustical Bat Survey, Santa Susana Field Laboratory, Ventura County, California, Soil and Ground Remediation Sites and Southern Undeveloped Land Borrow Sites (Forde, 2014).

The degree to which a species has the potential to occur onsite was evaluated based on the following criteria:

- **None:** The project site and/or immediate vicinity provides no suitable habitat to support the species.
- **Low Potential:** The project site and/or immediate vicinity provides very limited or low quality habitat for a particular species, such as improper substrates, disturbed or otherwise degraded habitat, improper assemblage of desired vegetation, and/or the site is outside of the known elevation range of the species.
- **Moderate Potential:** The project site and/or immediate vicinity provides suitable, but not ideal habitat for a particular species. For example, proper substrates may be present, but the desired vegetation assemblage or density is less than ideal; or substrates and vegetation are suitable, but the site is outside of the known elevation range of the species.
- **High Potential:** The project site and/or immediate vicinity provide high-quality or ideal habitat (i.e., soils, vegetation assemblage, and topography) for a particular species and/or there are known occurrences in the general vicinity of the project site.
- **Present:** The species or vegetation community/habitat has been observed within the project site and/or immediate vicinity during surveys.

Of the 132 species evaluated, 45 have been observed within the project site, and 45 species were determined to have a moderate to high potential to occur within the project site. The remaining 42 species have a low potential to occur or are not expected to occur, so they are not described in further detail. Nevertheless, impacts to such species are addressed in Section 4.3.4, *Impacts to Biological Resources*. The conservation status and habitat association of all special-status species evaluated are summarized in **Table 4.3-3** and **Table 4.3-4** for special-status plant and wildlife species, respectively. The locations of special-status species observed during biological surveys of the project site are depicted in **Figure 4.3-4** and **Figure 4.3-5**.

Special-Status Plants

Based on focused surveys conducted between 2005 and 2013, Santa Susana tarplant was the most prevalent special-status species observed within Area I and Area III. The vast majority of this plant occurs in association with the sandstone outcrops. As shown in Figure 4.3-4, other observed special-status plant species include *Calochortus* species such as Catalina mariposa lily (*Calochortus catalinae*), slender mariposa lily (*Calochortus clavatus* var. *gracilis*), and Plummer's mariposa lily (*Calochortus plummerae*), as well as ocellated Humboldt lily (*Lilium humboldtii* ssp. *ocellatum*), and Southern California black walnut. In addition, coast live oak has been documented within Area I, Area II, Area III and Area IV; and western sycamore (*Platanus racemosa*) has been documented in Area IV. Both coast live oak and western sycamore are considered Ventura County Locally Important Plant Species and/or protected in accordance with the Ventura County Tree Protection Ordinance.

No federally or state-listed plant species were detected during the 2010 or 2011 rare plant surveys; however, Santa Susana tarplant was observed in numerous locations within Area I and Area II. Several slender mariposa lilies and two individuals of Plummer's mariposa lily were observed in Area II (NASA, 2014a).

Focused rare plant surveys conducted within Area IV in the fall of 2009 confirmed that Braunton's milk-vetch (*Astragalus brauntonii*), Santa Susana tarplant, and Southern California black walnut were present (SAIC, 2009a). Braunton's milk-vetch was fairly dense and concentrated within northern mixed chaparral in the vicinity of the USFWS-designated critical habitat for Braunton's milk-vetch in the southwestern portion of Area IV. Santa Susana tarplant was observed throughout Area IV and in the Northern Undeveloped Area in association with sandstone outcrops, and black walnut trees were confirmed on several localized areas in the western portion of the site, generally at the base of hillsides with northerly or easterly exposures. Other special-status plant species documented within DOE areas include Catalina mariposa lily, slender mariposa lily, Plummer's mariposa lily, Malibu baccharis, and coast live oak (CNDDB, 2015a; HydroGeoLogic, 2011; Leidos, 2014b; DOE, 2014).

In summary, a total of 59 special-status plant species have been documented in the region, (9-quad query), of which 11 have been observed within the project site. Of the 59 species documented in the region, 27 have a moderate to high potential to occur within the project site, and the remaining 21 plant species have a low potential based on a lack of suitable habitat within the project site.

Special-Status Plant Species Descriptions

Braunton's milk-vetch

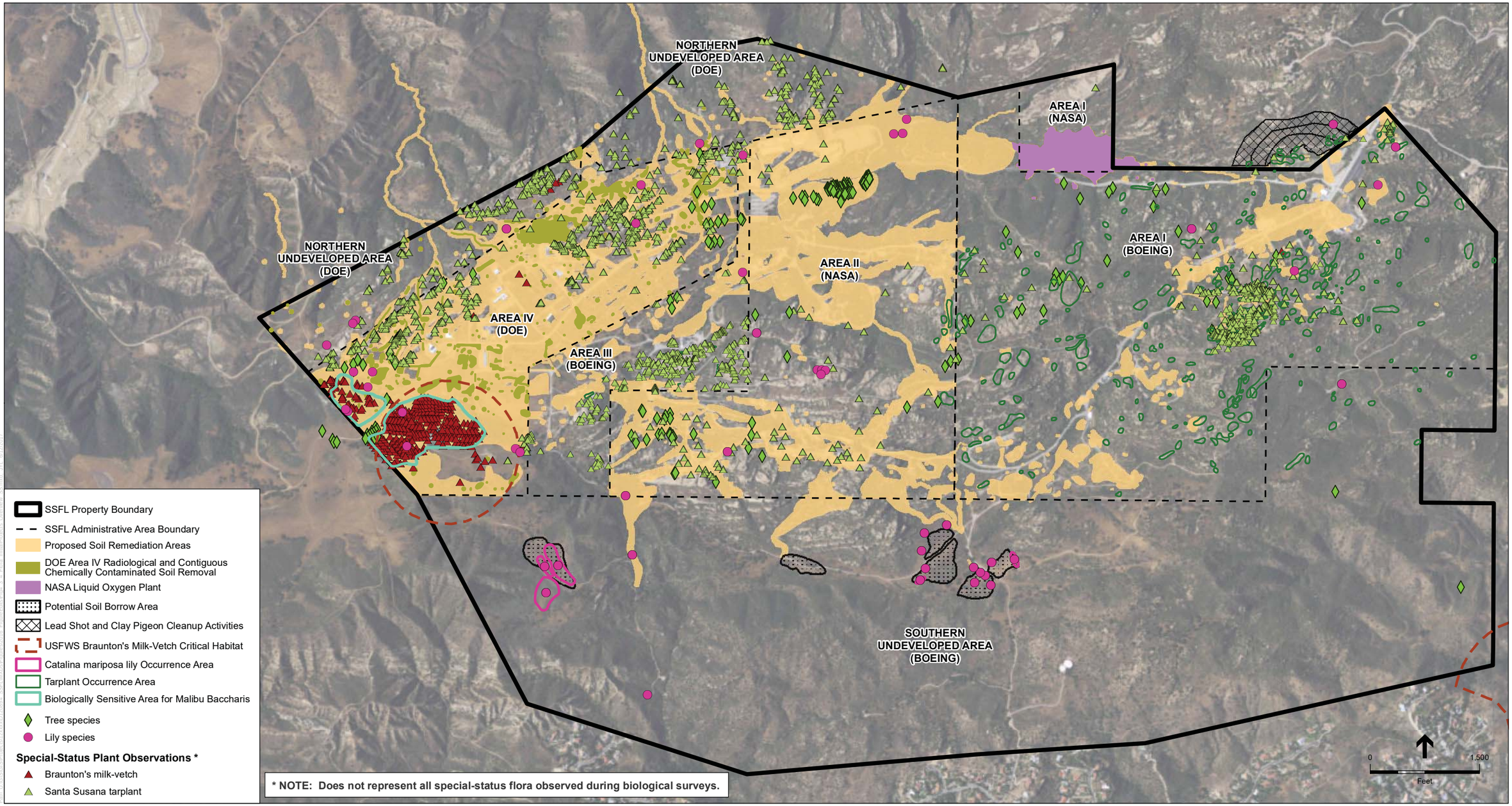
Braunton's milk-vetch is a perennial herb limited to limestone outcrops in chaparral, coastal sage scrub, closed-cone forest, and grassland communities. It is endemic to southern California and ranges from the State's central south coast to the north Peninsular Ranges of the Los Angeles Basin in Ventura, Los Angeles, and Orange counties from 15 to 610 meters (approximately 50 to 2,000 feet) in elevation. Braunton's milk-vetch is listed as federally endangered and ranked by the CNPS as CRPR 1B.1 (Rare-Seriously Threatened). The majority of this species has been observed in Area IV, within designated critical habitat for the species. An individual plant has also been documented within Area I.

Malibu baccharis

Malibu baccharis is a perennial deciduous shrub that occurs in chaparral, cismontane woodland, coastal scrub and riparian woodland habitats. It is endemic to southern California in the Western Transverse Ranges and Peninsular Ranges from 50–300 meters (approximately 164 to 900 feet) in elevation. Malibu baccharis is ranked by the CNPS as CRPR 1B.1 (Rare-Seriously Threatened). There were several reported occurrences within Area IV.

Catalina mariposa lily

Catalina mariposa lily is a perennial bulbiferous herb that occurs in heavy soils in chaparral, cismontane woodland, coastal scrub and valley and foothill grassland below 700 meters (approximately 2,300 feet). When occurring on slopes, it is usually associated with coastal scrub vegetation. It is endemic to California in the Central Coast, Outer South Coast Ranges, South Coast especially the Channel Islands, Western Transverse Ranges, San Gabriel Mountains and Peninsular Ranges. Catalina mariposa lily is ranked by the CNPS as CRPR 4.2 (Plants of Limited Distribution-Fairly Threatened). This species was observed in 2014 within Area I, Area III, and the Southern Undeveloped Area.

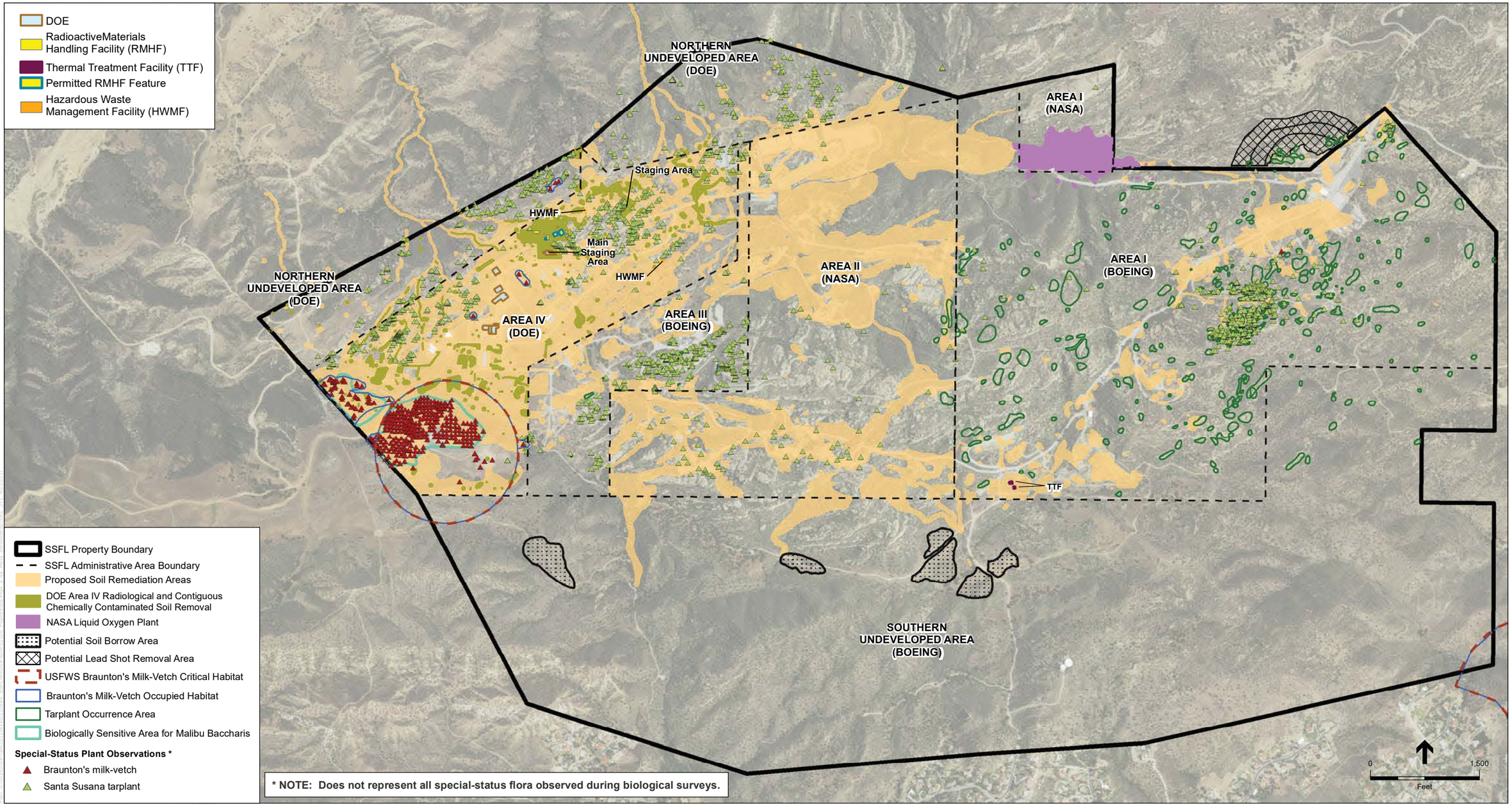


SOURCE:Boeing 2016; NASA 2016; DOE 2015

Santa Susana Field Laboratory.120894

Figure 4.3-4

Plant Observations and Designated Critical Habitat Overview



SOURCE:Boeing 2016; NASA 2016; DOE 2015

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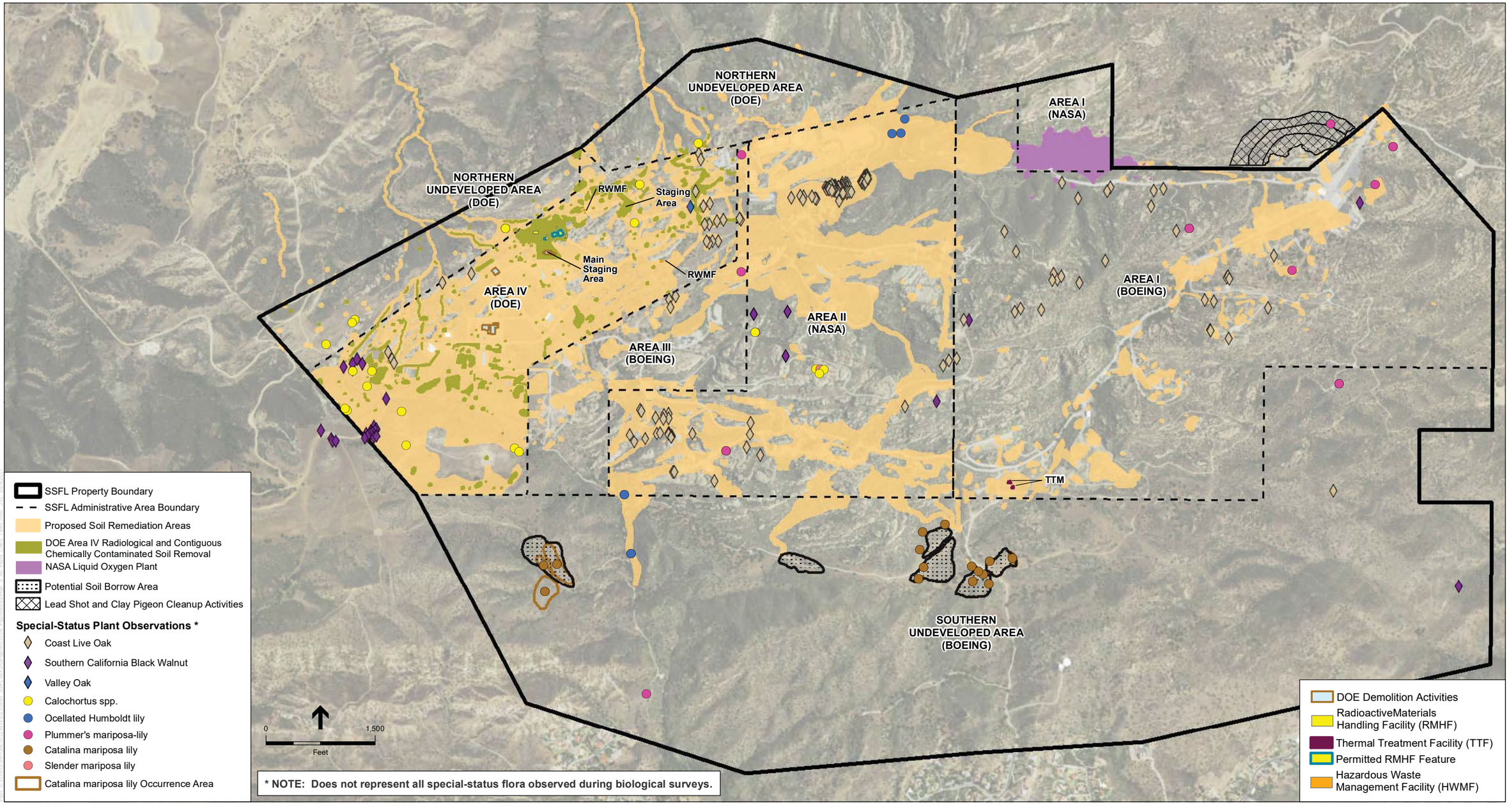
Figure 4.3-4a

Special-Status Plant Observations and Designated Critical Habitat

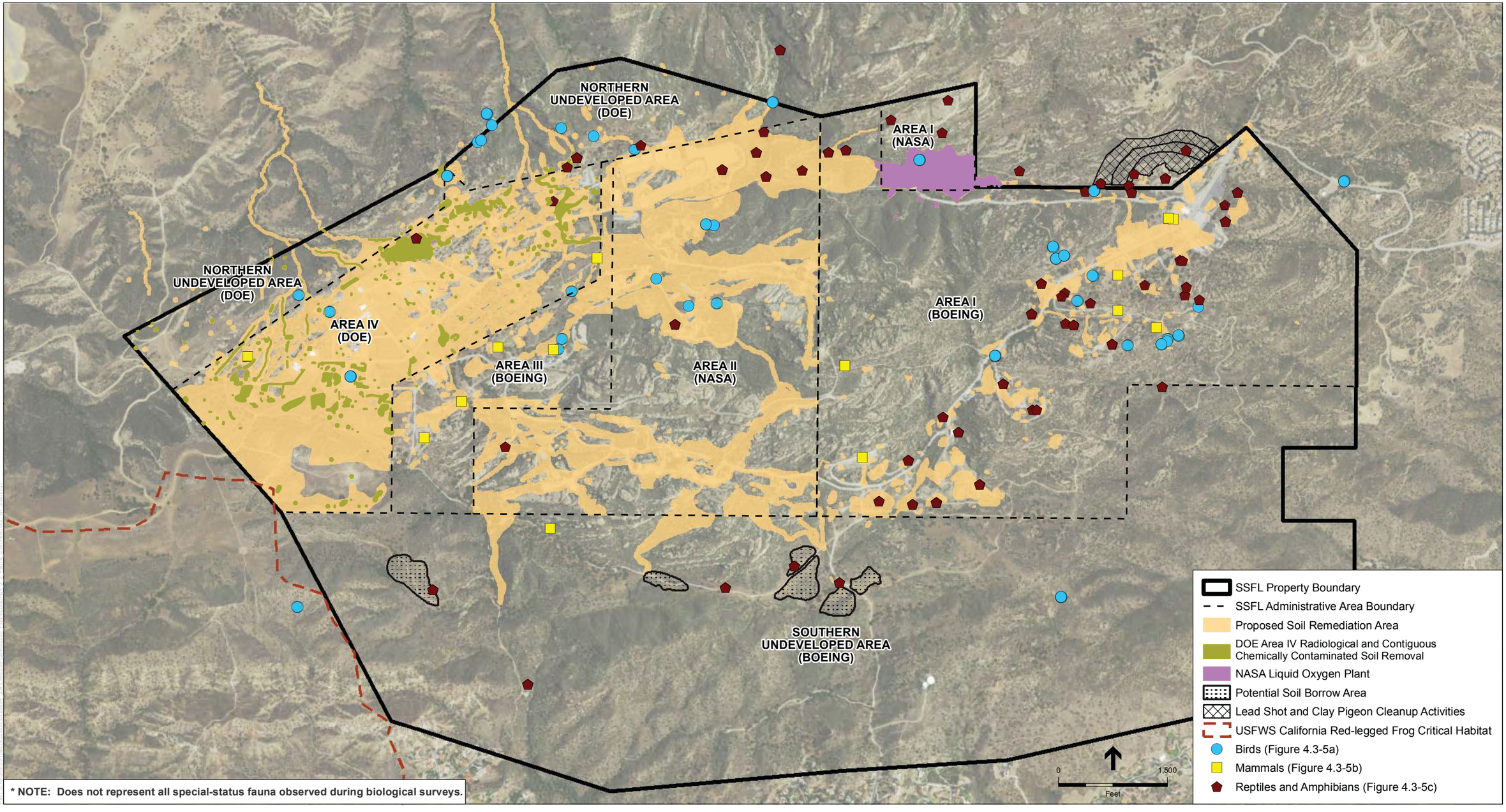


SOURCE:Boeing 2016; NASA 2016; DOE 2015

Santa Susana Field Laboratory.120894

Figure 4.3-4b

Special-Status Plant Observations and Designated Critical Habitat - Trees and Lilies



SOURCE:Boeing 2016; NASA 2016; DOE 2012; Padre 2014, 2015; USFWS 2016; MWH 2016

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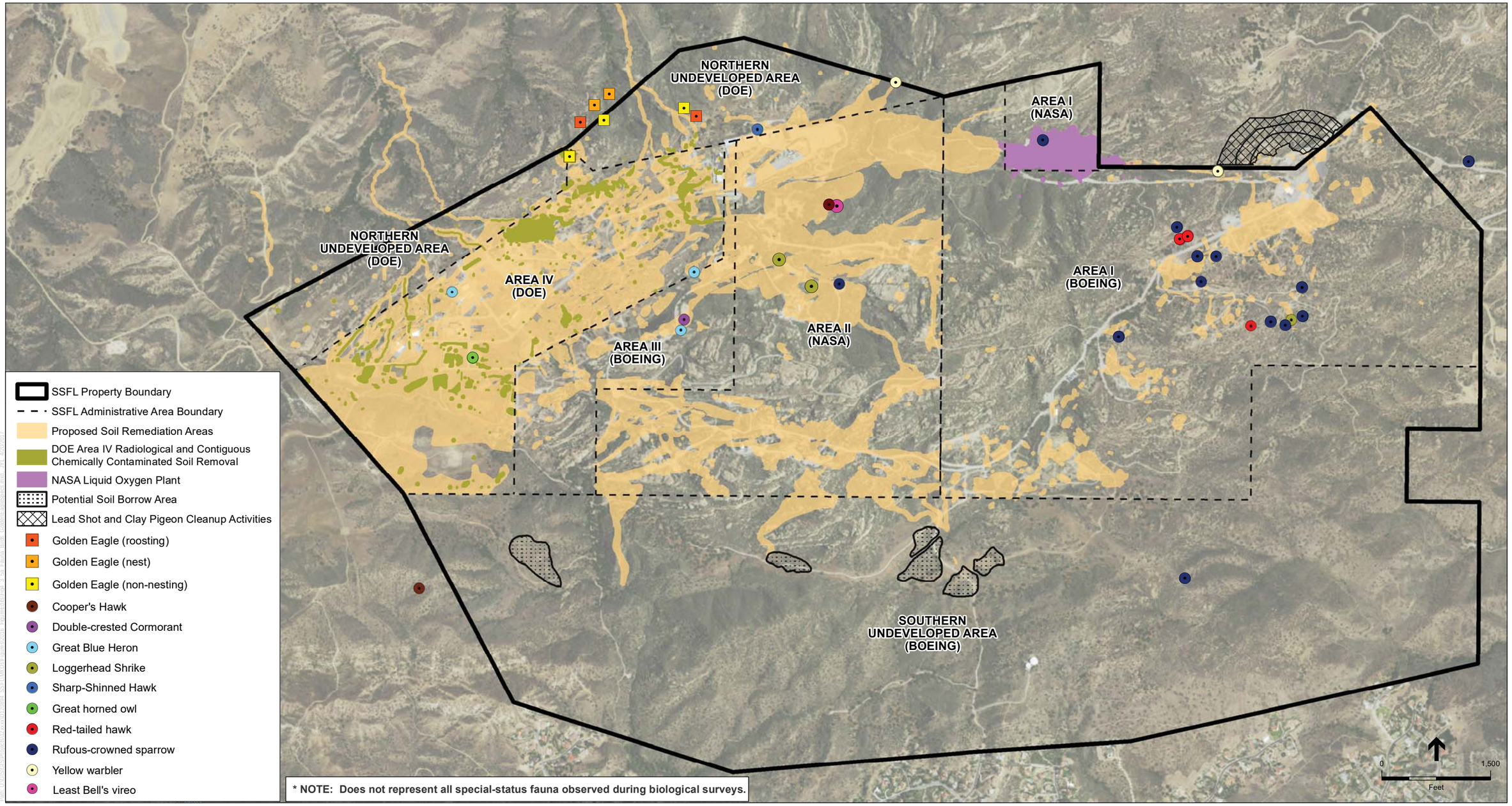
Figure 4.3-5

Overview of Special-Status Wildlife Observations and Designated Critical Habitat



SOURCE:Boeing 2016; NASA 2016; DOE 2016; Padre 2014, 2015

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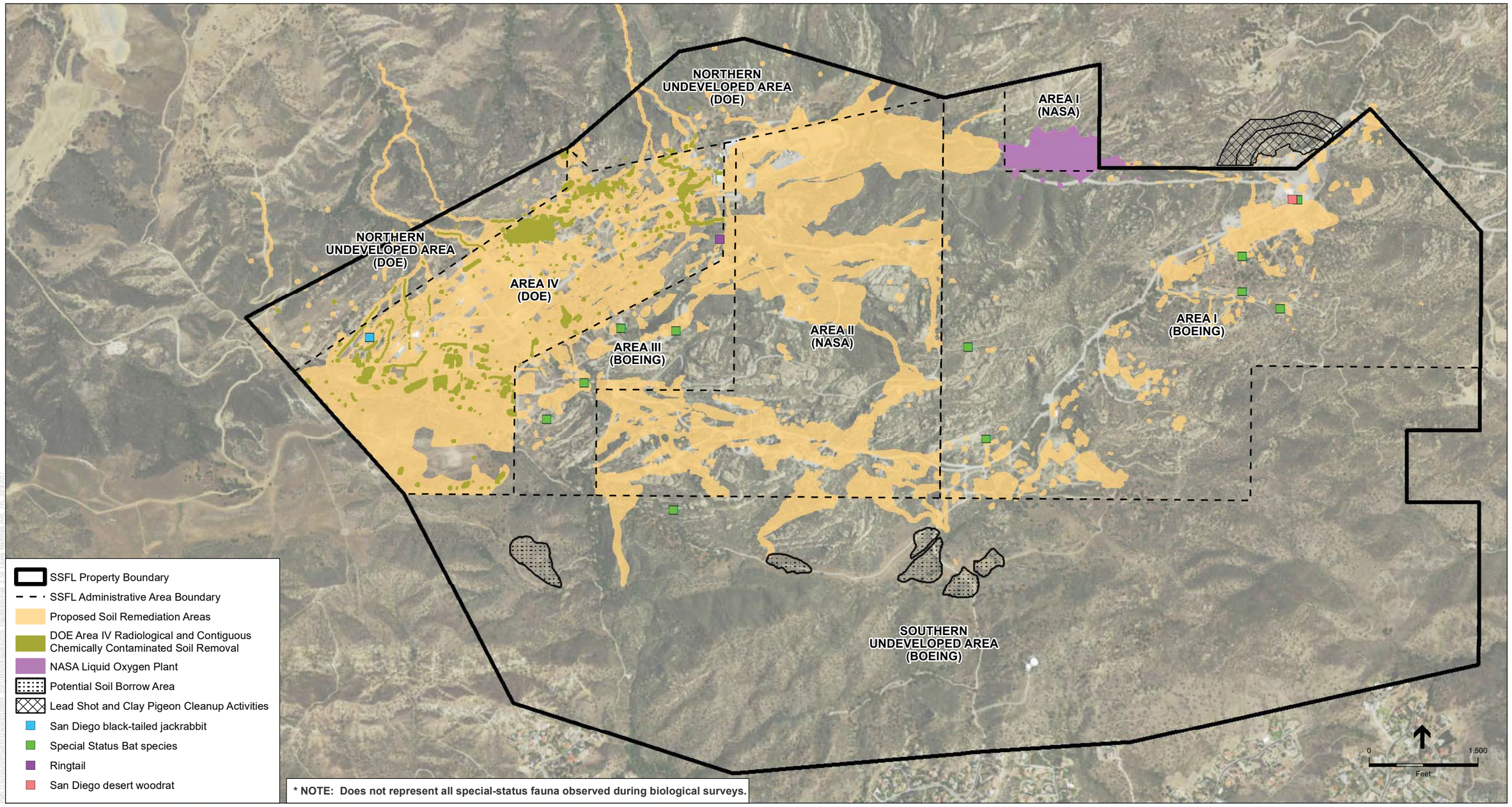
Figure 4.3-5a

Special-Status Wildlife Observations and Designated Critical Habitat - Birds

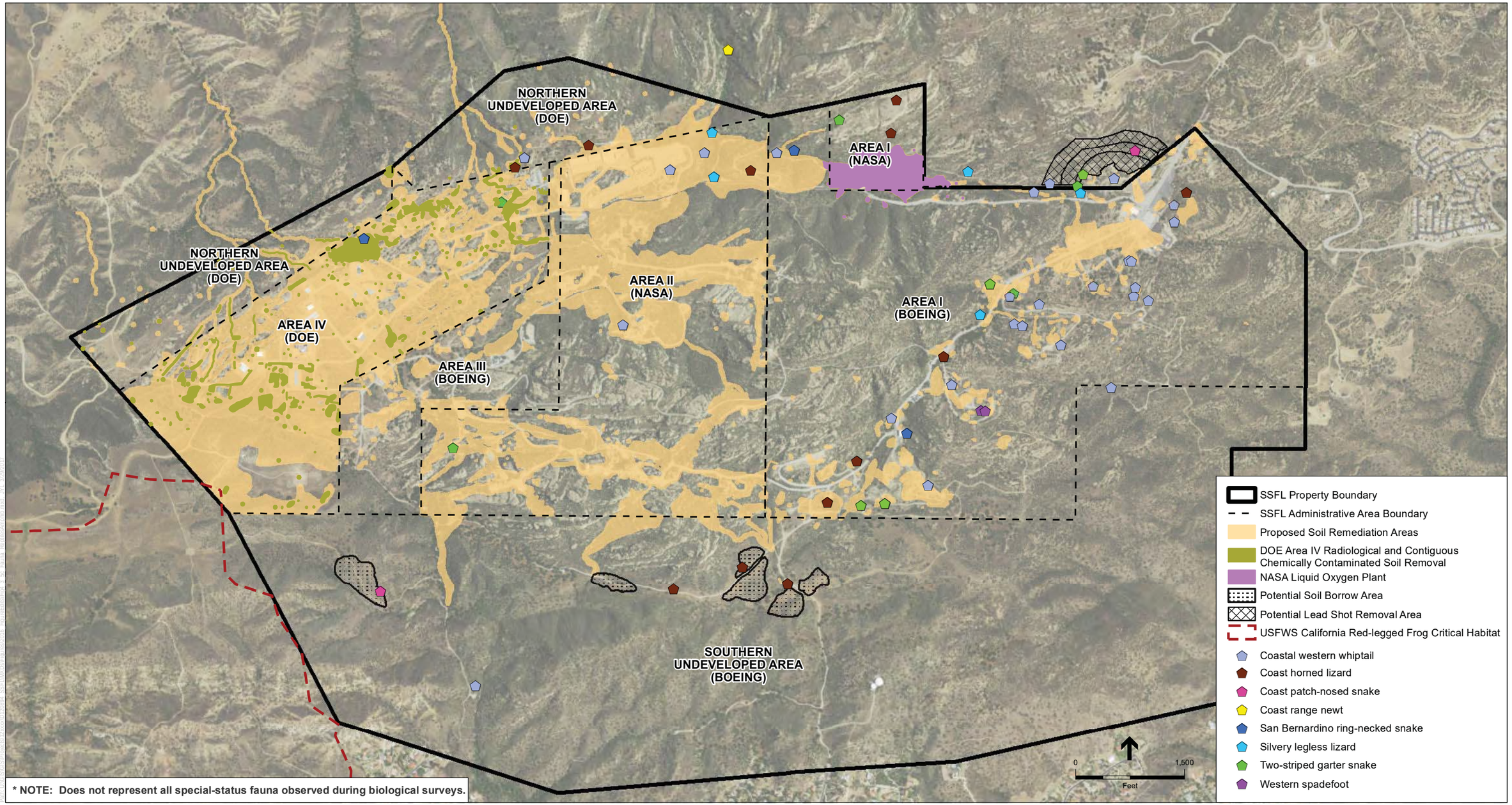


SOURCE:Boeing 2016; NASA 2014; DOE 2014

Santa Susana Field Laboratory.120894

Figure 4.3-5b

Special-Status Wildlife Observations and Designated Critical Habitat - Mammals



SOURCE: Boeing 2016; NASA 2016; DOE 2014; USFWS 2016

Santa Susana Field Laboratory.120894

Figure 4.3-5c

Special-Status Wildlife Observations and Designated Critical Habitat - Reptiles and Amphibians

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TABLE 4.3-3
SPECIAL-STATUS PLANT SPECIES DOCUMENTED IN THE PROJECT REGION

Species	Status	Habitat	Potential for Occurrence
Western spleenwort *Asplenium vespertinum*	CRPR 4.2	Chaparral, cismontane woodland, coastal scrub; moist, rocky soils. 180 to 1,000 m elevation.	**Moderate.** Suitable habitat is prevalent onsite; however, moist substrates are limited. This perennial species, which is easy to observe, has not been observed during numerous biological surveys.
Braunton's milk-vetch *Astragalus brauntonii*	FE, CRPR 1B.1	Chaparral, coastal scrub, grassland and closed-cone conifer forest. 4 to 640 m elevation. The species was once thought to be restricted to carbonate and calcareous soils, though has also been found on gravelly clay soils overlaying granite sandstone.	**Present.** The vast majority of plants occur in the western portion Area IV, within designated critical habitat. This species was not observed within Areas I, II, III or Southern Undeveloped Area during rare plant surveys (Padre, 2014c; NASA, 2011b).
Ventura Marsh milk-vetch *Astragalus pycnostachyus* var. *lanosissimus*	FE, SE, CRPR 1B.1 , LC	Coastal dunes, coastal scrub, marsh edges. 1 to 35 m elevation.	**None.** Habitat not present onsite; outside elevation range for the species.
Coastal dunes milk-vetch *Astragalus tener* var. *titi*	FE, SE, CRPR 1B.1	Coastal bluff scrub, coastal dunes; sandy soils; often found in vernally mesic areas. 1 to 50 m elevation.	**None.** Habitat not present onsite; outside elevation range for the species.
Coulter's saltbush *Atriplex coulteri*	CRPR 1B.2, LC	Coastal bluff scrub, coastal dunes, coastal scrub, grassland; alkaline or clay soils. 3 to 460 m elevation.	**None.** Habitat not present onsite.
Parish's brittlescale *Atriplex parishii*	CRPR 1B.1	Alkali meadows, vernal pools, chenopod scrub and playas with fine soils. 4 to 140 m elevation.	**None.** Little to no suitable habitat onsite; potential vernal pools onsite are located on sandstone outcrops, and do not provide suitable soil for this species. Outside elevation range.
Davidson's saltscale *Atriplex serenana* var. *davidsonii*	CRPR 1B.2	Coastal bluff scrub, coastal scrub. 10 to 200 m elevation.	**None.** Habitat not present onsite; outside elevation range. This perennial woody species, which is easy to observe, has not been observed during numerous biological surveys.
Malibu baccharis *Baccharis malibuensis*	CRPR 1B.1	Chaparral, coastal scrub, and oak woodlands. 150 to 305 m elevation.	**Present.** Several reported occurrences within Area IV (Padre, 2013).
Brewer's calandrinia *Calandrinia breweri*	CRPR 4.2	Chaparral and coastal scrub; sandy or loamy soils; often found in disturbed or burned areas. 10 to 1,220 m elevation.	**Moderate.** Suitable habitat is prevalent onsite; however, disturbed and burned areas are primarily in Area IV. Not observed during various biological surveys.

Species	Status	Habitat	Potential for Occurrence
Round-leaved filaree *California* (=*Erodium) macrophylla*	CRPR 1B.1, LC	Valley and foothill grassland, and cismontane woodland; clay soils. 15 to–1,200 m elevation.	**Moderate.** This species has a moderate potential to occur within grassland habitat containing suitable clay soils in a small area in the southwestern portion of the proposed remediation areas.
Catalina mariposa lily *Calochortus catalinae*	CRPR 4.2	Openings within chaparral, coastal scrub, grassy slopes, and cismontane woodland. 15 to 700 m elevation.	**Present.** Approximately 3,000 individuals were observed in the spring of 2014 within the Southern Undeveloped Area and additional populations may exist. Also documented from Area IV.
Club-haired mariposa lily *Calochortus clavatus* var. *clavatus*	CRPR 4.3	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland; usually serpentinite, clay, or rocky soil. 57 to 1,300 m elevation.	**High.** High-quality habitat is prevalent onsite; however, not observed during various botanical surveys.
Slender mariposa lily *Calochortus clavatus* var. *gracilis*	CRPR 1B.2, LC	Chaparral, coastal scrub, grassland. 360 to 1,000 m elevation.	**Present.** This species has not been observed within Boeing Areas, but has been documented in Area II, Area IV and Northern Undeveloped Area (Padre, 2014c, 2013).
Late-flowered mariposa lily *Calochortus fimbriatus*	CRPR 1B.3, LC	Chaparral and cismontane woodland; often in rocky areas or on serpentine soils. 275 to 1,905 m elevation.	**High.** The proposed remediation areas are within the range of the species, and high-quality suitable habitat, including chaparral and rocky outcrops, is abundant.
Plummer's mariposa lily *Calochortus plummerae*	CRPR 4.2, LC	Coastal scrub, chaparral, grassland, cismontane woodland, and lower montane coniferous forests; granitic, rocky soils. 90 to 1,610 m elevation.	**Present**. This species was observed in 2014 within Areas I, III, and Southern Undeveloped Area, and previously documented within Area II, Area IV and the Northern Undeveloped Area.
Peirson's morning-glory *Calystegia peirsonii*	CRPR 4.2, LC	Chaparral, chenopod scrub, cismontane woodland, coastal scrub, lower montane coniferous forest, valley and foothill grasslands. 30 to 1,500 m elevation.	**Moderate.** Suitable habitat is prevalent onsite; however, not observed during various botanical surveys.
Lewis' evening-primrose *Camissoniopsis lewisii*	CRPR 3	Coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, valley and foothill grassland; sandy or clay soils. 0 to 300 m elevation.	**Moderate.** Suitable habitat is limited onsite; however, not observed during various botanical surveys.

Species	Status	Habitat	Potential for Occurrence
Southern tarplant *Centromadia parryi* ssp. *australis*	CRPR 1B.1, LC	Edges of marshes, vernal pools and vernally mesic grasslands. 0 to 425 m elevation.	**Low.** Limited suitable habitat onsite. Sandstone vernal pools do not provide suitable habitat and mesic grasslands do not occur onsite. There is low potential that this species would be present along the edges of the marsh habitat that is present.
Island mountain-mahogany *Cercocarpus betuloides* var. *blancheae*	CRPR 4.3	Closed-cone coniferous forest and chaparral. 30 to 600 m elevation.	**Moderate.** Suitable habitat is prevalent onsite; however, this woody-perennial species, which is easy to observe, has not been observed during numerous botanical surveys.
Salt marsh bird's-beak *Chloropyron maritimum* ssp. *maritimum*	FE, SE, CRPR 1B.2	Coastal dunes, salt marshes, swamps. 0 to 30 m elevation.	**Low.** Suitable habitat not present onsite and the proposed remediation areas is outside its elevation range.
San Fernando Valley spineflower *Chorizanthe parryi* var. *fernandina*	FC, SE, CRPR 1B.1, LC	Coastal scrub and grassland; sandy soils and rocky outcrops. 3 to 1,035 m elevation.	**High.** The proposed remediation areas are within the range of the species and high-quality scrub and grassland with rocky outcrops occur throughout the project site.
Parry's spineflower *Chorizanthe parryi* var. *parryi*	CRPR 1B.1	Openings in coastal scrub, chaparral, cismontane woodland, and grassland; sandy or rocky soils. 275 to 1,220 m elevation.	**High.** The proposed remediation areas are within the known elevation range of the species, and high-quality habitat occurs throughout the project site.
Small-flowered morning-glory *Convolvulus simulans*	CRPR 4.2, LC	Openings within chaparral, coastal scrub, valley and foothill grassland; clay or serpentine seeps. 30 to 700 m elevation.	**Moderate.** Suitable habitat is prevalent onsite; however, clay soils are limited. Not observed during various botanical surveys.
Crowned forget-me-not *Cryptantha corollata*	LC	Foothill woodland and valley grassland. 240 to 1,570 m elevation.	**Moderate.** Suitable vegetation occurs in small patches onsite; however, not observed during various botanical surveys.
Santa Susana tarplant *Deinandra minthornii*	SR, CRPR1B.2	Chaparral, coastal scrub on sandstone outcrops. 280 to 760 m elevation.	**Present.** This species is prevalent onsite. The majority of the population occurs within Area IV and Northern Undeveloped Area, Area I, and Area II, and Southern Undeveloped Area (Padre, 2013).
Dune larkspur *Delphinium parryi* ssp. *blochmaniae*	CRPR 1B.2	Maritime chaparral, coastal dunes in dry, sandy soils. 0 to 200 m elevation.	**Low.** Limited habitat occurs onsite; outside elevation range.

Species	Status	Habitat	Potential for Occurrence
Mt. Pinos larkspur *Delphinium parryi* ssp. *purpureum*	CRPR 4.3	Chaparral, Mojavean desert scrub, Pinyon and juniper woodland. 1,000 to 2,600 m elevation.	**Low.** Suitable but limited habitat onsite. The site is outside of known elevation range and species not observed during various botanical surveys.
Norris' beard moss *Didymodon norrisii*	CRPR 1B.2	Cismontane woodland, lower montane conifer forest; intermittently mesic. Restricted to rocky substrates, generally serpentine, calcareous and volcanic. 600 to 1,973 m elevation.	**Moderate.** The proposed remediation area is within the known range of the species; there are few mesic areas, and rock outcrops are generally sandstone, rather than serpentine, calcareous or volcanic.
Slender-horned Spineflower *Dodecahema leptoceras*	FE, SE, CRPR 1B.1	Chaparral, coastal scrub, flood deposited terraces; sandy soils. 200 to 760 m elevation.	**Moderate.** The proposed remediation areas are within the range of the species, and suitable vegetation is prevalent onsite; however, alluvial deposits are uncommon.
Beach spectaclepod *Dithyrea maritima*	ST, CRPR 1B.1	Coastal dunes, coastal scrub; sandy soils. 3 to 50 m elevation.	**None.** Suitable habitat not present onsite; outside elevation range.
Blochman's dudleya *Dudleya blochmaniae* ssp. *blochmaniae*	CRPR 1B.1	Coastal scrub, coastal bluff scrub, and valley and foothill grassland; rocky, often clay or serpentine soils. 5 to 450 m elevation.	**Low.** Suitable vegetation is prevalent onsite. May occur on rocky outcrops; however clay or serpentine soils are limited.
Marcescent dudleya *Dudleya cymosa* ssp. *marcescens*	FT, SR, CRPR 1B.2, LC	Chaparral, rocky cliffs, volcanic soils. 150 to 520 m elevation.	**Low.** Suitable vegetation and rocky outcrops are prevalent onsite; however volcanic soils are absent.
Santa Monica Mountains dudleya *Dudleya cymosa* ssp. *ovatifolia* (inclusive of *D. c .* ssp. *agourensis*)	FT, CRPR 1B.1, LC	Chaparral and coastal scrub in rocky, volcanic slopes. 1,270 to 2,600 m elevation.	**Low.** Suitable vegetation is prevalent onsite. May occur on rocky outcrops; however volcanic soils are absent, and site is outside known elevation range.
Many-stemmed dudleya *Dudleya multicaulis*	CRPR 1B.2	Chaparral, coastal scrub, valley and foothill grassland, often in heavy clay soils. 0 to 790 m elevation.	**Low.** Suitable vegetation is prevalent onsite. May occur on rocky outcrops; however clay soils are limited.
Conejo dudleya *Dudleya parva*	FT, CRPR 1B.2, LC	Coastal scrub, valley and foothill grassland in clayey or volcanic soils and rocky hillsides. 60 to 450 m elevation.	**Low.** Suitable vegetation is fairly common onsite. May occur on rocky outcrops; however volcanic soils are absent.

Species	Status	Habitat	Potential for Occurrence
Trask yerba santa *Eriodictyon traskiae*	CRPR CBR, LC	Chaparral. 492 to 4,265 m elevation.	**Moderate.** Chaparral is prevalent onsite. However, this perennial woody species, which is easy to observe, has not been observed during numerous biological surveys.
Conejo buckwheat *Eriogonum crocatum*	SR, CRPR 1B.2, LC	Chaparral, coastal scrub, valley and foothill grassland, in rocky areas, Conejo volcanic outcrops. 50 to 580 m elevation.	**Low.** Suitable habitat is prevalent onsite; may occur within rocky areas. However, this perennial species, which is easy to observe, has not been observed during numerous biological surveys. Additionally, volcanic substrates are absent.
Palmer's grapplinghook *Harpagonella palmeri*	CRPR 4.2	Chaparral, coastal scrub, and grassland, often in clay soils. 20 to 955 m elevation.	**Moderate.** Suitable habitat occurs onsite; may occur within limited clay soils in grassland or open areas within scrub habitat.
Vernal barley *Hordeum intercedens*	CRPR 3.2	Coastal dunes, coastal scrub, valley and foothill grassland (saline flats and depressions), vernal pools. 5 to 1,000 m elevation.	**Moderate.** Suitable upland habitat is prevalent onsite but limited vernal pool habitat is present; not observed during various botanical surveys.
Mesa horkelia *Horkelia cuneata* var. *puberula*	CRPR 1B.1	Chaparral (maritime), cismontane woodland, coastal scrub; sandy or gravelly soils. 70 to 810 m elevation.	**Moderate.** Suitable habitat is prevalent onsite; however, not observed during various botanical surveys.
Decumbent goldenbush *Isocoma menziesii* var. *decumbens*	CRPR 1B.2	Chaparral and coastal sage scrub; sandy soils, often in disturbed areas. 10 to 135 m elevation.	**Moderate.** Suitable habitat and soils prevalent onsite; however, site is outside known elevation range.
Southern California black walnut *Juglans californica* var. *californica*	CRPR 4.2	Riparian corridors, mesic hillsides. 50 to 900 m elevation.	**Present.** Observed in riparian habitat within Area I, Area II, Area III, Area IV, and Southern Undeveloped Area.
Coulter's goldfields *Lasthenia glabrata* ssp. *coulteri*	CRPR 1B.1, LC	Coastal salt marshes, playas, grassland and vernal pools, often alkaline soil. 1 to 1,220 m elevation.	**Low.** Vernal pool habitats are very limited onsite and the proposed remediation areas do not support alkaline soils.
Ocellated Humboldt lily *Lilium humboldtii* ssp. *ocellatum*	CRPR 4.2	Openings within chaparral, coastal scrub, oak or riparian woodland. 30 to 1,800 m elevation.	**Present.** This species was observed in 2009 in Area II, and observed in 2014 within Southern Undeveloped Area (Padre, 2013).
Tiny poppy *Meconella denticulata*	CRPR CBR, LC	Chaparral, coastal sage scrub, shaded canyons. 0 to 3,280 m elevation.	**High.** High-quality habitat prevalent onsite. May occur in shady areas at the bottom of rocky outcrops; however, not observed during various botanical surveys.

Species	Status	Habitat	Potential for Occurrence
White-veined monardella *Monardella hypoleuca* ssp. *hypoleuca y*	CRBR 1B.3, LC	Chaparral, cismontane woodland. 50 to 1,525 m elevation.	**High.** High-quality habitat prevalent onsite.
Spreading navarretia *Navarretia fossalis*	FT, CRPR 1B.1	Vernal pools, shallow marsh, and playas. 30 to 655 m elevation.	**Low.** Suitable habitat and substrate is very limited, as most vernal pools within the proposed remediation areas consist of sandstone vernal pools that do not support appropriate substrate for this species.
Ojai navarretia *Navarretia ojaiensis*	CRPR 1B.1	Openings in chaparral, openings in coastal sage scrub, valley and foothill grassland. 275 to 620 m elevation.	**Moderate.** Suitable habitat is prevalent onsite; however, not observed during various botanical surveys.
Chaparral Nolina *Nolina cismontana*	CRPR 1B.2	Chaparral, coastal scrub, primarily on sandstone and gabbro substrates. 140 to 1,275 m elevation.	**High.** High-quality vegetation and appropriate substrate is prevalent onsite.
California Orcutt grass *Orcuttia californica*	FE, SE, CRPR 1B.1, LC	Vernal pools. 15 to 660 m elevation.	**Low.** Suitable habitat and substrate is very limited, as most vernal pools within the proposed remediation areas consist of sandstone vernal pools that do not support appropriate substrate for this species.
Lyon's pentachaeta *Pentachaeta lyonii*	FE, SE, CRPR 1B.1	Openings within chaparral, coastal scrub and valley and foothill grassland; rocky, clay or volcanic soils. 30 to 630 m elevation.	**Moderate.** Suitable habitat is prevalent onsite; may occur within rocky areas. However, volcanic substrates are absent and clay soils are limited.
Hubby's phacelia *Phacelia hubbyi*	CRPR 4.2	Chaparral, coastal scrub, valley and foothill grassland; gravelly, rocky, or talus soils. 0 to 1,000 m elevation.	**Moderate.** Suitable habitat is prevalent onsite; however, not observed during various botanical surveys.
South coast branching phacelia *Phacelia ramosissima* var. *austrolitoralis*	CRPR 3.2	Chaparral, coastal dunes, coastal scrub, marshes and swamps (coastal salt); sandy or rocky soil. 5 to300 m elevation.	**High.** High-quality habitat is prevalent onsite and *Phacelia ramosissima* was found within the project vicinity.
Western sycamore *Platanus racemosa*	VCPT	Riparian scrub and riparian forest. 0 to 6,561 m elevation.	**Present.** This species occurs within Area IV (SAIC, 2009a).

Species	Status	Habitat	Potential for Occurrence
Coast live oak *Quercus agrifolia*	VCPT	Oak woodland, riparian corridors, mesic hillsides. 0 to 4,921 m elevation.	**Present.** This species occurs within oak woodland and oak forest habitat in Area I, Area II, Area III, Area IV and Southern Undeveloped Area within coast live oak woodland (SAIC, 2009a; Padre, 2013).
Scrub oak *Quercus berberidifolia*	VCPT	Oak woodland, riparian corridors, mesic hillsides. 100 to 1,800 m elevation.	**Present.** This species occurs within oak woodland and oak forest habitat in the proposed remediation areas.
Salt spring checkerbloom *Sidalcea neomexicana*	CRPR 2B.2, LC	Chaparral, coastal scrub, lower montane coniferous forest, desert scrub, playas. Alkaline, mesic soils. 0 to 1,500 m elevation.	**Low.** Suitable vegetation is prevalent onsite; however, mesic and alkaline soils are limited or absent.
Sonoran maiden fern *Thelypteris puberula* var. *sonorensis*	CRPR 2B.2	Meadows, seeps, and streams. 50 to 610 m elevation.	**Low.** Suitable habitat very limited onsite. The drainages within the project site are ephemeral and not moist and shaded enough to support maiden fern.
California screw moss *Tortula californica*	CRPR 1B.2	Chenopod scrub, grassland; sandy soils. 10 to 1,460 m elevation.	**Moderate.** Sandy soils are prevalent onsite; however, suitable vegetation type is limited and assemblage is less than ideal.

Notes

Status Codes:
Federal: FE Federal Endangered, FT Federal Threatened: FC Federal Candidate (USFWS); FT-PD Federal Threatened, proposed for de-listing (USFWS)
State: SEP State Emergency Protection (initiated by CDFW on 12/3/14 for 6 months pending further evaluation), SE State Endangered, ST State Threatened, SR State Rare; SFP Fully protected (CDFW); SC State Candidate (CDFW); SSC California Species of Special Concern (CDFW); WL Watch List (CDFW); CDFS Sensitive Species (California Department of Forestry and Fire Protection)
Local: LC Species of Local Concern (Ventura County), VCPT Ventura County Protected Tree.
CRPR
CBR considered, but rejected;
CRPR 1A Plants presumed extinct in California;
CRPR 1B Plants considered rare, threatened or endangered in California and elsewhere;
CRPR 2 Plants considered rare, threatened or endangered in California, more common elsewhere;
CRPR 3 Plants for which more information is needed, review list;
CRPR 4 Limited distribution, watch list.
CRPR Threat Ranks: 0.1 Seriously threatened in California (over 80 percent of occurrences threatened / high degree and immediacy of threat);
0.2 Fairly threatened in California (20-80 percent occurrences threatened / moderate degree and immediacy of threat);
0.3 Not very threatened in California (<20 percent of occurrences threatened / low degree and immediacy of threat or no current threats known).
SOURCE: USFWS, 2014; CNDDB, 2015a; CNDDB, 2015b; CNPS, 2015; Ventura County, 2014a.

TABLE 4.3-4
SPECIAL-STATUS WILDLIFE SPECIES DOCUMENTED IN THE PROJECT REGION

Species	Status/CNDDB Element Ranking	Habitat	Potential for Occurrence
Invertebrates			
Santa Monica shieldback katydid *Aglaothorax longipennis*	S1S2	Chaparral and canyon stream bottom vegetation in the Santa Monica Mountains	**Low.** Canyon stream bottoms are absent from the proposed remediation. Additionally, this species is restricted to the Santa Monica Mountains.
Vernal pool fairy shrimp *Branchinecta lynchi*	FT, S2S3	Vernal pools	**Moderate.** The project site is within the range of the species. The potential sandstone vernal pools are capable of supporting this species. This species was not observed during a mid-season fairy shrimp survey conducted in 2010; however, wet season protocol surveys for fairy shrimp have not been conducted to determine presence or absence.
Sandy beach tiger beetle *Cicindela hirticollis gravida*	S1	Coastal dunes	**None.** Suitable habitat not present onsite.
Globus dune beetle *Coelus globosus*	S1S2	Coastal dunes	**None.** Suitable habitat not present onsite.
Monarch butterfly *Danaus plexippus*	S3	In winter roosts along coastal southern California; roosts in woodlands or groves with nectar and water sources nearby	**Low.** Suitable winter roosting habitat limited or absent onsite. The known distribution of this species is restricted to the coast.
Quino checkerspot *Euphydryas editha quino*	FE, S1	Coastal sage scrub, chaparral, meadows	**Low.** The Quino checkerspot has not been documented in Ventura County for at least 70 years; however, the USFWS considers this species to be potentially resident in Ventura County. Suitable habitat containing abundant larval host plants is limited onsite, and the nearest known populations occur in Riverside County.
Slotted lancetooth snail *Haplotrema caelatum*	LC	Marshes, swamps, and floodplains	**Low.** Suitable habitat is limited onsite. Not observed during various biological surveys but focused surveys for this species have not been conducted.

Species	Status/CNDDB Element Ranking	Habitat	Potential for Occurrence
Zaca shoulderband snail *Helminthoglypta phlyctaena*	LC	Chaparral, woodlands	**Moderate.** Suitable habitat occurs onsite. Not observed during various biological surveys, but focused surveys for this species have not been conducted.
Sage shoulderband snail *Helminthoglypta salvia*	LC	Semi-arid, often amongst Great Basin sagebrush (*Artemesia tridentate*)	**Low.** Improper assemblage of desired vegetation occurs onsite. Not observed during various biological surveys but focused surveys for this species have not been conducted.
Ventura shoulderband snail *Helminthoglypta venturensis*	LC	Riparian, grassland	**Moderate.** Suitable habitat occurs onsite. Not observed during various biological surveys but focused surveys for this species have not been conducted.
Matilija shoulderband snail *Helminthoglypta willeti*	LC	Oak woodlands, riparian habitats often within riverine, intermittent streambeds	**Moderate.** Suitable habitat occurs onsite Not observed during various biological surveys but focused surveys for this species have not been conducted.
Gertsch's socalchemmis spider *Socalchemmis gertschi*	S1	Sage scrub, chaparral, oak woodland, coniferous forest; generally on rocky substrate	**High.** High-quality habitat occurs throughout the site. This species would occur within the rocky outcrops.
Riverside fairy shrimp *Streptocephalus woottoni*	FE, S1S2	Vernal pools	**Moderate.** The proposed remediation areas are within the range of the species. The potential sandstone vernal pools and previously excavated areas (from removal of infrastructure or previous remediation) are capable of supporting this species. This species was not observed during a mid-season fairy shrimp survey conducted in 2010; however, wet season protocol surveys for fairy shrimp have not been conducted to determine presence or absence.
Walking stick *Timema monikensis*	LC	Chaparral habitat.	**Moderate.** Suitable habitat is prevalent onsite. Not observed during various biological surveys.
Santa Monica grasshopper *Trimerotropis occidentiloides*	S1S2	Chaparral on bare hillsides or along dirt trails	**Moderate.** Suitable habitat is prevalent onsite.

Species	Status/CNDDB Element Ranking	Habitat	Potential for Occurrence
Fish			
Prickly sculpin *Cottus asper*	LC	Fresh or saltwater habitats, commonly inhabiting low elevation waters. Not found in highly polluted waters.	**None.** No perennial streams onsite to support this species.
Tidewater goby *Eucyclogobius newberryi*	FE, SSC, S2S3	Lagoons formed by streams running into the sea; water is cool, brackish and slow moving; sandy bottom	**None.** Suitable habitat not present onsite.
Threespine stickleback *Gasterosteus aculeatus microcephalus*	LC	Shallow and slow fresh or saltwater with aquatic cover or overhanging brush	**None.** No perennial streams onsite to support this species.
Arroyo chub *Gila orcutti*	SSC, S2	Slow water streams with mud or sand bottoms	**None.** Habitat for fish (permanent surface flow, pools and runs) is absent from the project site.
Pacific lamprey *Lampetra tridentata*	LC	Freshwater streams or saltwater	**None.** No perennial streams onsite to support this species.
Southern steelhead – so. California DPS *Oncorhynchus mykiss irideus*	FE, SSC, S1	Freshwater streams or lakes	**None.** Habitat for fish (permanent surface flow, pools and runs) is absent from the project site.
Amphibians			
Arroyo toad *Anaxyrus californicus*	FE, SSC, S2S3	Semi-arid regions near intermittent streams with exposed sandy banks, stable terraces, scattered vegetation and pools	**None.** Suitable habitat absent from the site.
Arboreal salamander *Aneides lugubris*	LC	Coast live oak woodlands, coastal sand dunes, riparian woodlands	**Moderate.** Suitable habitat throughout the site. Not observed during various biological surveys; however, appropriate surveys for this species have not been conducted.
California red-legged frog *Rana draytonii*	FT, SSC, S2S3	Streams with slow-moving water and deep pools; dense, shrubby riparian vegetation at pool edges	**Low.** USFWS-designated critical habitat occurs west of the project site and overlaps slightly within the site. Limited areas of suitable habitat occur onsite in outfall ponds and Silvernale Pond. These ponds are isolated from known populations of this species. Surveys conducted in 2009 within suitable habitat within Areas II, III, IV and adjacent undeveloped lands were negative.

Species	Status/CNDDB Element Ranking	Habitat	Potential for Occurrence
Western spadefoot *Spea hammondii*	SSC, S3	Vernal pools	**Present.** Observed within Area I. Suitable habitat exists elsewhere within the project site in flat areas consisting of grasslands and disturbed areas capable of supporting pools after rain events.
Coast range newt *Taricha torosa torosa*	SSC, S4	Riverine, riparian, riparian scrub, grassland, and coastal scrub (overwintering and dispersal)	**Low.** Observed in pools in the northern drainage on Brandeis-Bardin Institute property adjacent to the site. However, low quality and limited habitat occurs on the proposed remediation areas.
Reptiles			
Western pond turtle *Actinemys marmorata*	SSC, S3	Permanent bodies of water such as stream pools or vegetated ponds. Require basking sites such as logs, vegetation mats or exposed banks; below 2,000 m	**Moderate.** Limited areas of suitable habitat occur onsite in outfall ponds and Silvernale pond. This species has not been observed onsite during various field surveys. The ponds onsite are isolated from known populations.
Silvery legless lizard *Anniella pulchra pulchra*	SSC, S3	Woodlands under leaf litter	**Present.** This species has been documented throughout the project site and is assumed present within all woodland areas within the project site.
California glossy snake *Arizona elegans occidentalis*	LC	Arid scrub, rocky washes, grasslands, chaparral	**Moderate.** Suitable habitat throughout the site. Not observed during various biological surveys.
Coastal western whiptail *Aspidoscelis tigris stejnegeri*	S2S3	Scrubland, grassland, or woodlands	**Present.** This species has been observed within Area I, Area IV, Area II, and Northern and Southern Undeveloped Area and is assumed present within all scrubland, grassland, and woodland communities on the site.
San Bernardino ring-neck snake *Diadophis punctatus modestus*	S2?	Woodlands and stream banks	**Present.** This species has been observed in Area I and Area IV within the project site and is assumed present within all woodland and streambank areas on the site.
California mountain kingsnake *Lampropeltis zonata pulchra*	SSC, LC, S2?	Scrub or woodland habitat	**Moderate.** The Venturan coastal sage scrub and oak woodland habitats within the project site provide suitable habitat; however, this species has not been observed during various surveys that have been conducted at the project site.

Species	Status/CNDDB Element Ranking	Habitat	Potential for Occurrence
Coast horned lizard *Phrynosoma blainvillii*	SSC, S3S4	Scrubland, grassland, or woodlands	**Present.** This species has been observed in areas administered by Area I, Southern Undeveloped Area, Area II, and Area IV and is assumed present within all scrubland, grassland, and woodland communities on the site.
Coast patch-nosed snake *Salvadora hexalepis virgultea*	SSC, S2S3	Grasslands, chaparral	**Present.** This species has been observed within Southern Undeveloped Area and near Sage Ranch Park, and is assumed present within all grassland and chaparral communities on the site.
Two-striped garter snake *Thamnophis hammondii*	SSC, S3S4	Scrub, grassland or woodland habitat near streams or ponds	**Present.** Observed within Area I, Area III and Area IV property and is assumed present within all scrubland, grassland, and woodland communities located near perennial water sources on the site.
Birds			
Cooper's hawk *Accipiter cooperi*	WL (nesting), S4	Woodlands near riparian zones	**Present.** Observed in Area II, Area I, and Area IV, but is expected throughout the project site.
Sharp-shinned hawk *Accipiter striatus*	WL (nesting), S4	Woodlands near riparian zones	**Present.** Observed on Area I and Area IV.
Tri-colored blackbird *Agelaius tricolor*	SSC, S1S2 (nesting colony)	Cattail and bulrush thickets, open water	**Moderate.** The cattail marsh around Silvernale Pond is suitable for supporting this species; however, this species has not been observed during various surveys that have been conducted.
So. California rufous crowned sparrow *Aimophila ruficeps canescens*	WL, S2S3	Chaparral, coastal sage scrub	**Present.** Observed in scrub habitat in Area I, and Southern Undeveloped Area.
Golden eagle *Aquila chrysaetos*	BEPA; FP, CDFS, WL, S3 (nesting & wintering)	Rolling foothill mountain areas	**Present.** An active nest was observed adjacent to the northern boundary of the project site Northern Undeveloped Area. Suitable nesting and foraging habitat occurs within the oak woodland communities throughout the project site.
Great blue heron *Ardea Herodias*	CDFS, S4 (nesting colony)	Freshwater and saltwater habitats; may forage in meadows or agricultural areas	**Present.** Individuals observed in Area II, Area III and Area IV.

Species	Status/CNDDB Element Ranking	Habitat	Potential for Occurrence
Bell's sage sparrow *Artemisiospiza belli belli*	BCC, WL, S2?	Chaparral, coastal sage scrub	**Present.** Observed in 2014 within the Southern Undeveloped Area.
Burrowing owl *Athene cunicularia*	BCC, SSC, S3 (burrow sites and some wintering sites)	Flat, open, dry annual or perennial grasslands, deserts or scrublands	**Moderate.** The grassland habitat within the project site provides suitable habitat; however, burrowing owls have never been observed during the various surveys that have been conducted.
Swainson's hawk Buteo swainsoni	BCC, ST, S3 (nesting)	Nest in large trees near grasslands and agricultural fields, which are used for foraging	**Moderate.** Adequate foraging and nesting habitat occurs in grasslands and large trees near grasslands.
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	FT, BCC, SE, S1 (nesting)	Cottonwood willow riparian habitat with high canopy cover and dense understory	**Low.** This species is restrictive in its habitat preferences. Suitable habitat is absent onsite.
Yellow warbler *Setophaga (Dendrioca) petechia brewsteri*	BCC, SSC, S3S4 (nesting)	Riparian woodlands and thickets, often along water courses or wetlands	**Present.** Observed in 2010 foraging in the Northern Drainage (Northern Undeveloped Area and Area I). Limited high-quality habitat occurs on the project site; as such, this species may not breed onsite.
White-tailed kite *Elanus leucurus*	FP, S3S4 (nesting)	Grasslands, meadows, farmlands	**Present.** This species has been observed within Area I.
Southwestern willow flycatcher *Empidonax traillii extimus*	FE, SE, S1 (nesting)	Dense, closed canopy willow and other riparian habitats near open water	**Low.** Suitable habitat extremely limited onsite.
American peregrine falcon *Falco peregrinus anatum*	BCC, FP, CDFS, S3S4 (nesting)	Grassland, scrub, and forest habitats from sea level to 4,000 m elevation; cliffs or tall buildings within 1 mile of open water.	**Present.** This species was observed within Area IV.
California condor *Gymnogyps californianus*	FE, SE, FP, CDFS, S1	Steep, rugged canyons, gorges and forested mountains with dense brush	**Low.** USFWS identified this species as having potential to occur (HydroGeoLogic 2010). However, the project site falls outside of the known range for the species. California condor has never been observed at the proposed remediation areas during various biological surveys.
Yellow-breasted chat *Icteria virens*	SSC, S3 (nesting)	Riparian woodlands and dense riparian scrub	**High.** May forage or migrate onsite; however, limited suitable nesting habitat is present.

Species	Status/CNDDB Element Ranking	Habitat	Potential for Occurrence
Loggerhead shrike *Lanius ludovicianus*	BCC, SSC, S4 (nesting)	Woodlands, shrublands.	**Present.** Observed on lands throughout the project site
Double-crested cormorant *Phalacrocorax auritus*	WL, S4 (nesting colony)	Freshwater and saltwater habitats; may forage in meadows or agricultural areas	**Present.** Observed in Area IV and Silvernale Pond (Area III).
Coastal California gnatcatcher *Polioptila californica californica*	FT, SSC, S2	Coastal sage scrub. Below 800 m elevation in southern California	**Moderate.** Suitable habitat occurs within Venturan coastal sage scrub habitat throughout the proposed remediation areas. Focused surveys for this species have been conducted in Area IV and Northern Undeveloped Area from 2010 to 2012 with negative findings.
Bank swallow *Riparia riparia*	ST, S2S3 (nesting)	Nests in colonies along vertical stream banks or bluffs of friable soil	**Low.** Suitable habitat limited onsite and this species has never been observed during various biological surveys.
Least Bell's vireo *Vireo bellii pusillus*	FE, SE, S2 (nesting)	Willow and other riparian habitats. Below 700 m elevation	**Present.** Observed on Area II but presumed a migrant. None were observed during 2011 breeding season surveys, nor were any observed during surveys conducted in 2012 within Area II, Area IV, and Northern Undeveloped Area.
Mammals			
Pallid bat *Antrozous pallidus*	SSC, S3	Roosting: crevices in cliff faces, caves, buildings, etc. Foraging: woodlands, coastal scrub, grasslands, chaparral	**Present.** Observed within Area I and Area III during Spring 2014 surveys.
Townsend's big-eared bat *Corynorhinus townsendii*	SC, SSC, S2	Roosting: caves, mine shafts or other open cavities. Foraging: woodlands, coastal scrub, grasslands, chaparral	**Present.** Observed within Area I and Area III during Spring 2014 surveys.
Spotted bat *Euderma maculatum*	SSC, S3	Forests, woodland, grassland, and marsh near cliffs from sea level to 2,700 m elevation	**High.** Suitable habitat occurs throughout the site.
California mastiff bat *Eumops perotis californicus*	SSC, S3S4	Roosting: crevices in cliff faces, caves, buildings, etc. Foraging: woodlands, coastal scrub, grasslands, chaparral	**Present.** Observed within Area I and Area III during spring 2014 surveys.

Species	Status/CNDDB Element Ranking	Habitat	Potential for Occurrence
Western red bat *Lasiurus blossevillii*	SSC, S3	Riparian forest	**Present.** Observed within Area I and Area III during spring 2014 surveys.
Hoary bat *Lasiurus cinereus*	FGC, S4	Forest and woodland near a water source	**Present.** Observed within Area I and Area III during spring 2014 surveys.
California leaf-nosed bat *Macrotus californicus*	SSC, S3	Roosting: crevices in cliff faces, caves, buildings, mines, etc. Foraging: woodlands, coastal scrub, grasslands, chaparral	**Present.** Observed within Area I and Area III during spring 2014 surveys.
Western small-footed myotis *Myotis ciliolabrum*	S3	Roosting: crevices in cliff faces, caves, buildings, etc. Foraging: woodlands, water sources	**Present.** Observed within Area I and Area III during spring 2014 surveys.
Yuma myotis *Myotis yumanensis*	FGC, S4	Riparian, scrub, and forest habitats near a source of water	**Present.** Observed within Area I and Area III during spring 2014 surveys.
Ringtail *Bassariscus astutus*	FP	Riparian and other shrubby habitats	**Present.** Observed within Area IV.
San Diego black-tailed jackrabbit *Lepus californicus bennettii*	SSC, S3S4	Chaparral or other early-stage forest habitats	**Present.** Observed in Area IV.
Bobcat *Lynx rufus*	FGC	Scrub, grassland, woodland and forest habitats	**Present.** Observed in Area I, Area II, Area III, Area IV and Southern Undeveloped Area.
Mt. Pinos lodgepole chipmunk *Neotamias speciosus callipeplus*	LC	Found on the upper slopes and summits of Mount Pinos, Mount Abel, and Frazier Mountain in the Los Padres National Forest. Inhabit old logs, rock outcroppings, and other forest debris. Trees are an important habitat component.	**None.** Outside of known species habitat range. Not observed during various biological surveys.
San Diego desert woodrat *Neotoma lepida intermedia*	SSC, S3S4	Chaparral and other habitats, building houses at base of tree or cliffs	**Present.** Observed within Area I.

Species	Status/CNDDB Element Ranking	Habitat	Potential for Occurrence
Mule deer *Odocoileus hemionus*	FGC	Scrub, grassland, woodland and forest habitats	**Present.** Observed in Area I, Area II, Area III, Area IV, and Southern Undeveloped Area.
Los Angeles little pocket mouse *Perognathus longimembris brevinasus*	SSC, S1S2	Grassland and scrub habitats with friable, sandy soils	**Present.** Observed in Area IV.
American badger *Taxidea taxus*	SSC, S3	Grassland, open shrubland, forest or desert habitats with friable soils	**Low.** Areas of grassland and shrubland occur onsite; however, much of the area consists of very steep topography and non-friable soils.

Notes

Status Codes:
Federal: FE Federal Endangered, FT Federal Threatened: FC Federal Candidate (USFWS); FT-PD Federal Threatened, proposed for de-listing (USFWS); BEPA Bald Eagle and Golden Eagle Protection Act (USFWS); BCC Birds of Conservation Concern (USFWS).
State: SEP State Emergency Protection (initiated by CDFW on 12/3/14 for 6 months pending further evaluation), SE State Endangered, ST State Threatened, SR State Rare; SFP Fully protected (CDFW); SC State Candidate (CDFW); SSC California Species of Special Concern (CDFW); WL Watch List (CDFW); CDFS Sensitive Species (California Department of Forestry and Fire Protection); FGC (Fish and Game Code Sections 1801-1802, 2000-2021.5).
Local: LC Species of Local Concern (Ventura County).
Other: AWL Audubon Watch List; USBC U.S. Bird Conservation Watch List.

CNDDB Element Ranking
S1 Critically Imperiled – Critically imperiled in the state because of extreme rarity (often 5 or few populations) or because of factor(s) such as very steep declines making it especially vulnerable to extirpation from the state.
S2 Imperiled – Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state.
S3 Vulnerable – Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer).
S4 Apparently Secure – Uncommon but not rare in the state; some cause for long-term concern due to declines or other factors.
A question mark (?) denotes an inexact numeric rank due to insufficient samples over the full expected range of the type, but existing information points to this rank.

SOURCE: USFWS, 2014; CNDDB, 2015a; CNDDB, 2015b; Ventura County, 2014b.

Slender mariposa lily

Slender mariposa lily is a perennial bulbiferous herb occurring in chaparral, coastal scrub, and valley and foothill grasslands from 320 to 1,000 meters (approximately 1,000 to 3,300 feet). It is a subspecies of clubhair mariposa lily. Clubhair mariposa lily ranges from central to southern California whereas its subspecies, slender mariposa lily, occurs in the Western Transverse Ranges and San Gabriel Mountains in Ventura and Los Angeles Counties. Slender mariposa lily is endemic to California and is ranked by the CNPS as CRPR 1B.2 (Rare-Fairly Endangered). This species is absent within the Southern Undeveloped Area but has been documented in Area II, Area IV and Northern Undeveloped Area (Padre, 2014c, 2013).

Plummer's mariposa lily

Plummer's mariposa lily is a perennial bulbiferous herb that occurs in granitic and rocky areas in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and valley and foothill grassland below 1,700 meters (approximately 5,500 feet). This species is endemic to the South Coast and Peninsular Ranges of California in Los Angeles, Orange, Riverside, San Bernardino and Ventura counties. Plummer's mariposa lily is ranked by the CNPS as CRPR 4.2 (Plants of Limited Distribution-Fairly Threatened). This species has been observed in 2014 within Area I, III and Southern Undeveloped Area, and has also been documented in Area II and Area IV.

Santa Susana tarplant

Santa Susana tarplant is a perennial, subshrub or shrub that occurs in chaparral and coastal scrub habitats from 200 to 800 meters (approximately 650 to 2,500 feet) in well-drained sandy soils and rocky areas, particularly sandstone bluffs and outcrops. It is endemic to the Santa Susana and Santa Monica Mountains in Ventura and Los Angeles Counties. Santa Susana tarplant is state listed as Rare and is ranked by the CNPS as CRPR 1B.2 (Rare-Fairly Threatened). This species has been throughout the project site, with the majority of the populations occurring within Area I, Area II, Area IV and the Northern Undeveloped Area.

Southern California black walnut

Southern California black walnut is a broad-leaved, deciduous, single or multi -trunk tree up to 25 meters in height that is endemic to chaparral, foothill woodland, coastal sage scrub and wetland-riparian habitats in Santa Barbara, Ventura, Los Angeles, Orange, San Bernardino, Riverside, and San Diego Counties. Although frequently co-dominant with coast live oak in oak or walnut woodlands, isolated stands of southern California walnut sometimes occur in chaparral or coastal sage scrub. Southern California black walnut is ranked by the CNPS as CRPR 4.2 (Plants of Limited Distribution-Fairly Threatened). This species was observed in riparian habitat within Area IV, Area II, and within numerous locations within Area I and Southern Undeveloped Area.

Ocellated Humboldt lily

Ocellated Humboldt lily is a perennial bulbiferous herb that occurs in openings in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, riparian woodland 30 to 1,800 meters in elevation (approximately 100 to 6,000 feet). It is endemic to California in San Diego, Los Angeles, Ventura, Santa Barbara, San Bernardino, Riverside, San Luis Obispo and

Orange Counties, as well as on Santa Cruz and Santa Rosa Islands. Ocellated Humboldt lily is ranked by the CNPS as CRPR 4.2 (Plants of Limited Distribution-Fairly Threatened). This species was observed in 2009 in Area II and in 2014 within the Southern Undeveloped Area.

Western sycamore

Western sycamore is a deciduous tree to 35 meters in height that is native to California in streamsides, canyons and arroyos below 2,000 meters (approximately 6,000 feet) in elevation. It occurs in the Cascade Range foothills, Sierra Nevada foothills, Tehachapi Mountains, Great Central Valley, central western California, southwestern California, Mojave Desert (Mojave River), Sonoran Desert and northwestern Baja California. Western sycamore is considered a protected tree in accordance with the Ventura County Tree Protection Ordinance. This species has been observed within Area IV.

Coast live oak

Coast live oak is a small-leaved, evergreen oak occurring in the lower-elevation oak woodlands of California. Oak woodlands occupy roughly 10 million acres in the state and may be classified as northern, southern, and foothill woodlands. Southern oak woodlands are dominated by the coast live oak, and typically occurs up to 5,000 feet in elevation. Coast live oak is protected in accordance with the Ventura County Tree Protection Ordinance. This species has been observed in the project site within oak woodland and oak forest habitat at multiple locations throughout the project site, including Area I, Area II, Area III, Area IV and Southern Undeveloped Area within coast live oak woodland (SAIC, 2009a; Padre, 2013).

Scrub oak

Scrub oak (*Quercus berberidifolia*) is an evergreen that is commonly found in higher elevations of chaparral, and occasionally associated with coastal sage scrub near the coast. Scrub oak occurs in the northern coast of California, all the way down through the southern coast of Mexico in areas ranging from approximately 30 to 6,500 feet in elevation. This species typically requires 11 to 65 inches of rain per year and grows in a variety of soils derived from granitic material, sandstone, or andesite. Scrub oak is protected in accordance with the Ventura County Tree Protection Ordinance. This species has been observed in the project site within oak woodland and oak forest habitat.

Special-Status Wildlife

A total of 73 special-status wildlife species have been recorded in the region, 33 of which have been observed within the project site. An additional 18 special-status wildlife species were determined to have a moderate to high potential to occur within the project site. The remaining 22 wildlife species were determined to have low potential or no potential for occurrence because the project site provides low quality habitat, or does not support the desired habitats in which they occur. The following text discusses the special-status wildlife species found to be present on the site, have a moderate or high potential to occur on the project site, or that were identified on the USFWS species list for the project.

Special-Status Invertebrates

No special-status invertebrates have been documented within the project site. Special-status invertebrates with a moderate or high potential to occur include vernal pool fairy shrimp (*Branchinecta lynchi*; federally threatened), Gertsch's socalchemmis spider (*Socalchemmis gertschi*), Riverside fairy shrimp (*Streptocephalus woottoni*; federally endangered), and Santa Monica grasshopper (*Trimerotropis occidentiloides*). Invertebrates that are considered by Ventura County to be locally important species and potentially occur in the project site include Zaca shoulderband snail (*Helminthoglypta phlyctaena*), Ventura shoulderband snail (*Helminthoglypta venturensis),* Matilija shoulderband snail (*Helminthoglypta willeti*), and walking stick (*Timema monikensis*).

In 2010, a mid-season fairy shrimp survey was conducted at several selected sandstone pools (one in Area I, and three in Area IV), and in 2014 and 2015 a vernal pool fairy shrimp habitat assessment was conducted within Areas I, II and portions of the Southern Undeveloped Area in the vicinity of the remediation areas (Padre, 2010, 2014d, 2015b). Suitable fairy shrimp habitat was observed as depressions in sandstone outcrops that contain standing water for part of the year; however, only common fairy shrimp species were documented.

Quino checkerspot butterfly (*Euphydryas editha quino*; federally endangered) has not been documented within Ventura County for the last 70 years (FSC, 2010); however, USFWS has indicated this species potentially occurs in the project site (USFWS, 2014). Habitat assessments for this species performed within Area IV in 2010 and within Areas I and II in 2014 (Arnold, 2012) concluded that although there are biological and physical factors onsite that are suitable for the Quino checkerspot butterfly, it is unlikely that the site supports this species due to limited larval nectar host plants, high levels of disturbance, and isolation from known extant populations. Therefore, this species is considered to have a low potential to occur within the project site and is not further analyzed in this PEIR.

Special-Status Fish

No special-status fish species are known to occur within the project site. Due to the absence of permanent surface flow, pools, and perennial or intermittent streams, special-status fish are not expected to occur in the project site.

Special-Status Amphibians

One special-status amphibian species, the western spadefoot toad (CDFW Species of Special Concern) has been observed within Area I in 2010 in a detention basin at CRL-III (Padre, 2012). In 2014, after Boeing's demolition of the former bowl test stands, a western spade toad was observed in a plastic-lined depression at the former bowl area test stand location. Suitable habitat exists elsewhere within the project site in flat grassland areas and disturbed areas capable of supporting seasonal pools after rain events.

California red-legged frog (*Rana draytonii*; federally threatened/CDFW Species of Special Concern) has a low potential to occur onsite. This species requires riparian habitats, including permanent surface water or pools to breed. The habitat onsite is limited to a small number of

artificially created ponds and pools, which support marginal wetland habitat and are isolated from one another. Numerous aquatic herpetological surveys have been conducted at the project site resulting in no observations of the species. The nearest known occurrence of California red-legged frog is within Las Virgenes Creek (CNDDB, 2015b), approximately three miles south of the project site. However, since USFWS (2010) has indicated that it is possible for this species to occur within the project site based on nearby records, site conditions, and information contained in the revised critical habitat designation, California red-legged frog will be further addressed in the impact analysis.

The project site supports suitable habitat for the arboreal salamander (*Aneides lugubris*), which is considered a Ventura County locally important species.

Special-Status Reptiles

A total of four CDFW Species of Special Concern reptiles have been observed within the project site: silvery legless lizard (*Anniella pulchra pulchra*), coast horned lizard (*Phrynosoma blainvillei*), coast patch-nosed snake (*Salvadora hexalepis virgultea*), and two-striped garter snake (*Thamnophis hammondii*); and two Ventura County Locally Important Species - coastal western whiptail (*Aspidoscelis tigris stejnegeri*) and San Bernardino ring-neck snake (*Diadophis punctatus modestus*).

Western pond turtle (*Actinemys marmorata*; CDFW Species of Special Concern) has a moderate potential to occur onsite within Silvernale Pond and other onsite perennial water sources. However, this species has not been observed at the project site during numerous aquatic surveys (Padre, 2013). Western pond turtles require permanent bodies of water with suitable features for basking, such as logs and boulders. This type of habitat is limited onsite to a small number of isolated human-created ponds with marginal wetland vegetation. The nearest known occurrence is in Box Canyon, approximately 1.3 miles northeast of the project site, separated by steep, rocky outcrops and xeric vegetation.

The project site supports suitable habitat for California glossy snake (*Arizona elegans occidentalis*), which is considered a Ventura County locally important species.

Special-Status Birds

A variety of special-status avian species have been observed within the project site, all of which are CDFW Species of Special Concern, Audubon Watch List and/or USFWS Bird of Conservation Concern - Cooper's hawk (*Accipiter cooperi*), sharp-shinned hawk (*Accipiter striatus*), Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), Bell's sage sparrow (*Artemisiospiza belli belli*), yellow warbler (*Setophaga petechia brewsteri*), loggerhead shrike (*Lanius ludovicianus*), and least Bell's vireo (*Vireo bellii pusillus*; Federally and State Endangered). An individual least Bell's vireo was observed foraging in Area II, outside of the breeding season (NASA, 2014a). The great blue heron (*Ardea herodias*) and double-crested cormorant (*Phalacrocorax auritus*) have been observed in the project site; however, their protective status only applies to nesting colonies, which do not occur on the project site. Three CDFW Fully Protected Species, golden eagle (*Aquila chrysaetos)*, white-tailed kite (*Elanus*

leucurus), and American peregrine falcon (*Falco peregrinus anatum)*, have been observed within or adjacent to the project site, and an active golden eagle nest has been observed within the Northern Undeveloped Area.

A variety of additional special-status avian species have the potential to occur onsite, including burrowing owl (*Athene cunicularia*; USFWS Bird of Conservation Concern/CDFW Species of Special Concern); and, Swainson's hawk (*Buteo swainsoni*; USFWS Bird of Conservation Concern/State Threatened). California condor (*Gymnogyps californianus*; Federally and State Endangered) has the potential to forage onsite; however, the project site is located outside of the current known range of the condor (HydroGeoLogic, 2010); therefore, this species is not evaluated further in this document.

Sensitive riparian birds with a moderate potential to occur within Boeing areas include tricolored blackbird (*Agelaius tricolor;* state Candidate) and yellow-breasted chat (*Icteria virens*; CDFW Species of Special Concern [nesting]). Yellow-breasted chat and least Bell's vireo have similar habitat needs to the yellow warbler, which was observed foraging in Area I (Padre, 2013). Suitable nesting habitat for these species, generally consisting of riparian scrub and extensive stands of emergent wetland vegetation, is sparse onsite.

The coastal California gnatcatcher (*Polioptila californica californica*; Federally Threatened/ CDFW Species of Special Concern) prefers coastal sage scrub habitat for breeding and foraging; therefore, this species has a moderate potential to occur onsite due to the extensive community of Venturan coastal sage scrub that is present throughout the project site and because the project site is within the known range of distribution. However, no individuals were detected during focused surveys conducted in 2010–2012 in Area IV and the Northern Undeveloped Area (Griffith, 2010, 2011, 2012).

Special-Status Mammals

A total of 14 special-status mammal species have been documented in the project site, including eight special-status bat species. An acoustical bat survey conducted in 2014 (Forde, 2014) within remediation areas of Area I identified the following eight special-status bat species: pallid bat (*Antrozous pallidus*; CDFW Species of Special Concern), Townsend's big-eared bat (*Corynorhinus townsendii*; State Candidate/CDFW Species of Special Concern), California mastiff bat (*Eumops perotis californicus*; CDFW Species of Special Concern), western red bat (*Lasiurus blossevillii*; CDFW Species of Special Concern), hoary bat (*Lasiurus cinereus*), California leaf-nosed bat (*Macrotus californicus*; CDFW Species of Special Concern), western small-footed myotis (*Myotis ciliolabrum*), and yuma myotis (*Myotis yumanensis*). Spotted bat (*Euderma maculatum*; CDFW Species of Special Concern) has a high potential to occur, as it has similar habitat requirements as to the other special-status bat species that were detected. Ringtail (*Bassariscus astutus*; CDFW Fully Protected), bobcat (*Lynx rufus*), San Diego desert woodrat (*Neotoma lepida intermedia*), and mule deer (*Odocoileus hemionus*) were also observed during various biological surveys conducted between 2005 and 2013 (Padre, 2013). Two additional CDFW Species of Special Concern have been documented in the project site - San Diego black-tailed jackrabbit (*Lepus californicus*) and Los Angeles little pocket mouse (*Perognathus longimembris brevinasus*).

Special-Status Amphibian Species Descriptions

Western spadefoot.

Western spadefoot is a 3.8- to 6.3-centimeter-long, stout-bodied, terrestrial toad with green or grey dorsal coloration and relatively smooth skin. Spadefoots feature enlarged, spade-like hind feet for digging. The western spadefoot prefers areas of open vegetation and short grasses in lowland habitats and also in the foothills and mountains throughout the Central Valley and adjacent foothills, in the Coast Ranges from Santa Barbara County south to the Mexican border at elevations to 1,363 meters. All habitats must have dry, upland areas for feeding and burrowing, and nearby wetlands for breeding. Western spadefoot is a CDFW-designated Species of Special Concern, and has been discovered breeding in a former detention basin within Area I.

Special-Status Reptile Species Descriptions

Silvery legless lizard

Silvery legless lizard is a slim-bodied, 11- to 18-centimeter-long (snout to vent), legless lizard with highly variable dorsal coloration. It occurs in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks from northern Contra Costa County south to Ventura County, as well as in scattered locations in the San Joaquin Valley, southern Sierra Nevada mountains, Tehachapi Mountains and part of the San Gabriel Mountains to around 1,800 meters in elevation. Silvery legless lizard is a CDFW-designated Species of Special Concern, and has been documented in throughout the project site. This species has been observed in upland oak woodland habitat, open grassland, and on several occasions in the Northern Drainage, but can inhabit other habitat types as it is a fossorial (underground) species.

Coastal western whiptail

Coastal western whiptail species is a slim-bodied, 6- to 12.7-centimeter-long (snout to vent), lizard with grey to brown coloration, dorsal mottling and a very long tail. This subspecies occurs in hot and dry open areas with sparse foliage in chaparral, woodland, and riparian habitats ranging in coastal southern California, mostly west of the Peninsular Ranges and south of the Transverse Ranges, north into Ventura County and south into Baja California to 2,130 meters. Coastal western whiptail is a CDFW-designated Species of Special Concern, and has been observed within suitable habitat throughout the project site.

San Bernardino ring-neck snake

San Bernardino ring-neck snake is a small, slim-bodied (28- to 42-centimeter-long) snake with gray to black dorsal coloring, orange dorsal coloration on the tail and an orange band around the neck. It is secretive and fast moving, mildly venomous, non-poisonous and characteristically curls its tail like a corkscrew when threatened. San Bernardino ring-neck snake occurs in moist habitats such as wet meadows, rocky hillsides, gardens, farmland, grassland, chaparral, mixed coniferous forests and woodlands, ranging from North central Oregon and southern Idaho, south through California and Nevada to Baja California, and east into Utah, Colorado, Arizona, New Mexico, and west Texas. San Bernardino ring-neck snake is a CDFW-designated Species of Special Concern.

Coast horned lizard

Coast horned lizard is a 6.3- to 11.4-centimeter-long (snout to vent) flat-bodied lizard featuring spines along its sides and back, and a large crown of spines on its head. Its coloration is reddish, brown, yellow, or gray, with dark blotches on the back and neck. The coast horned lizard occurs in open country, especially washes, flood plains and wind-blown deposits in valley-foothill hardwood, conifer and riparian habitats, pine-cypress, juniper and grassland habitats ranging from the Sierra Nevada foothills in Butte to Kern Counties and throughout the central and southern California coast to 1,800 meters in elevation. The coast horned lizard is a CDFW-designated Species of Special Concern, and has been observed within suitable habitat including open grassland, scrub and woodlands. This lizard relies on native harvester ants as a food source.

Coast patch-nosed snake

The coast patch-nosed snake is a 10- to 46-inch-long non-poisonous snake, whose occurrence ranges from the coastal region of San Luis Obispo County in California to the coasts of northern Baja California. This species is commonly found in semi-arid brush areas and chaparral in canyons, rocky hillsides, and plains. It is listed by the CDFW as a California Species of Special Concern, and has been observed in chaparral within the Southern Undeveloped Area and near Sage Ranch Park.

Two-striped garter snake

The two-striped garter snake is a 46- to 76-centimeter-long, dark-colored, non-poisonous snake with two pattern morphs: one with light grey or yellowish bilateral stripes and one without stripes but with faint spotting. This semi-aquatic snake occurs in streams, ponds and uplands in chaparral, oak woodland, and forest habitats ranging from Monterey County to northern Baja California as well as Catalina Island to 2,400 meters in elevation. The two-striped garter snake is a CDFW-designated Species of Special Concern, and has been observed specifically within seasonal ponds (e.g., Perimeter Pond), a former detention basin, a roadside, and a gravel-lined swale.

Special-Status Bird Species Descriptions

Cooper's hawk

Cooper's hawk is a crow-sized raptor with a long tail and short rounded wings. Adult coloration is slate-gray above and finely rust-barred below. Nests are stick platforms located in deciduous trees in crotches 6 to 15 meters above the ground or in conifers on horizontal branches often just below the lowest live limbs. Cooper's hawk is a breeding resident in wooded habitat throughout the state, using broken woodland and habitat edges for hunting, and dense stands with moderate crown-depths for nesting. Cooper's hawk is on the CDFW Watch List and has been observed within the woodland communities throughout the project site.

Sharp-shinned hawk

Sharp-shinned hawk is slightly smaller in size than a Cooper's hawk with a long, narrow, square-tipped tail and short rounded wings. Adult coloration is slate-gray above, pale below, with fine rust-colored barring. Nests are twig platforms concealed in large, closed-canopy forests, especially conifer forests. Breeding season habitat includes deciduous and evergreen forest throughout much of the United States. Sharp-shinned hawks winter coast to coast throughout the

southern United States and northern Mexico, ranging as far south as Panama. Sharp-shinned hawk is on the CDFW Watch List, and has been observed in the woodland habitats of the project site.

Southern California rufous-crowned sparrow

Southern California rufous-crowned sparrow is a 15-centimeter-long, grayish -brown sparrow with a dark reddish crown and rufous line extending posteriorly from eye. Nests are located anywhere from the ground at the base of rocks or trees and up to 1 meter in a tree or shrub. Southern California rufous-crowned sparrow is a resident of hillslopes in low, scattered scrub land or at the edges of tall chaparral in the Transverse and Coastal ranges through Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara, and Ventura Counties. Southern California rufous-crowned sparrow is on the CDFW Watch List, and has been observed within various natural habitats that occur throughout the project site.

Golden eagle

The golden eagle is large raptor measuring up to 102 centimeters in length with mostly brown plumage except for a golden wash on the back of the head and neck. It generally inhabits open and semi-open country such as prairies, sagebrush, tundra, savannah, sparse woodland, and barren areas. Nests are usually found on cliffs but sometimes in large trees, on steep hillsides, or on the ground. Golden eagle is a CDFW Fully Protected species. This species has been observed nesting within the Northern Undeveloped Area.

Great blue heron

The great blue heron is a tall, long-necked wading bird with a dull blue-gray body, a yellow bill, and a black streak running from behind the eye to the back of the head. It is the largest of the North American herons. Colonial nesting typically occurs high in trees in swamps and woodlands and to a lesser extent on the ground or in bushes. Habitat requires close access to water and may include freshwater and brackish marshes, along lakes, rivers, bays, lagoons, ocean beaches, mangroves, fields, and meadows. The great blue heron is a California Department of Forestry and Fire Protection (CDF) sensitive species, and is not expected to nest within the project site; however, it has been observed foraging around riparian and open water areas.

Bell's sage sparrow

Bell's sage sparrow can be found in the foothills of the northern California coastal ranges southward the coastal ranges of Baja California, as well as the western slope in the Sierra Nevada Mountains. This species lives in shrubland and chaparral dominated by chamise or California sagebrush. Bell's sage sparrow nests either on the ground or within shrubs, about three feet above ground-level. Bell's sage sparrow is on the USFWS Birds of Conservation Concern and the Audubon Society's Watch list.

Yellow warbler

The yellow warbler is widespread in North American during annual migrations. Within California, its current breeding range extends throughout the state, except in the Central Valley and Mohave Desert. Breeding elevation limits are approximately 2,100–2,600 meters. This species requires a proximity to water, and generally nests in riparian habitats, often within

willows and cottonwoods. The yellow warbler is listed as a California Species of Special Concern by CDFW. This species was observed in 2010 foraging along the Northern Drainage.

White-tailed kite

The white-tailed kite range is wide-spread in the western and southern portions of the United States. This species is commonly found in savanna, open woodlands, desert grasslands, meadows, and coastal and valley lowlands, usually near agricultural areas. This species prefers to nest in woodlands near marsh edges, while disturbed and grassland habitats offer optimum foraging habitat. The white-tailed kite is considered a Fully Protected species by the CDFW.

American peregrine falcon

The American peregrine falcon occurs throughout the United States. It can be found in much of California during winter and migration periods. The falcon's breeding range includes the southern and central coast of California. Nesting typically occurs on cliff faces, city buildings, and bridges. Habitats are varied and include coastal habitats, wetlands, woodlands, and agricultural areas. The American peregrine falcon is considered a Fully Protected species by CDFW.

Loggerhead shrike

The loggerhead shrike is a wide-ranging species that occupies open habitats including grassland, scrub, and open woodland communities. This species typically nests in densely vegetated, isolated trees and shrubs at the margins of open grasslands, and occasionally human-made structures. The shrike is a year-round resident in much of California, though it is generally absent from high altitudes in the Sierra Nevada Mountains and dense forests in the northwest part of the state. Loggerhead shrikes are highly territorial, with pairs maintaining territories during the breeding season and individuals maintaining territories during the winter. It is listed by the CDFW as a California Species of Special Concern.

Double-crested cormorant

The double-crested cormorant occurs in freshwater and marine habitats along coastlines throughout most of the United States. Although the range of the double-crested cormorant is large, the area in which breeding occurs is much more restricted to coastal areas. This species forages in both open water and shallow water and nests in sandbars, trees, or cliffs. The double-crested cormorant is listed as a California Species of Special Concern by the CDFW, and has been observed in open water habitats.

Least Bell's vireo

The least Bell's vireo's range extends from Baja California, Mexico, to the northern Sacramento Valley of California, and from the California coastal ranges east to Death Valley. Least Bell's vireos are obligate riparian breeders, nesting along stream courses typically dominated by willows (*Salix* spp.), cottonwoods (*Populus* spp.), oaks (*Quercus* spp.), and/or mule fat (*Baccharis salicifolia*). The key structural components of suitable breeding habitat are a dense layer of vegetation within 3 to 6 feet of the ground and canopy layer. Vireos spend the winter in southern Baja California, Mexico, and arrive on breeding grounds in California in March or April. The least Bell's vireo is a federally- and state-endangered species. Least bell's vireo was

not detected during protocol surveys conducted in 2011 and 2012 within Area II, Area IV, and Northern Undeveloped Area.

Special-Status Mammal Species Descriptions

Pallid bat

The pallid bat occurs throughout low elevation areas in California. This species occupies a wide variety of habitats including shrublands, woodlands, grasslands, and mixed conifer forests, but is most common in open, dry areas with rocky outcroppings for roosting. Crevices in cliff faces, caves, hollow trees, and buildings are the preferred roosting areas as well, and day roosts are generally in areas that remain cool. Foraging occurs in woodlands, coastal sage scrub, grasslands, and chaparral. The pallid bat is listed as a California Species of Special Concern by the CDFW. Based on the results of the acoustical surveys within Area I and Area III, it is highly likely this species occurs throughout the year and roosts, forms maternity colonies, and winters at the project site (Forde, 2014).

Townsend's big-eared bat

The Townsend's big eared bat occurs throughout California in a variety of habitats, including subalpine and alpine, desert scrub, sagebrush, chaparral, and deciduous and coniferous forests, where it feeds primarily on moths. Distribution of this cave-roosting species is strongly correlated with the availability of roosting habitat such as caves or cave-like structures including mines, tunnels, abandoned buildings, and bridges. One of the most important characteristics of suitable hibernation habitat is that it be free of human disturbance. Townsend's big-eared bat only roosts in the open, hanging from walls and ceilings, where it is relatively easily detected and particularly vulnerable to disturbance, as well as in basal hollows of very large trees. However, roosting sites are uncommon in California. Townsend's big-eared bat is listed as both a California Species of Special Concern and a candidate for listing as a state-threatened species by CDFW. Based on the results of the acoustical surveys within Area I and Area III, it is highly likely this species occurs throughout the year and roosts, forms maternity colonies, and winters at the project site (Forde, 2014).

California mastiff bat

The California mastiff bat, also known as western mastiff bat, is found throughout California. The California mastiff bat is a cliff-roosting species; suitable habitats for roosting include crevices in nearly vertical canyons or cliffs, tunnels, granite rock, and sandstone. Occasionally this species may be found roosting in trees and the rafters and awnings of buildings. Roosting areas need to be at least 6 feet from the ground to allow for adequate take-off; roosting sites located 12 feet or higher from the ground are most commonly observed. California mastiff bats forage in a variety of habitats including coastal scrub, desert scrub, chaparral, and coniferous and deciduous woodlands. The California mastiff bat is a CDFW-designated Species of Special Concern. Based on the results of the acoustical surveys within Area I and Area III, it is highly likely this species occurs throughout the year and roosts, forms maternity colonies, and winters at the project site (Forde, 2014).

Western red bat

The western red bat occurs throughout California with exception of the state's northeast corner. This species migrates between summer and winter ranges; its winter range includes western lowlands and coastal regions south of San Francisco Bay. The western red bat is a tree-roosting species and typically roosts along edge of forest habitats near open areas for foraging, as well as in orchards. The western red bat is a CDFW-designated Species of Special Concern. Based on the results of the acoustical surveys within Area I and Area III, this species utilizes the project site during spring migration; however, some individuals persist throughout the summer in small numbers. Potential roosting sites for this species include the oak woodland and riparian habitats within Southern Undeveloped Area and Area III (Forde, 2014).

Hoary bat

The hoary bat is the most widespread of all bats in the United States. The hoary bat is a tree-roosting species, and roosts in coniferous forests and woodland habitats near water sources. The hoary bat is not a special-status species; however, all individual bats and roosts are protected under Sections 1801-1802 and 2000-2021.5 of the California Fish and Game Code. The lack of detection of these species after May indicates that this species is likely a migrant (Forde, 2014).

California leaf-nosed bat

The California leaf-nosed bat occurs throughout California. This species is cave-roosting and is typically found in rock and cliff crevices, caves, mines, and occasionally buildings. Foraging occurs in woodlands coastal sage scrub, grasslands, and chaparral. The California leaf-nosed bat is a CDFW-designated Species of Special Concern and is listed as a high priority on the Western Bat Working Group List. Based on the results of the acoustical surveys within Area I and Area III, it is highly likely this species occurs throughout the year and roosts, forms maternity colonies, and winters at the project site (Forde, 2014).

Western small-footed myotis

The western small-footed myotis can be found throughout almost the entire western half of North America and southward into northern Mexico. This species occurs in a wide variety of habitats, but is primarily found in arid climates in woodlands and brushy uplands near water sources, where it can drink and forage. The elevation range extends to at least 2,700 meters. This species often roosts in crevices in rock and cliff faces, caves, and buildings--humid roosts are preferred. The western small-footed myotis has a CNDDB element ranking of S3, meaning it is vulnerable species in the state with relatively few populations. Based on the results of the acoustical surveys within Area I and Area III, it is highly likely this species occurs throughout the year and roosts, forms maternity colonies, and winters at the project site (Forde, 2014).

Yuma myotis

The Yuma myotis is prevalent throughout California. The Yuma myotis occurs in a wide variety of habitats from sea level up to 3,330, but is more common at elevations beneath 2,500 meters. Common habitats include riparian, scrub, and forest habitats. A freshwater source is essential for foraging and drinking. Roosting takes place in large groups in rock crevices, mines, caves, and, occasionally, abandoned swallow nests and beneath bridges. The Yuma myotis is not a special-status species; however, all individual bats and roosts are protected under Sections 1801–1802

and 2000–2021.5 of the California Fish and Game Code. Based on the results of the acoustical surveys within Area I and Area III, it is highly likely this species occurs throughout the year and roosts, forms maternity colonies, and winters at the project site (Forde, 2014).

Ringtail

The ringtail is located throughout California. The ringtail is found in a variety of habitats ranging from sea level to 2,900 meters, but is most common at 1,400 meters and below. Riparian and shrubby semi-arid habitats with rocky outcroppings or canyons are preferred, but this species is also found in arid regions, deserts, chaparral, woodlands, and forests. The ringtail is listed as a Fully Protected Species by the CDFW.

San Diego black-tailed jackrabbit

The San Diego black-tailed jackrabbit ranges from the Kern-Ventura County line southward into Baja California. This species prefers arid climates and occupies diverse habitats including chaparral, grasslands, agricultural areas, and areas with sparse vegetation; however, shrubs are required for cover. The San Diego black-tailed jackrabbit often nests in shallow depressions beneath shrubs. The CDFW lists this species as a California Species of Special Concern.

Bobcat

The bobcat ranges from southern Canada to southern Mexico, and can be found in a wide range of habitats throughout the contiguous 48 states. The bobcat can live in a variety of habitats including forest, coastal swamp, scrubland, and chaparral and prefers low to mid elevations. This species dens in thick brush, hollow logs and trees, and rock crevices and requires thick cover for hunting and travelling. Territorial ranges of this solitary species vary from 8 to 20 squares miles. This species is protected by the California Fish and Game Code Sections 2000–2021.5.

San Diego desert woodrat

The San Diego desert woodrat can be found just south of San Luis Obispo County to northwestern Baja California. This species can live in a wide range of habitats, but often occurs in rock outcrops, sagebrush scrub and chaparral. The San Diego desert woodrat is listed as a California Species of Special Concern by CDFW.

Mule deer

The mule deer lives throughout the western North America, from Alaska down to Baja California and east to the Great Plains. Mule deer are typically found in more open habitats, such as grasslands, but are also found in scrub, woodlands and forest habitats. The majority of its diet is comprised of sagebrush; however, their diet is comprised of a large variety of plants. This species is protected by the California Fish and Game Code Sections 2000-2021.5.

Los Angeles little pocket mouse

The Los Angeles little pocket mouse is found within the Los Angeles basin, but is mostly confined to the areas of east Riverside County including Cabazon, San Jacinto, Aguanga, and Temecula. This species' habitat includes lower elevation grassland, alluvial sage scrub, and coastal sage scrub with elevation ranges from 160 meters to 800 meters. The Los Angeles little pocket mouse is listed by the CDFW as a California Species of Special Concern.

Jurisdictional Wetlands and Waters

Jurisdictional waters typically include rivers, streams, creeks, ponds, and lakes. Jurisdictional wetlands are typically areas that are inundated or saturated either periodically or permanently, and often include features such as marshes, mudflats, swamps, and vernal pools. There are two primary streams that drain the project site: the Northern Drainage, which flows in a westerly direction into Meier Canyon, Arroyo Simi, Calleguas Creek, and eventually into the Pacific Ocean; and the Southwestern Drainage (also known as Bell Creek), which flows into the Los Angeles River and terminates at the Pacific Ocean. A total of 17 sub-watersheds are present within the project site; multiple ephemeral drainages and surface water monitoring outfalls exist which are tributaries to the Northern and Southwestern Drainages. Ephemeral streams generally occur within highly fractured breaks between uplifted and eroded rock formations. These drainage features are included in the table below and have been identified as potential jurisdictional features in **Figure 4.3-6**.

No naturally permanent (i.e., perennial) wet areas are present within the proposed remediation areas, and runoff is typically rapid and all streams are generally dry during summer (i.e., ephemeral). However, Silvernale Pond does contain open water for much of the year due to discharges of treated groundwater. During the winter months, three other man-made basins within the proposed remediation areas (Perimeter Pond, R-1 Pond, and the Sedimentation Basin at the Lower Lot Biofilter near the entrance to the project site) support ponding water when sufficient rainfall has occurred. Small, isolated wetlands may occur in areas where seeps exist or runoff accumulates.

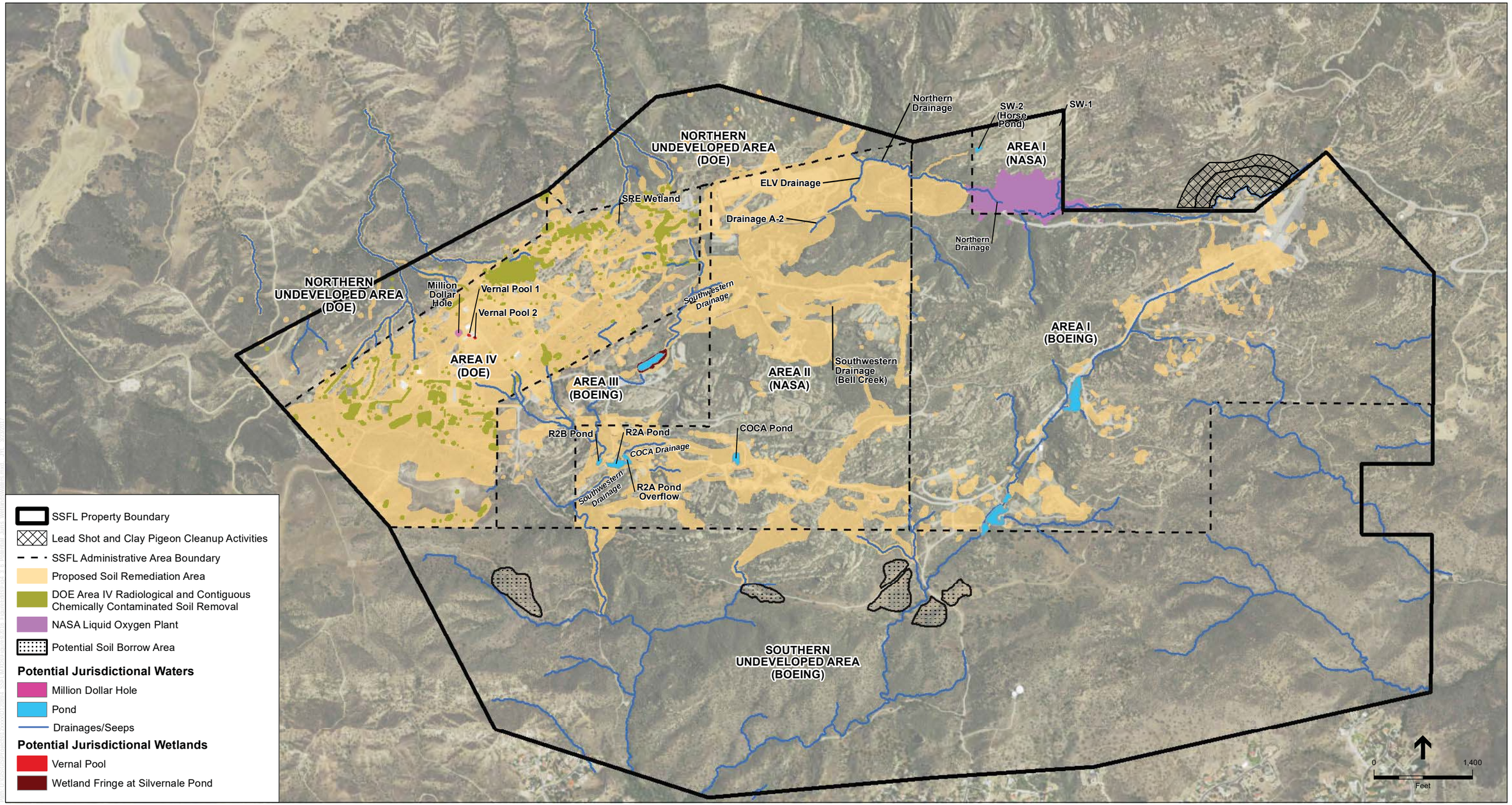
Table 4.3-5 identifies several water features that may be determined to be jurisdictional by the USACE, LARWQCB, and/or CDFW. The USACE has provided an approved jurisdictional determination for riverine features and wetlands that are confirmed waters of the United States located in NASA areas. These features are shown in Figure 4.3-6 and include constructed ponds and natural channels, including the Northern and Southwestern Drainages.

Based on numerous field surveys at the project site by Padre Associates, potential waters of the United States and state-regulated waters are located within the proposed remediation areas. As indicated in Table 4.3-5, this includes the Northern Drainage including Outfall 009, R- 1 Pond, Perimeter Pond (and the ephemeral drainage feeding into it from the north), Silvernale Pond (and the ephemeral drainage that feeds into it, immediately west of SPA), 17th Street Drainage (an ephemeral tributary to Bell Canyon from Hydrogen Lab downstream to Compound A), the Southern Undeveloped Area Seeps in Bell Canyon, and the Southern Undeveloped Area eastern property boundary in Dayton Canyon. Water features potentially subject to USACE and LARWQCB jurisdiction may total up to 5.62 acres. USACE-defined wetlands are likely present within or adjacent to several of the potentially jurisdictional features, including at R-1 Pond, Silvernale Pond, and the seeps in Bell Canyon.

TABLE 4.3-5
POTENTIALLY JURISDICTIONAL WETLANDS AND WATERS WITHIN SSFL SUBJECT TO CLEAN WATER ACT

Feature ID	Total Potential Waters of the U.S./State (Linear Feet [LF])
Area I (Boeing), Area III, and Southern Undeveloped Area	
Palustrine Wetlands	
R-1 Pond[1]	1.06
Perimeter Pond	0.73
Silvernale Pond[1]	1.83
Total Palustrine Wetlands	***3.62***
Riverine	
Drainages/seeps	13.38 (56,928 LF)
Total Riverine Wetlands	***13.38 (56,928 LF)***
Total Potential Waters of the U.S./State in Area I (Boeing), Area III, and Southern Undeveloped Area	17.00 (56,928 LF)
Area I (NASA) and Area II	
Palustrine Wetlands	
R2A Pond	0.74
R2B Pond	0.13
Coca Skim Pond	0.33
SW-1 Pond	0.003
SW-2 Pond (Horse Pond)	0.15
Total Palustrine Wetlands	***1.35***
Riverine[2]	
Northern Drainage	0.46 (2,176 LF)
ELV Drainage	0.14 (862 LF)
Southwestern Drainage (Bell Creek)	0.43 (8,420 LF)
Coca Drainage	0.20 (655 LF)
Drainage A-2	0.03 (324 LF)
Total Riverine Wetlands	**1.26 (12,437 LF)**
Total Potential Waters of the U.S./State in Area I (NASA) and Area II	2.61 (12,337 LF)
Area IV and NORTHERN UNDEVELOPED AREA	
Palustrine Wetlands	
SRE Pond (Outfall 4)	0.02
Vernal Pool 1[3]	0.02
Vernal Pool 2[3]	0.01
Million Dollar Hole	0.18
Total Palustrine Wetlands	***0.23***
Riverine	
Ephemeral Drainages	0.63 (13,100 LF)
Total Riverine Wetlands	**0.63 (13,100 LF)**
Total Potential Waters of the U.S./State in Area IV and Northern Undeveloped Area	0.86 (13,100 LF)
TOTAL Potential Waters of the U.S./State in SSFL	20.47 (82,365 LF)

1 Wetlands may be present within or adjacent to these features.
2 Only natural wetlands are included.
3 Vernal pools mapped within DOE areas are not likely considered waters of the U.S., but meet the state (CDFW) and County's definitions of wetlands.
Sources: Padre, 2013; NASA, 2012; DOE, 2014.



SOURCE: Parus; NASA; DOE; Boeing; ESA

Santa Susana Field Laboratory.120894

Figure 4.3-6

Potential Jurisdictional Wetlands and Waters

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Features present within Area I, Area III, and Southern Undeveloped Area that may be subject to CDFW jurisdiction pursuant to Section 1602 of the California Fish and Game Code include ponds, streams, and riparian woodland. The ponds and streambeds indicated in Table 4.3-5 as potentially subject to USACE and LARWQCB jurisdiction are also potentially subject to CDFW jurisdiction. In addition, the riparian communities within Area I, Area III, and Southern Undeveloped Area that include southern coast live oak riparian forest, mulefat scrub, southern willow scrub, and (portions of) coast live oak woodland, would also be subject to CDFW jurisdiction. Based on visual indicators of the typical extent of riparian vegetation at these locations during surveys conducted by Padre Associates, Inc., the average estimated width of most of the riparian canopies is approximately 25 feet (Padre, 2013).

Some areas within the proposed remediation areas likely exhibit evidence of seasonal saturation and may support vegetation requiring saturated conditions (facultative or obligate plants) for at least a portion of their life cycle. Therefore, CDFW-defined and/or County-defined wetlands are likely present within or adjacent to R-1 Pond, Silvernale Pond, and the Seeps in Bell Canyon.

As indicated by the results of the January 2012 wetland delineation (NASA, 2012) and the USACE jurisdictional determination (USACE, 2013), a total of 2.46 acres of wetlands are within the Area I (NASA) and Area II consisting of 1.20 acres of palustrine (ponded) wetlands and 1.26 acres of riverine (stream-like) wetlands. There is also 0.59 acre of constructed features that include swales, asphalt drainage ditches, and culverts; however, because these features are fabricated, and therefore not jurisdictional wetlands, they are omitted from further analysis.

Three ponds and five drainages comprise the palustrine wetlands and river wetlands, respectively, within the Area I (NASA) and Area II. The largest drainages are the Northern Drainage, in the southern portion of Area I and northeastern portion of Area II; the Southwestern Drainage, in the central portion of Area II; and Coca Drainage, in the south-central portion of Area II. Table 4-3-5 provides a summary of these wetland features, and Figure 4.3-6 depicts the locations of these features within the Area I (NASA) and Area II.

USACE jurisdictional waters within the Area I (NASA) and Area II include extant natural drainages, some of which have been realigned and lined with concrete. Furthermore, the R2A, R2B, and Coca ponds have been created along the natural drainage channels and are considered either impoundments of waters of the U.S. or adjacent to waters of the U.S., and thus jurisdictional.

In addition, there are features present that may be subject to CDFW jurisdiction within Area I (NASA) and Area II that include the ponds, streams, associated riparian habitat, and some manmade features. The ponds and streambeds of the features identified in Table 4.3-5 as subject to USACE and LARWQCB jurisdiction are also potentially subject to CDFW jurisdiction. In addition, the riparian communities within Area I (NASA) and Area II (southern coast live oak riparian forest, mulefat scrub, southern willow scrub and portions of coast live oak woodland) would also be subject to CDFW jurisdiction. CDFW-defined wetlands and/or County-defined wetlands are present within or adjacent to several of the features listed above.

A formal jurisdictional delineation of waters of the U.S. was conducted within Area IV and Northern Undeveloped Area by Leidos on May 6, 7, and 8, 2014. Because the project site is at the headwaters of the ephemeral drainages located on the site, and because of the semi-arid environment, water is scarce and few wetlands exist. The known wetlands that have been delineated are man-made impoundments and include the small impoundment below Outfall 4 (also known as the SRE pond) and the man-made depression that was excavated to the northwest of Outfall 7. A total of 0.23 acre of palustrine (ponded) wetlands are located within Area IV.

There are no perennial streams or naturally occurring permanent water bodies within the project site (USEPA, 2009). The waters of the U.S. that have been delineated consist of ephemeral natural stream channels. Stormwater runoff from the developed areas within upland areas are currently diverted at stormwater treatment outfalls and routed for treatment before being released into Bell Canyon. Before the development of these outfalls, runoff from the northern portion of Area IV drained to Meier Canyon, which converges with the Arroyo Simi. The Arroyo Simi terminates into the Pacific Ocean at Mugu Lagoon; therefore, it is considered a water of the U.S. A total of 13,100 linear feet covering 0.62 acre of riverine waters of the U.S. have been delineated in Area IV and the Northern Undeveloped Area.

Water features present within Area IV and the Northern Undeveloped Area that are indicated in Table 4.3-5 would be subject to CDFW jurisdiction. In addition, the riparian communities within Area IV and the Northern Undeveloped Area (riparian scrub, mulefat scrub, and portions of coast live oak woodland,) would also be subject to CDFW jurisdiction. CDFW-defined wetlands and/or County-defined wetlands are present within or adjacent to several of the features listed above.

Critical Habitat

USFWS-designated critical habitat for Braunton's milk-vetch occurs within the southern portion of Area IV and includes a total of 56.16 acres. Braunton's milk-vetch critical habitat also occurs in the southeastern and northwestern corners of the Southern Undeveloped Area, which totals 10.80 acres. A small portion (0.57 acre) of USFWS-designated critical habitat for California red-legged frog exists within the southwestern corner of Area IV. Critical habitat for Braunton's milk-vetch and California red-legged frog are shown in Figure 4.3-4 and Figure 4.3-5c, respectively. No other federally designated critical habitat occurs within or adjacent to the project site. The next closest critical habitat is designated for Braunton's milk-vetch, which occurs approximately 1.3 miles west of the project site.

4.3.1.6 Noxious and Invasive Weeds

A *noxious weed* is a plant that has been defined as a "pest plant" by the U.S. Department of Agriculture or the California Department of Food and Agriculture (CDFA) (CDFA, 2011). *Invasive weeds*, as defined by the CNPS, are species that present an economic or ecological threat, but are not subject to legal regulations. Numerous noxious and invasive weed species were identified on the project site, six of which are classified by CDFA as noxious weeds. NASA areas were evaluated for the presence of noxious weeds in 2011 (NASA, 2014a).

A large portion of the project site, including the Northern Undeveloped Area, is recovering from a wildland fire that burned through the property in September 2005. A 2009 survey (SAIC, 2009a) noted that the Northern Undeveloped Area and much of the southwestern part of the project site was undisturbed and therefore was relatively free of invasive species. However, the previously developed portions of the site and nearby areas had a higher concentration of invasive species than other portions of the site (SAIC, 2009b; 2010). Currently, areas where woody vegetation is reestablishing after the 2005 wildland fire and subsequent mowing and other mechanical vegetation reduction measures (2010 through 2014) are more vulnerable to invasion than they would otherwise be because of the relative openness of the vegetation compared to pre-fire conditions (DOE, 2014).

Table 4.3-6 lists the noxious and invasive weeds that were reported during various biological surveys; however, other noxious and invasive weeds could be present as well.

4.3.2 Regulatory Setting

4.3.2.1 Federal

Federal Endangered Species Act

The FESA and implementing regulations, Title 16 United States Code (USC) Section 1531 et seq. (16 USC 1531 et seq.), Title 50 CFR Section 17.1 et seq. (50 CFR Section 17.1 et seq.), includes provisions for the protection and management of federally listed threatened or endangered plants and animals and their designated critical habitats. Species listed as endangered, threatened, or candidate (proposed for listing) by the USFWS or NMFS under the ESA are protected under Section 9 of the ESA, which forbids any person to "take" individuals of an endangered or threatened species. "Take" is defined in ESA Section 3 as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." The term "harm" includes destruction or modification of habitat. ESA Sections 7 and 10 authorize "incidental take" for an otherwise lawful activity if it is determined that the activity would not jeopardize the species' survival or recovery. Under Section 7, federal agencies are to consult with the USFWS or NMFS, as applicable, if their federal actions affect a federally-listed species or result in the destruction or adverse modification of designated critical habitat. Section 10 applies when a federally listed species is present but no federal nexus is present. The general take prohibition and Section 7 take authorization process are relevant to the project because the project site is known to support federally-listed species and their habitats. Implementation of the project may adversely affect the federally-listed species Braunton's milk-vetch and its designated critical habitat. As such, formal consultation with USFWS is required. Because no impacts are anticipated to NMFS-regulated species, consultation is not required with this agency.

TABLE 4.3-6
NOXIOUS AND INVASIVE WEEDS IDENTIFIED WITHIN SSFL

				Responsible Party		
Scientific Name	**Common Name**	**Type**	**Threat**	**Boeing**	**NASA**	**DOE**
Ailanthus altissima	Tree of heaven	Noxious	Moderate	X	X	X
Brassica nigra	Black mustard	Invasive	Moderate	X	X	
Bromus diandrus	Ripgut brome	Invasive	Moderate	X	X	X
Avena barbata	Slender wild oats	Invasive	Moderate	X		
Avena fatua	Wild oats	Invasive	Moderate	X		
Brassica nigra	Black mustard	Invasive	Moderate	X		
Bromus madritensis ssp. rubens	Red brome	Invasive	High	X	X	X
Carduus pycnocephalus	Italian plumeless thistle	Noxious	Moderate	X	X	X
Carpobrotus edulis	Hottentot Fig	Invasive	Moderate	X		
Centaurea calcitrapa	Purple star-thistle	Invasive	Moderate	X		X
Centaurea melitensis	Maltese star-thistle	Noxious	Moderate	X	X	X
Centaurea solstitialis	Yellow star-thistle	Invasive	High			X
Cirsium vulgare	Bull thistle	Noxious	Moderate	X	X	
Cortaderia selloana	Pampas grass	Invasive	High	X		
Cynodon dactylon	Bermudagrass	Invasive	Moderate	X	X	
Dittrichia graveolens	Stinkwort	Invasive	Moderate	X		
Eucalyptus globulus	Blue gum	Invasive	Moderate	X		
Festuca arundinacea	Tall fescue	Invasive	Moderate	X		
Festuca (Vulpia) myuros	Rat-tail fescue	Invasive	Moderate	X	X	
Foeniculum vulgare	Sweet fennel	Invasive	High		X	
Gazania linearis	Treasureflower	Invasive	Moderate		X	
Hirschfeldia incana	Short-pod mustard	Invasive	Moderate	X		X
Hordeum marinum	Barley	Invasive	Moderate			
Mesembryanthemum crystallinum	Common iceplant	Invasive	Moderate		X	
Nicotiana glauca	Tree tobacco	Invasive	Moderate	X		X
Pennisetum setaceum	Crimson fountaingrass	Invasive	Moderate	X	X	X
Salsola tragus	Prickly Russian thistle	Noxious	Limited	X	X	
Sisymbrium irio	London rocket	Invasive	Moderate	X		
Tamarix ramosissima	Branched saltcedar	Noxious	High	X		
Trifolium hirtum	Rose clover	Invasive	Moderate	X		
Washingtonia robusta	Mexican fan palm	Invasive	Moderate	X		

SOURCES: CDFA, 2011; Cal-IPC, 2012; NASA, 2014.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (U.S. Code Title 16 Section 703–711), first enacted in 1918, domestically implements a series of treaties between the United States and Great Britain (on behalf of Canada), Mexico, Japan, and the former Soviet Union that provide for international migratory bird protection. The MBTA prohibits, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird…" The MBTA protects over 800 species, including geese, ducks, shorebirds, raptors, songbirds, and many relatively common species. Permits for take of nongame migratory birds can be issued only for specific activities, such as scientific collecting, rehabilitation, propagation, education, taxidermy, and protection of human health and safety and personal property.

Section 404 Clean Water Act

Section 404 of the Clean Water Act (CWA) (33 USC 1251 et seq., 33 CFR Sections 320 and 323) gives the USACE authority to dredge or fill material into waters of the U.S., including wetlands. The USACE (Federal Register 1982) and USEPA (Federal Register 1980) jointly define wetlands as: "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Wetlands have the following general diagnostic environmental characteristics: hydrophytic vegetation, hydric soils, and wetland hydrology (Environmental Laboratory 1987). Examples of wetlands may include freshwater marsh, seasonal wetlands, and vernal pool complexes that are adjacent to perennial waters of the U.S.

"Other waters of the U.S." refers to those hydric features that are regulated by the CWA but are not defined as wetlands (33 CFR 328.4). Examples of other waters of the U.S. may include rivers, creeks, ponds, and lakes. Swales are typically not considered waters of the U.S.

4.3.2.2 State

CEQA Guidelines, Section 15380

Although threatened and endangered species are protected by specific federal and state statutes, CEQA Guidelines Section 15380(b) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria as follows:

15380 (b) A species of animal or plant is:

1) "Endangered" when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors: or
2) "Rare" when either:
    a. Although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or

b. The species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered "threatened" as that term is used in the Federal Endangered Species Act.

Section 401 Clean Water Act

Under Section 401 of the CWA, the LARWQCB must certify that actions receiving authorization under Section 404 of the CWA also meet state water quality standards. The LARWQCB also regulates waters of the state under the Porter-Cologne Water Quality Control Act (Porter Cologne Act). The LARWQCB requires projects to avoid impacts to wetlands if feasible and requires that projects do not result in a net loss of wetland acreage or a net loss of wetland function and values. The LARWQCB typically requires compensatory mitigation for impacts to wetlands and/or waters of the state. The LARWQCB also has jurisdiction over waters deemed 'isolated' or not subject to Section 404 jurisdiction under the SWANCC decision. Dredging, filling, or excavation of isolated waters constitutes a discharge of waste to waters of the state and prospective dischargers are required obtain authorization through an Order of Waste Discharge or waiver thereof from the LARWQCB and comply with other requirements of Porter-Cologne Act.

Porter-Cologne Water Quality Control Act

Under the Porter-Cologne Water Quality Control Act, waters of the state fall under the jurisdiction of the appropriate RWQCB. Under the act, the LARWQCB must prepare and periodically update water quality control basin plans. Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control nonpoint and point sources of pollution to achieve and maintain these standards. Projects that affect wetlands or waters must meet waste discharge requirements of the LARWQCB, which may be issued in addition to a water quality certification or waiver under Section 401 of the CWA.

California Fish and Game Code

California Department of Fish and Wildlife Streambed Alteration Agreement Program

CDFW regulates activities that would interfere with the natural flow of, or substantially alter, the channel, bed, or bank of a lake, river, or stream. These activities are regulated under the California Fish and Game Code Sections 1600-1616. Requirements to protect the integrity of biological resources and water quality are often conditions of streambed alteration agreements. Requirements may include avoidance or minimization of the use of heavy equipment, limitations on work periods to avoid impacts on wildlife and fisheries resources, and measures to restore degraded sites or compensate for permanent habitat losses.

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources are subject to regulation by CDFW under Section 1602 of the California Fish and Game Code. A stream is defined as a body of water that flows at least periodically or intermittently through a bed or channel that has banks and supports fish or other aquatic life. This definition includes watercourses with a surface or subsurface flow that supports or has supported riparian vegetation. CDFW's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife. A CDFW streambed alteration agreement must be obtained for any project that would result in an

impact on a river, stream, or lake, or associated riparian or wetland habitat. As defined by the California Fish and Game Code, "wetlands" means lands which may be covered periodically or permanently with shallow water and which include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, fens, and vernal pools (California Fish and Game Code Section 2785).

Protection of Wildlife Species and Populations

Sections 1801-1802 of the California Fish and Game Code state that CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species, and it is state policy to maintain sufficient populations of all species of wildlife and the habitat necessary to achieve the objectives stated in the subdivisions identified in this code.

Sections 2000-2021.5 of the California Fish and Game Code state that it is unlawful to take or possess any bird, mammal, fish, reptile, amphibian, or parts thereof, except as provided in this code or regulations made under it.

California Endangered Species Act

CESA and implementing regulations in the Fish and Game Code, Section 2050 through Section 2089, include provisions for the protection and management of plant and animal species listed as endangered or threatened, or designated as candidates for such listing. Incidental take of an endangered species is permitted by CDFW only under certain conditions and provided that the proper federal permits have been obtained and notifications made to the CDFW. Pursuant to Section 2081 of the Code, the CDFW may authorize individuals or public agencies to import, export, take, or possess, any state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or Memoranda of Understanding if: (1) the take is incidental to an otherwise lawful activity; (2) impacts of the authorized take are minimized and fully mitigated; (3) the permit is consistent with any regulations adopted pursuant to any recovery plan for the species; and (4) the applicant ensures adequate funding to implement the measures required by CDFW. The CDFW makes this determination based on available scientific information and considers the ability of the species to survive and reproduce.

Protection of Birds, Nests, and Eggs

Section 3503 of the California Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 specifically states that it is unlawful to take, possess, or destroy any raptors (i.e., species in the orders *Falconiformes* and *Strigiformes*), including its nests or eggs. Typical violations of these codes include destruction of active nests resulting from removal of vegetation in which the nests are located. Violation of Section 3503.5 also includes failure of active raptor nests resulting from disturbance of nesting pairs by nearby project construction. This statute does not provide for the issuance of any type of incidental take permit.

Section 3800 of the California Fish and Game Code affords protection to all nongame birds, which are all birds occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds. Section 3513 of the California Fish and Game Code upholds the MBTA by prohibiting any take or possession of birds that are designated by the MBTA as migratory nongame birds except as allowed by federal rules and regulations promulgated pursuant to the MBTA.

California Fully Protected Species

California fully protected species are described in Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code. These statutes prohibit take or possession of fully protected species. CDFW is unable to authorize incidental take of fully protected species when activities are proposed in areas inhabited by those species.

Native Plant Protection Act (California Fish and Game Code Sections 1900 through 1913)

The Native Plant Protection Act (NPPA) was enacted in 1977 and allows the Fish and Game Commission to designate plants as rare or endangered. There are 64 species, subspecies, and varieties of plants that are protected as rare under the NPPA, including those listed as endangered, threatened or candidate species under the CESA. The NPPA prohibits take of endangered or rare native plants, but includes some exceptions for agricultural and nursery operations; emergencies; and after properly notifying CDFW for vegetation removal from canals, roads, and other sites, changes in land use, and in certain other situations. The NPPA gave the California Fish and Game Commission the authority to require permits and full mitigation for collecting, transporting, or selling such plants as long as it does not jeopardize the continued survival of the native plant.

4.3.2.3 Local

Ventura County Tree Protection Ordinance

Selected trees are protected by the Ventura County Tree Protection Ordinance, found in Section 8107-25 of the Ventura County Non-Coastal Zoning Ordinance (Division 8, Chapter 1, Section 8107-25). The ordinance protects selected native, heritage, or historical trees through regulation of the following activities: tree removal, trimming, or grading/excavating within the root zone, as identified in **Table 4.3-7**. Oak woodlands are additionally protected as "locally important communities," as discussed below.

The ordinance allows removal of five protected trees (only three of which can be oaks or sycamores; none of which can be heritage or historical trees) through a ministerial permit process. Removal of beyond this may trigger a discretionary tree permit. If a project cannot avoid impacts to protected trees, mitigation of these impacts (such as replacement of lost trees) is addressed through the tree permit process—unless the impacts may affect biological resources beyond the tree itself, such as to sensitive status species that may be using the tree, nesting birds, the tree's role as part of a larger habitat, etc. These secondary impacts have not been addressed through the tree permit program and must be addressed by the biologist in accordance with CEQA.

TABLE 4.3-7
PROTECTED TREES IN VENTURA COUNTY[1]

Common Name/Botanical Name (Genus/Species)	Girth Standard (Circumference)
Oak (Single) (*Quercus* all species)	9.5 in.
Oak (Multi) (*Quercus* all species)	9.5 in.
Sycamore (*Platanus* all species)	9.5 in.
Historical Tree[2] (any species)	(any size)
Heritage Tree[3] (any species)	90.0 in.

1 Tree species protected within the Scenic Resource Protection Overlay Zone are excluded from the table, as it does not apply to the project site.

2 Any tree or group of trees identified by the County or a city as a landmark, or identified on the Federal or California Historic Resources Inventory to be of historical or cultural significance, or identified as contributing to a site or structure of historical or cultural significance.

3 Any species of tree with a single trunk of 90 or more inches in girth or with multiple trunks, two of which collectively measure 72 inches in girth or more. Species with naturally thin trunks when full grown or naturally large trunks at an early age, or trees with unnaturally enlarged trunks due to injury or disease must be at least 60 feet tall or 75 years old.

SOURCE: Ventura County Tree Protection Ordinance (Sec. 8107-25 and Subsections added by ORD. 3993 – 2/25/92).

A tree permit does not, however, substitute as mitigation for impacts to oak woodlands. If a project results in a loss of oak woodland, acceptable mitigation measures include, but are not limited to, habitat restoration and conservation of other oak woodlands through the use of conservation easements and planting replacement trees (which must be maintained for seven years).

Ventura County Oak Woodlands Management Plan

The Ventura County Oak Woodlands Management Plan (2007) was prepared pursuant to guidelines and goals articulated in the California Oak Woodlands Conservation Program, enacted by Chapter 588, Statutes of 2001. The County's overall goal is to preserve and protect oak woodlands as an important County and State resource by:

1. Encouraging private landowners and conservation organizations to protect oak woodlands,
2. Ensuring consistent consideration of oak woodlands during discretionary permit review,
3. Considering appropriate amendments to the County's regulatory plans and ordinances, as funding permits, and
4. Support countywide biological data collection, analysis, and mapping.

Ventura County General Plan

The Resources Element includes goals and policies that have been developed to minimize potential impacts to biological resources, including Locally Important Species.

Biological Resources Goals

1.5.1: Preserve and protect significant biological resources in Ventura County from incompatible land uses and development. Significant biological resources include endangered, threatened, or rare species and their habitats, wetland habitats, coastal habitats, wildlife migration corridors and locally important species/communities.

Biological Resources Policies

1.5.2.1: Discretionary development which could potentially impact biological resources shall be evaluated by a qualified biologist to assess impacts and, if necessary, develop mitigation measures.

1.5.2.2: Discretionary development shall be sited and designed to incorporate all feasible measures to mitigate any significant impacts to biological resources. If the impacts cannot be reduced to a less than significant level, findings of overriding considerations must be made by the decision-making body.

1.5.2.3: Discretionary development that is proposed to be located within 300 feet of a marsh, small wash, intermittent lake, intermittent stream, spring, or perennial stream (as identified on the latest USGS 7½ minute quad map), shall be evaluated by a County-approved biologist for potential impacts on wetland habitats. Discretionary development that would have a significant impact on significant wetland habitats[3] shall be prohibited, unless mitigation measures are adopted that would reduce the impact to a less than significant level; or for lands designated "Urban" or "Existing Community", a statement of overriding considerations is adopted by the decision-making body.

1.5.2.4: Discretionary development shall be sited a minimum of 100 feet from significant wetland habitats to mitigate the potential impacts on said habitats. Buffer areas may be increased or decreased upon evaluation and recommendation by a qualified biologist and approval by the decision-making body. Factors to be used in determining adjustment of the 100-foot buffer include soil type, slope stability, drainage patterns, presence or absence of endangered, threatened or rare plants or animals, and compatibility of the proposed development with the wildlife use of the wetland habitat area. The requirement of a buffer (setback) shall not preclude the use of replacement as a mitigation when there is no other feasible alternative to allowing a permitted use, and if the replacement results in no net loss of wetland habitat. Such replacement shall be "in kind" (i.e. same type and acreage), and provide wetland habitat of comparable biological value. Onsite replacement shall be preferred wherever possible. The replacement plan shall be developed in consultation with California Department of Fish and Game.

1.5.2.5: The California Department of Fish and Game, the U.S. Fish and Wildlife Service, National Audubon Society and the California Native Plant Society shall be consulted when discretionary development may affect significant biological resources. The National Park Service shall also be consulted regarding discretionary development within the Santa Monica Mountains or Oak Park Area.

1.5.2.6: Based on the review and recommendation of a qualified biologist, the design of road and floodplain improvements shall incorporate all feasible measures to accommodate wildlife passage.

[3] The County of Ventura defines wetlands as lands that are transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is periodically covered with shallow water. The frequency of occurrence of water is sufficient to support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands include marshes, bogs, sloughs, vernal pools, wet meadows, river and stream overflows, mudflats, ponds, springs and seeps (County of Ventura, 2013).

4.3.3 Thresholds of Significance

For the purposes of this PEIR, DTSC has utilized the checklist questions in Appendix G of the CEQA Guidelines as thresholds of significance to determine whether the project would have a significant environmental impact regarding biological resources. In addition, Ventura County's Initial Study Assessment Guidelines have been incorporated, as appropriate, into the analysis.

Would the project:

4.3-1 Have a substantial adverse effect either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS (refer to Impact Statements 4.3-1a, 4.3-1b, 4.3-2a, and 4.3-2b?

4.3-2 Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS (refer to Impact Statements 4.3-3a and 4.3-3b)?

4.3-3 Have a substantial adverse effect on federally protected wetlands and waters as defined by Section 404 of the Clean Water Act; or state protected wetlands and waters as defined by Section 401 of the Clean Water Act, Porter Cologne Water Quality Control Act, or Section 1602 of the California Fish and Game Code; through direct removal, filling, hydrological interruption, or other means (refer to Impact Statements 4.3-4a and 4.3-4b)?

4.3-4 Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites (refer to Impact Statements 4.3-5a and 4.3-5b)?

4.3-5 Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (refer to Impact Statements 4.3-6a and 4.3-6b)?

4.3-6 Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan (refer to Impact Statement 4.3-7)?

The following types of impacts to plant and animal species or their habitats are considered by the Ventura County Planning Department to be potentially significant:

- Loss of one or more individuals, occupied habitat or critical habitat designated by the USFWS of a species officially listed as Endangered, Threatened or Rare under the federal ESA (Title 50, Code of Federal Regulations Sections 17.11 or 17.12) or California Endangered Species Act (Sections 670.2 or 670.5, Title 14, California Code of Regulations [CCR]), Candidate, or California Fully Protected (refer to Impact Statements 4.3-1a and 4.3-1b). Impacts that would eliminate or threaten to eliminate one or more element occurrences of a special-status species not otherwise listed under the federal ESA

or CESA, or as a Candidate Species or California Fully Protected Species (i.e., Locally Important Species) (refer to Impact Statements 4.3-1a and 4.3-1b).

4.3.4 Methodology

Potential adverse impacts on species and natural communities were evaluated according to the likelihood of occurrence while taking into account the biology and/or life history of each resource potentially impacted by the project. Direct impacts from construction of the proposed project were evaluated for the effects from the loss of habitat on biological resources, including special-status species, as well as direct species impacts (i.e., mortality). The indirect impacts from construction or maintenance requirements of the proposed project were also evaluated to determine their long-term effects to species and habitats that may be affected.

4.3.5 Analysis of Project Impacts

The following text describes the potential environmental impacts related to biological resources associated with implementing the overall site cleanup and initial project activities, demarcated as impact "a" and "b" respectively. As presented in Section 3.7, *Initial Activities*, these activities include eight different projects. Depending on the degree to which impacts of the initial activities would be similar to or different from each other, the impact analysis for some thresholds have been combined accordingly (i.e., the number of separate discussions for impact for each threshold ranges from one to eight). Each impact discussion concludes with a significance determination.

4.3.5.1 Braunton's Milk-Vetch

Program Assessment

Impact 4.3-1a: Would implementation of the **overall site cleanup** have a substantial adverse effect either directly or through habitat modification on Braunton's milk-vetch or its designated critical habitat?

Overall Site Cleanup (Impact 4.3-1a)

As depicted in Figure 4.3-4, Braunton's milk-vetch populations have been documented within northern mixed chaparral located in the vicinity of the USFWS-designated critical habitat for Braunton's milk-vetch, in the western portion of Area IV. No other Braunton's milk-vetch populations or individual plants have been documented within the overall site cleanup areas; however, not all areas containing suitable habitat for this species have been recently surveyed; therefore, this species would potentially be present within suitable habitat elsewhere within the project site including dormant seed banks within undisturbed or areas that have not been recently burned. As shown in Figure 3-6, designated critical habitat for Braunton's milk-vetch within the project site and an area adjacent to designated critical habitat that is occupied by Braunton's milk-vetch has been identified as potential AOC exception areas.[4] The Section 7 informal consultation process is ongoing at this time, and therefore, a Biological Opinion (BO) has not been issued by

[4] AOC exceptions are described further in Section 3.3.1, *Soil*, of this PEIR.

USFWS. The USFWS, through the BO, makes a determination on whether the project would result in jeopardy,[5] and if a jeopardy determination is issued, it would identify reasonable and prudent alternative actions including avoidance of Braunton's milk-vetch populations and critical habitat (applied through an AOC exception). Since a BO has not yet been issued by USFWS, at this time, DTSC has not determined specifically where to apply an AOC exception to protect this resource. DTSC will make any exception determinations during review of the various cleanup decision documents. Therefore, for purposes of this analysis and making a significance determination, it is assumed that the AOC exception would not be applied.

Direct impacts to the federally-endangered Braunton's milk-vetch would result from the permanent removal of individual plants and through the removal of soil within suitable habitat and/or areas that contain a seed bank within or adjacent to Braunton's milk-vetch populations. Removal of this plant's seed bank would prevent regeneration of the species and result in adverse indirect impacts to its population. Of the 66.96 acres of critical habitat for Braunton's milk-vetch within SSFL, approximately 41.7 acres of critical habitat for Braunton's milk-vetch occurs within the overall site cleanup and would be directly impacted as a result of remediation. In addition, 9.1 acres of occupied habitat that is not designated critical habitat occurs within the overall site cleanup and would be directly impacted. As described in Mitigation Measures BIO-1 and BIO-2, prior to initiating remediation and/or ground disturbing activities, a USFWS-approved biologist would flag and/or fence the limits of known individuals or populations of Braunton's milk-vetch to avoid direct impacts. In addition, Mitigation Measure BIO-3 would be implemented, which requires focused surveys for Braunton's milk-vetch to be conducted within suitable habitat prior to any ground disturbances. Nonetheless, direct impacts to Braunton's milk-vetch and critical habitat would be significant and unavoidable.

Indirect impacts to Braunton's milk-vetch and designated critical habitat would result expansion of onsite invasive weeds and from the introduction of noxious weeds from vehicles traveling from offsite locations. However, the project would implement a weed management plan to minimize the spread of noxious weeds as identified in Mitigation Measure BIO-4; therefore, indirect impacts from invasive weeds would be less than significant. This plant, like many chaparral species, is fire-adapted and requires wildfire or other disturbance to trigger germination of dormant seeds. Mitigation Measure BIO-3 would require the development of a conservation plan in consultation with USFWS to minimize direct or indirect impacts to Braunton's milk-vetch.

5 Under the ESA, jeopardy occurs when an action is reasonably expected, directly or indirectly, to diminish a species' numbers, reproduction, or distribution so that the likelihood of survival and recovery in the wild is appreciably reduced.

Conclusion: A concentrated population of Braunton's milk-vetch occurs within Area IV. However, the entire project site has not been surveyed for this federally-endangered species; therefore, additional populations may occur elsewhere within the project site where suitable habitat is present. Mitigation Measures BIO-1 through BIO-4 would avoid and minimize direct or indirect impacts to Braunton's milk-vetch and designated critical habitat to the extent feasible; however, as complete avoidance is not possible due to the extent of soils above the LUT values in Area IV, overall site cleanup would have a substantial adverse effect on Braunton's milk-vetch and its designated critical habitat. In addition, DTSC has not yet determined whether to apply AOC exceptions to protect this resource. Therefore, impacts would be significant and unavoidable.

Impact 4.3-1a Determination: *Upon implementation of Mitigation Measure BIO-1 through BIO-4, impacts from the* ***overall site cleanup*** *to Braunton's milk-vetch would be* ***significant and unavoidable****.*

Initial Project Assessment

Impact 4.3-1b: Would implementation of the **initial activities** have a substantial adverse effect either directly or through habitat modification on Braunton's milk-vetch or its designated critical habitat?

As discussed in Section 3.7, *Initial Activities*, the RPs would implement projects as soon as possible after approval by DTSC. The following discussions addresses impacts related to those activities.

DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal (Impact 4.3-1b)

An area of approximately 2 acres with radionuclides above the preliminary LUT values is proposed for removal in Area IV and is located within a known Braunton's milk-vetch population and designated critical habitat for this species. Mitigation Measures BIO-1 and BIO-2 would be implemented prior to initiating remediation activities to avoid and minimize impacts to Braunton's milk-vetch populations and critical habitat to the extent practicable. To ensure that unidentified populations of Braunton's milk-vetch would also be flagged for avoidance to the extent possible, Mitigation Measure BIO-3 requires focused surveys to be conducted within areas of suitable habitat (where this species has not been previously documented), and the development of a conservation plan to protect the species in perpetuity. Furthermore, indirect impacts would be minimized with the implementation of Mitigation Measure BIO-4 which would reduce the potential for spreading noxious weeds into areas of suitable Braunton's milk-vetch habitat from equipment and vehicles that would be used during cleanup operations. However, complete avoidance is not possible, due to the extent of soils above LUT values in this area.

Conclusion: Mitigation Measures BIO-1 through BIO-4 would avoid and minimize direct or indirect impacts to Braunton's milk-vetch and designated critical habitat to the extent feasible; however, as complete avoidance is not possible due to the extent of soils above

LUT values in Area IV, soil removal associated with DOE's initial project would have a substantial adverse effect on Braunton's milk-vetch and its designated critical habitat, and impacts would be significant and unavoidable.

NASA Liquid Oxygen Plant (Impact 4.3-1b)

Based on a rare plant survey conducted in 2011, Braunton's milk-vetch has not been detected within Area I or Area II. There is no USFWS-designated critical habitat for Braunton's milk-vetch within NASA areas; however suitable vegetation and the same soil type found within critical habitat in Area IV is present, including in NASA's initial project areas (Area I) where chaparral and Venturan coastal sage scrub exists. Disturbances to these suitable habitats would result in direct impacts to Braunton's milk-vetch if recent focused surveys confirm presence. Mitigation Measure BIO-3 would require focused surveys be conducted within suitable habitat prior to vegetation or ground disturbance to determine if Braunton's milk-vetch is present. If Braunton's milk-vetch is detected during focused surveys, flagging and avoidance of areas occupied by Braunton's milk-vetch would be applied to the extent feasible. Implementation of Mitigation Measures BIO-1 and BIO-2 would require biological monitoring and agency consultation would be required prior to any disturbance to Braunton's milk-vetch plants. Moreover, BIO-4 would also minimize the introduction of noxious weeds into areas of suitable habitat to prevent indirect impacts from invasive weeds outcompeting milk-vetch seedlings.

Conclusion: Mitigation Measures BIO-1 through BIO-4 would avoid and minimize direct or indirect impacts to Braunton's milk-vetch plants. Therefore, NASA initial project would not have a substantial adverse effect, either directly or through habitat modification, on Braunton's milk-vetch or its designated critical habitat. Impacts would be less than significant with mitigation.

Demolition Activities (Impact 4.3-1b)

Existing infrastructure within currently developed or disturbed areas does not provide habitat for Braunton's milk-vetch. Indirect impacts to Braunton's milk-vetch populations elsewhere within the project site would result from the spread of noxious weeds by equipment or workers involved in demolition activities; however, such indirect impacts would be unlikely and less than significant.

Conclusion: Demolition activities would not have a substantial adverse effect either directly or through habitat modification on Braunton's milk-vetch or its designated critical habitat, because the infrastructure located within developed and disturbed areas does not contain suitable habitat. Therefore, impacts would be less than significant and no mitigation would be required.

RCRA Post-Closure and Hazardous Waste Facility Closure (Impact 4.3-1b)

This discussion addresses the following closure projects described in Section 3.7.4, *RCRA Post-Closure and Hazardous Waste Facility Closure*, of this PEIR:

- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure

- Hazardous Waste Management Facility Closure

The RCRA hazardous waste facilities located within developed or disturbed areas do not provide habitat for Braunton's milk-vetch. Closures of these facilities include demolition of buildings and other physical infrastructure such as concrete, steel and appurtenances, along with sampling, excavation and disposal of TTF soils and debris. Indirect impacts to Braunton's milk-vetch populations elsewhere within the project site would result from the spread of noxious weeds by equipment or workers involved in the closure of the hazardous waste facilities; however, such indirect impacts would be unlikely and less than significant.

> Conclusion: Activities associated with the RCRA hazardous waste facilities closures would not have a substantial adverse effect either directly or through habitat modification on Braunton's milk-vetch or its designated critical habitat, since the location of the facilities are disturbed or developed and not within, or immediately adjacent to, areas providing suitable habitat. Therefore, impacts would be less than significant and no mitigation would be required.

Areas I, II, and III Impoundment Post-Closure (Impact 4.3-1b)

Existing surface impoundments occupy existing developed areas that do not provide suitable habitat for Braunton's milk-vetch, and are located outside of designated critical habitat for this species. Therefore, ongoing maintenance and inspections of surface impoundment caps, surface water diversion infrastructure, and groundwater monitoring wells associated with operations of the impoundment post-closure permit renewals would not impact Braunton's milk-vetch, or any areas containing suitable habitat or designated critical habitat.

> Conclusion: Post-closure monitoring and maintenance activities would not have an effect either directly or through habitat modification on Braunton's milk-vetch or its designated critical habitat. Potential impacts would be less than significant and no mitigation would be required.

Impact 4.3-1b Determination: *Although implementation of Mitigation Measures BIO-1 through BIO-4 would reduce impacts from some of the* ***initial activities*** *to Braunton's milk-vetch; impacts associated with removal of Area IV soils above the LUT values would be* ***significant and unavoidable****.*

4.3.5.2. Sensitive or Special-Status Species

Program Assessment

Impact 4.3-2a: Would implementation of the **overall site cleanup** have a substantial adverse effect either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS?

Overall Site Cleanup (Impact 4.3-2a)

The majority of cleanup activities would occur in disturbed or developed areas, some of which support, or have the potential to support, a number of special-status species. If present, special-status plant or animal species would be temporarily displaced or could be killed during project implementation. The special-status plant and wildlife species known to be present, including those that have a moderate or high potential to occur on the proposed remediation areas (Tables 4.3-3 and 4.3-4), are evaluated below.

Special-Status Plants

Direct impacts to special-status plant species would include permanent removal during soil and groundwater remediation. Special-status plant species known to be present within the project site include Malibu baccharis, Catalina mariposa lily, slender mariposa lily, Plummer's mariposa lily, Santa Susana tarplant, and ocellated Humboldt lily. Soil excavation and remediation treatment would also remove or damage any seed bank, which would affect the sustainability of a species by reducing the potential for natural regeneration to occur and reducing its genetic diversity. Indirect impacts to special-status plant species would result from the introduction of noxious weeds in proposed remediation areas from vehicles and equipment transporting non-native seed and plant parts from offsite locations. However, Mitigation Measure BIO-4 would require the RPs to implement a weed management plan to minimize the spread of noxious weeds.

Malibu baccharis occurs within undisturbed areas of northern mixed chaparral, as well as those that have previously burned within Area IV. Slender mariposa lily has been documented in Area II, Area IV and Northern Undeveloped Area, and Plummer's mariposa lily is known to occur within Area I, Area II, Area IV and the Northern Undeveloped Area. Avoidance of the potentially-occurring special-status plant species may not be feasible within soil cleanup areas. Vegetation disturbance or removal within chaparral, coastal scrub, or grassland areas associated with excavation of soil remediation areas, borrow areas, construction of infrastructure, or roadway improvements, would impact these rare and/or locally important plants, which would be considered a potentially significant impact. Further, vegetation disturbance or removal would eliminate or otherwise damage the dormant seed bank and genetic diversity repository for Malibu baccharis. Mitigation Measure BIO-5 would require revegetation of native habitats that would be removed as part of soil remediation efforts. As specified in Mitigation Measure BIO-6, preconstruction surveys would be required to identify and avoid special-status plants, as well as mitigation if any such plants cannot be avoided.

Roughly 3,000 Catalina mariposa lilies were found in the Southern Undeveloped Area in April 2014 within and adjacent to the westernmost soil borrow area. Specifically, roughly 500 plants were observed within the area being considered as a soil borrow site located on both sides of the existing unpaved access road that currently consists of annual grassland intermixed with laurel sumac scrub. The population of approximately 2,500 (or more) Catalina mariposa lilies located near an ephemeral drainage would be avoided (and unaffected) by project activities. Approximately 300 Catalina mariposa lilies found in the Southern Undeveloped Area in May 2014 that are scattered in and around the easternmost potential soil borrow areas would potentially be affected by excavation activities (Padre, 2013). In addition, populations have been

observed within grasslands adjacent to northern mixed chaparral in the western end of Area IV, which may also be disturbed. Although Catalina mariposa lily is a CDFW "watch list species of limited distribution" and not currently considered by resource agencies to be rare, the loss of approximately 800 individuals may have an adverse effect on the sustainability of the local population, which is considered a potentially significant impact. However, Mitigation Measure BIO-5 would require revegetation of habitat suitable for supporting Catalina mariposa lilies. Moreover, Mitigation Measure BIO-6 would ensure that identification, avoidance, and any required mitigation for this species would occur if this species is determined to be present in any areas that would be impacted by remediation operations.

Santa Susana tarplant is prevalent onsite (an estimated 12,000 individuals), with the majority of the population occurring within Area IV and Northern Undeveloped Area, as well as Area I, Area II, and Southern Undeveloped Area (Padre, 2013, 2014c). This species is primarily associated with sandstone outcrops in chaparral and coastal scrub, in addition to disturbed areas. Soil and groundwater remediation activities, as well as construction of associated infrastructure and road improvements would not occur within sandstone outcrops. However, recolonization of this species has occurred in formerly developed areas that have been revegetated within Area I. It is estimated that approximately 1,865 individuals may be present within this area and thus would be crushed or removed by project activities within Area I, as well as other areas of the project site that contain suitable habitat. However, since Santa Susana tarplant is scattered throughout the project site and not concentrated in any one area, it is expected that some individuals would be impacted by soil remediation activities. Santa Susana tarplant has been shown to require insect pollination in order to produce viable seed, and relies upon native insects (typically bees); therefore, any direct impacts to Santa Susana tarplant habitat would also impact habitat for insect pollinators. Areas currently supporting soil conditions suitable for this species that would be disturbed by remediation operations may be replaced with soil from offsite sources not derived from the Chatsworth Formation, which may permanently affect the re-establishment of this species, thus making reseeding ineffective. Mitigation Measure BIO-2 would require worker environmental training to help workers identify and avoid Santa Susana tarplant. Mitigation Measure BIO-7 would require Santa Susana tarplant habitat restoration and revegetation to promote the re-establishment of species that would be permanently removed, and would require obtainment of an incidental take permit from CDFW and mandatory mitigation for any impacts to this species. The AOC exception may be applied to areas containing substantial Santa Susana tarplant populations and soils above the LUT values. However, at this time, DTSC has not determined whether to apply an AOC exception to protect this resource. Therefore, for purposes of this analysis and making a significance determination, it is assumed that the AOC exception areas would not be applied. Therefore, impacts to Santa Susana tarplant populations located within remediation areas would be significant and unavoidable.

Ocellated Humboldt lily was observed in 2014 within the Southern Undeveloped Area (Padre, 2013) and Area II (Padre, 2013). A total of five locations of occurrence have been recorded within the project site since 2009. Numbers ranged from one to 100 individuals at each location; however, only one location is within proximity to soil and groundwater treatment areas. This locality is on the shoulder of the existing unpaved access road near the seeps in the Southern

Undeveloped Area where groundwater remediation is proposed via in situ bioremediation, which also provides access to the westernmost soil borrow area. This species is a CDFW "watch list species of limited distribution" and not currently considered by resource agencies to be rare. Therefore, the potential permanent removal of this species on the project site would not drop the regional population below self-sustaining levels, nor would potential impacts be considered substantial enough to warrant mitigation. Therefore, impacts to Ocellated Humboldt lily would be less than significant.

Other special-status plants with a moderate or high potential to occur onsite include western spleenwort, Brewer's calandrinia, round-leaved filaree, club-haired mariposa lily, late-flowered mariposa lily, Peirson's morning-glory, Lewis' evening-primrose, Island mountain-mahogany, San Fernando Valley spineflower, Parry's spineflower, small-flowered morning-glory, crowned forget-me-not, Norris' beard moss, slender-horned spineflower, trask yerba santa, Palmer's grapplinghook, vernal barley, mesa horkelia, decumbent goldenbush, tiny poppy, white-veined monardella, Ojai navarretia, chaparral nolina, Lyon's pentachaeta, hubby's phacelia, south coast branching phacelia, and California screw moss. These plant species have not been observed within Area I, Area III or Southern Undeveloped Area during a floristic survey conducted in 2014 (Padre, 2014c). Nonetheless, there is potential that these special-status plants and others (i.e., Ventura County Locally Important Plants) would establish within areas of suitable habitat prior to the initiation of soil or groundwater remediation activities. Mitigation Measure BIO-6 would ensure rare plant surveys would be conducted prior to initiation of vegetation clearing, and any required mitigation for impacts to special-status plant species would be developed in consultation with CDFW prior to any project-related ground disturbances. Further, Mitigation Measure BIO-2 would require worker environmental training to help workers be aware of areas containing special-status plants to be avoided. Therefore, impacts would be mitigated to less than significant.

Special-Status Wildlife

As identified in Table 4.3-4 and shown in Figure 4.3-5, a number of special-status wildlife species have been observed or detected at the project site during biological field surveys conducted at the site, and several have the potential to occur in areas not previously surveyed based on the presence of suitable habitats. The various ground disturbing activities associated with the project would result in inadvertent mortality of common and special-status wildlife, as well as the temporal loss of foraging, breeding, and/or dispersal habitat.

Special-Status Invertebrates

No special-status invertebrates have been documented within the project site. Special-status invertebrates with a moderate or high potential to occur within the project site include the federally-listed vernal pool fairy shrimp, Riverside fairy shrimp, Gertsch's socalchemmis spider, and Santa Monica grasshopper. In addition, invertebrates considered by Ventura County to be locally important species and potentially occur in the project site include Zaca shoulderband snail, Ventura shoulderband snail, Matilija shoulderband snail, and walking stick.

The proposed remediation areas may contain vernal pools and other seasonal aquatic features (including manmade features such as footprints remaining from removed infrastructure) that

would provide suitable habitat for the two federally listed fairy shrimp species. No records of either species are currently known, although focused surveys have not been conducted within the project site (USFWS, 2010). Because the common versatile fairy shrimp (*Branchinecta lindahli*) has been detected onsite, it has been confirmed that the vernal pools and seasonal ponds that have been surveyed do provide suitable habitat for fairy shrimp invertebrates. If the federally-listed species are present on habitats that have not been surveyed before, soil and groundwater remediation activities would impact these species. It has been confirmed that the pools located in sandstone outcrop areas would not be directly affected by remediation activities; however, depressions or other ponded features that provide suitable habitat for these species would be directly or indirectly impacted by remediation activities. Impacts to the federally-listed fairy shrimp species would be a significant impact. Implementation of Mitigation Measure BIO-8 requires that habitat assessments and full protocol surveys would be conducted for any sites containing suitable habitat impacted by remediation activities prior to ground disturbance. If focused surveys reveal that listed fairy shrimp are present in a remediation area, consultation with USFWS would be required to determine suitable avoidance measures.

Potential impacts to Gertsch's socalchemmis spider, Santa Monica grasshopper, Zaca shoulderband snail, Ventura shoulderband snail, Matilija shoulderband snail, and walking stick would occur within or near proposed remediation areas. Since surveys for these species have not been conducted in the project site, their presence and distribution within the proposed remediation areas is unknown. Mitigation Measure BIO-5 would require restoration of suitable habitat for these species. In addition, Mitigation Measure BIO-9 would require preconstruction capture and release surveys if any of these species are detected.

Special-Status Amphibians and Reptiles

Western Spadefoot

One special-status amphibian species, the western spadefoot (toad) has been observed within the project site. The most recent observation was made in 2014 in a plastic-lined depression at a former test stand location in the bowl area. Potential suitable habitat exists elsewhere within the project site including seasonal wetlands (i.e., vernal pools), depressions, and flat areas consisting of grasslands and disturbed areas (e.g., dirt access roads) capable of supporting pools after rain events. Direct impacts to this species would include mortality or injury during implementation activities or the temporary or permanent loss of breeding and/or burrowing (aestivation) habitat. Dewatering activities associated with groundwater remediation would impact aestivating western spadefoot by reducing soil moisture, which would be a significant impact if any spadefoot would be negatively affected. Mitigation Measure BIO-10 ensures that habitat assessments would be conducted for any sites containing suitable breeding and nearby burrowing habitat and avoidance during the active and breeding season to ensure no mortality to this species occurs.

California Red-Legged Frog and Western Pond Turtle

California red-legged frog and western pond turtle have not been documented in the project site, but suitable habitat is present within a limited number of artificially created ponds and pools that can support ponded water. These ponds are isolated from known populations of this species. The nearest known occurrence of California red-legged frog and western pond turtle are 3 miles to the

south and 1.2 miles to the northeast of the project site, respectively. These species require permanent surface water or pools to breed and forage.

Approximately 0.6 acre of designated critical habitat for California red-legged frog occurs near the western boundary of the project site, and overlaps with designated critical habitat for Braunton's milk-vetch within the project site. While this area occurs within the proposed remediation areas in Area IV, it is mapped as developed and chaparral habitat, which does not provide suitable breeding habitat for this species. Further, as the 0.6 acre of California red-legged frog critical habitat overlaps with Braunton's milk-vetch critical habitat within the project site, and DTSC may apply an AOC exception to avoid impacts to Braunton's milk-vetch and its critical habitat, which may also be applied to critical habitat for California red-legged frog. If the AOC exception is applied, no impacts to designated critical habitat would occur. However, at this time, DTSC has not determined whether to apply an AOC exception to protect this resource. Therefore, for purposes of this analysis and making a significance determination, it is assumed that the AOC exceptions would not be applied.

Remediation activities associated with dewatering of ponds in remediation areas outside of California red-legged frog critical habitat would result in direct mortality or injury, as well as temporary habitat loss, which would be a potentially significant impact if either of these species are determined to be present. Mitigation Measure BIO-11 requires that focused surveys would be conducted for California red-legged frog within suitable habitat prior to and during construction, and requires monitoring and species avoidance. Mitigation Measure BIO-12 would require wildlife monitoring, avoidance and/or relocation of non-listed wildlife, including western pond turtle, so that no direct impacts occur. Impacts would be mitigated to less than significant.

Other Special-Status Amphibians and Reptiles

Silvery legless lizard, coastal western whiptail, San Bernardino ringneck snake, California mountain kingsnake, coast horned lizard, coast patch-nosed snake, and two-striped garter snake have all been documented within the project site. Although not previously observed, arboreal salamander and California glossy snake potentially occur in the project site as well. Potential impacts to the aforementioned species would result from temporary or permanent habitat loss. Mortality or injury would also occur during vegetation removal or other ground disturbance from use of heavy machinery and vehicles, or the placement of open pipes and trenches that entrap animals. Mitigation Measures BIO-5 would require restoration of impacted habitats, including suitable habitat for these species, and Mitigation Measure BIO-12 would require preconstruction trap and release surveys, monitoring, and avoidance if any of these species are found. Release sites should be suitable habitat adjacent to the impacted site, but some discussion should describe the release site and the capacity of the site to support these additional individuals. This impact is significant considering the potential magnitude of the rescue/relocation effort necessary for a site this large. Impacts would be mitigated to less than significant.

Special-Status Birds

Numerous birds have been documented within and adjacent to the project site, including the state-fully protected golden eagle. The Northern Undeveloped Area is known to support an active golden eagle nest annually within a large sandstone outcrop. As all remediation activities would

avoid rock outcrops, no direct impacts would occur to this known nest. Based on extensive bird surveys, no other golden eagle nests are present in the vicinity of the project site. Other special-status bird species that have been documented, or have the potential to occur, in the project site include Cooper's hawk, sharp-shinned hawk, tri-colored blackbird, southern California rufous crowned sparrow, great blue heron, Bell's sage sparrow, burrowing owl, Swainson's hawk, yellow warbler, white-tailed kite, American peregrine falcon, yellow-breasted chat, loggerhead shrike, double-crested cormorant, coastal California gnatcatcher, and least Bell's vireo. Construction associated with soil and groundwater remediation activities such as vegetation removal and excavation would result in mortality or injury to nestlings, as well temporary or long-term loss of suitable nesting and foraging habitats. Mitigation Measure BIO-1 requires work zones to be monitored by a qualified biologist for the presence of state or federally-listed species, including coastal California gnatcatcher and least Bell's vireo, prior to and during work activities. Further, focused surveys for burrowing owl, least Bell's vireo and coastal California gnatcatcher would identify localities and minimize potential impacts to these species through avoidance, as required in Mitigation Measures BIO-13, BIO-14, and BIO-15, respectively. Mitigation Measure BIO-5 would be implemented to restore habitats that are suitable for supporting special-status avian species. Cleanup activities that take place during the avian breeding season (January 1 to September 15) would result in harm to protected avian species and/or the destruction of active nests or eggs that are protected in accordance with the MBTA and California Fish and Game Code Sections 3503 and 3503.5. However, Mitigation Measure BIO-16 would implement the protection of special-status avian species and active nests. Through implementation of mitigation measures that require avoidance and habitat restoration, impacts to native birds would be less than significant.

Special-Status Mammals

Special-status mammals that have been documented within the project site include ringtail, San Diego black-tailed jackrabbit, bobcat, San Diego desert woodrat, mule deer, Los Angeles little pocket mouse, pallid bat, Townsend's big-eared bat, California mastiff bat, western red bat, hoary bat, California leaf-nosed bat, western small-foot myotis, and yuma myotis. Although not detected, spotted bat has a high potential to occur due to high-quality suitable habitat for this species in the project site.

Ringtail

Ringtail, a California fully protected species, has been observed at the project site. This species prefers riparian and shrubby semi-arid habitat with rocky outcroppings or canyons, but is also found in arid regions, deserts, chaparral, woodlands, and forests. Remediation activities would avoid rock outcroppings, but loss of habitat for ringtail would occur in the other habitats from disturbances to vegetation. Mitigation Measure BIO-5 would require restoration of native vegetation, including suitable habitat for ringtail. Take of California fully protected species is prohibited, and project cleanup activities located near dens that have not yet been discovered, which would present indirect effects caused by noises and vibrations that would affect the sleep patterns of this nocturnal species. Mitigation Measure BIO-17 would require a habitat assessment for ringtail and preparation of a protection plan to be approved by the CDFW to avoid impacts to this species. Impacts would be mitigated to less than significant.

Special-Status Bats

Remediation activities would avoid rock outcrops and crevices that serve as potential bat day roost or maternity roost sites; therefore, no impacts are anticipated to bat roosts within rock outcrop habitat. Potential direct impacts to other types of day or maternity roosts such as suitable trees and abandoned buildings would occur as a result of vegetation clearance or building demolition. However, implementation of Mitigation Measure BIO-18 would avoid any direct or indirect impacts through implementation of a habitat assessment for potential bat roost sites and consultation with CDFW on avoidance measures and any required habitat mitigation prior to the initiation of disturbances near potential roosting habitats. Impacts would be mitigated to less than significant.

San Diego Black-tailed Jackrabbit, Bobcat, San Diego Desert Woodrat, Mule Deer, and Los Angeles Little Pocket Mouse

Potential impacts to San Diego black-tailed jackrabbit, bobcat, San Diego desert woodrat, mule deer, and Los Angeles little pocket mouse may occur as result of habitat loss, or direct mortality or injury during ground disturbing activities. BIO-5 would be implemented to restore suitable habitats for these species, and Mitigation Measure BIO-12 would require biological monitoring to ensure that direct impacts to these special-status wildlife would be avoided or minimized. Impacts would be mitigated to less than significant.

Conclusion: Implementation of Mitigation Measures BIO-2, and BIO-4 through BIO-7 would avoid and/or minimize potential impacts to special-status plant species. Implementation of Mitigation Measures BIO-1, BIO-5, and BIO-8 through BIO-18 would avoid and/or minimize potential impacts to special-status wildlife species. At this time, DTSC has not determined whether to apply an AOC exception to protect this resource. Therefore, for purposes of this analysis and making a significance determination, it is assumed that the AOC exception would not be applied, and potential impacts would be significant and unavoidable.

Impact 4.3-2a Determination: *Implementation of Mitigation Measures BIO-1, BIO-2, and BIO-4 through BIO-18, would reduce impacts to special-status species from* ***overall site cleanup****. However, at this time, DTSC has not determined whether to apply an AOC exception to protect special-status species. Therefore, for purposes of this analysis and making a significance determination, it is assumed that the AOC exception area would not be applied and impacts to special-status species would be* ***significant and unavoidable****.*

Initial Project Assessment

Impact 4.3-2b: Would implementation of the **initial activities** have a substantial adverse effect either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS?

DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal (Impact 4.3-2b)

The excavation and remediation of 392,000 cubic yards of soil from Area IV would remove or otherwise disturb approximately 23 acres of habitat including chaparral, Venturan coastal sage scrub, mulefat scrub, coast live oak riparian forest, coast live oak woodland, California walnut woodland, grassland, rock outcrop/vegetated, and disturbed and developed areas. Affected soils would be excavated and the excavated areas backfilled and restored by grading and reseeding.

Special-Status Plants

The special-status plant species impacted in Area IV would be similar to those identified for the overall site cleanup, above. Similarly, potential impacts to special-status plant species would include permanent removal of individual plants during soil excavation, removal or damage to any seed banks, and introduction of noxious weeds, as described for the overall site cleanup. The same mitigation measures would apply to identify, avoid and minimize potential direct and indirect impacts. Potential impacts to Braunton's milk-vetch and designated critical habitat are discussed under a separate analysis (Impact 4.3-1a). At this time, DTSC has not determined whether to apply an AOC exception to protect this resource. Therefore, for purposes of this analysis and making a significance determination, it is assumed that the AOC exception area would not be applied and impacts to Santa Susana tarplant populations would be significant and unavoidable.

Special-Status Wildlife

Special-Status Invertebrates

No special-status invertebrates have been documented within the project site, including DOE's initial project soil removal area; however, focused surveys have not been conducted. Special-status invertebrates with a moderate or high potential to occur include the federally-listed vernal pool fairy shrimp and Riverside fairy shrimp, Gertsch's socalchemmis spider, and Santa Monica grasshopper. In addition, invertebrates considered by Ventura County to be locally important species and potentially occur in the project site include Zaca shoulderband snail, Ventura shoulderband snail, Matilija shoulderband snail, and walking stick.

The proposed soil removal areas in DOE's initial project area may contain seasonal aquatic features that provide suitable habitat for the two federally listed fairy shrimp species. While potential pools located in sandstone outcrop areas would not be directly affected by soil removal, depressions or other seasonally ponded features (including manmade features such as footprints remaining from removed infrastructure) provide suitable habitat for these species would be directly or indirectly impacted by project activities. Impacts to the federally-listed fairy shrimp species would be a significant impact. Implementation of Mitigation Measure BIO-8 requires that habitat assessments and full protocol surveys would be conducted for any sites containing suitable habitat for Riverside fairy shrimp or vernal pool fairy shrimp that would be impacted by remediation activities prior to ground disturbance. If focused surveys reveal that listed fairy shrimp are present within the soil removal area, consultation with USFWS would be required to determine suitable avoidance measures.

Potential impacts to Gertsch's socalchemmis spider, Santa Monica grasshopper, Zaca shoulderband snail, Ventura shoulderband snail, Matilija shoulderband snail, and walking stick would occur within or near soil removal areas. Since surveys for these species have not been conducted, their presence and distribution within suitable habitats of the soil removal areas is unknown. Mitigation Measure BIO-5 would require restoration of suitable habitat for these species. In addition, Mitigation Measure BIO-9 would require preconstruction capture and release surveys if any of these species are detected. Impacts would be mitigated to less than significant.

Special-Status Amphibians and Reptiles

Western Spadefoot

Vernal pools within DOE's initial project area are not located within the soil removal areas; however, potential suitable habitat exists elsewhere within the soil removal areas including depressions and flat areas consisting of grasslands and disturbed areas (e.g., dirt access roads) capable of supporting pools after rain events. Direct impacts to this species include mortality or injury during cleanup activities or the temporary or permanent loss of breeding and/or burrowing (aestivation) habitat. Mitigation Measure BIO-10 would ensure that habitat assessments would be conducted for any sites containing suitable breeding and nearby burrowing habitat for western spadefoot and avoidance during the active and breeding season to ensure no mortality to this species occurs. Impacts would be mitigated to less than significant.

California Red-Legged Frog and Western Pond Turtle

No suitable habitat within the project site (i.e., artificially created ponds/pools) for California red-legged frog or western pond turtle is present within the DOE initial project area; therefore, no impacts to either species or their habitats would occur as a result of soil removal within the DOE initial project area. Critical habitat for California red-legged frog does not occur within the DOE initial project area. No impacts would occur and no mitigation would be required.

Other Special-Status Amphibians and Reptiles

Silvery legless lizard, coastal western whiptail, San Bernardino ringneck snake, coast horned lizard, coast patch-nosed snake, and two-striped garter snake have all been documented within the project site, and some of these species have been documented in Area IV. Although not previously observed, arboreal salamander and California glossy snake potentially occur within or near the soil removal areas as well. Potential impacts to the aforementioned species would result from temporary or permanent habitat loss. Mortality or injury would also occur during vegetation removal or other ground disturbance from use of heavy machinery and vehicles, or the placement of open pipes and trenches that entrap animals. Mitigation Measure BIO-5 would require restoration of impacted habitats, including suitable habitat for these species, and Mitigation Measure BIO-12 would require preconstruction trap and release surveys, monitoring, avoidance if any of these species are found. Impacts would be mitigated to less than significant.

Special-Status Birds

Numerous birds have been documented within and adjacent to the project site, including the state-fully-protected golden eagle. While the golden eagle has not been observed nesting within DOE's initial project area, an active golden eagle nest is known to occupy a large sandstone outcrop within the Northern Undeveloped Area, adjacent to DOE's initial project area. As all soil removal

activities would avoid rock outcrops, no impacts would occur to this known nest. Based on extensive bird surveys, no other golden eagle nests are present in the vicinity of the project site. Other special-status bird species that have the potential to occur in or near the soil removal areas based on the affected habitats include Cooper's hawk, sharp-shinned hawk, southern California rufous crowned sparrow, Bell's sage sparrow, burrowing owl, Swainson's hawk, yellow warbler, white-tailed kite, American peregrine falcon, yellow-breasted chat, loggerhead shrike, coastal California gnatcatcher, and least Bell's vireo. Construction associated with soil removal such as vegetation removal and excavation would result in mortality or injury to nestlings, as well temporary or long-term loss of suitable nesting and foraging habitats. Mitigation Measure BIO-1 requires work zones to be monitored by a qualified biologist for the presence of state or federally-listed species, including coastal California gnatcatcher and least Bell's vireo, prior to and during work activities. Further, focused surveys for burrowing owl, least Bell's vireo and coastal California gnatcatcher would identify localities and minimize potential impacts to these species through avoidance, as required in Mitigation Measures BIO-13, BIO-14, and BIO-15, respectively. Mitigation Measure BIO-5 would be implemented to restore habitats capable of supporting special-status avian species. Cleanup activities that take place during the avian breeding season (January 1 to September 15) would result in harm to protected avian species and/or the destruction of active nests or eggs protected in accordance with the MBTA and California Fish and Game Code Sections 3503 and 3503.5. However, Mitigation Measures BIO-16 would ensure the protection of special-status avian species and active nests. Through implementation of mitigation that requires avoidance and habitat restoration, impacts to special-status birds would be considered less than significant.

Special-Status Mammals

Special-status mammals that have been documented within the project site that would potentially be found within or near the DOE's initial project soil removal areas based on the affected habitats include ringtail, San Diego black-tailed jackrabbit, bobcat, San Diego desert woodrat, mule deer, Los Angeles little pocket mouse, and a variety of special-status bats.

Ringtail

Ringtail, a California fully protected species, has the potential to occur within riparian and shrubby semi-arid habitat with rocky outcroppings or canyons, but is also found in chaparral, woodlands, and forests. Soil removal activities would avoid rock outcroppings, but loss of habitat for ringtail would potentially occur in the other habitats from disturbances to vegetation. Mitigation Measure BIO-5 would require restoration of native vegetation, including suitable habitat for ringtail. Take of California fully protected species is prohibited, and cleanup activities located near dens that have not yet been discovered would present indirect effects caused by noises and vibrations that would affect the sleep patterns of this nocturnal species. Mitigation Measure BIO-17 would require a habitat assessment for ringtail and preparation of a protection plan to be approved by the CDFW to avoid impacts to this species. Impacts would be mitigated to less than significant.

Special-Status Bats

Within the DOE initial project area soil removal areas, approximately 1.5 percent of potential foraging habitat for special-status bats would be removed from forest, woodland, and grassland habitats from the existing amount of bat foraging habitat available site-wide. These habitats provide foraging habitat for pallid bat, Townsend's big-eared bat, California mastiff bat, western red bat, hoary bat, California leaf-nosed bat, western small-foot myotis, yuma myotis, and spotted bat; however, suitable foraging habitat for these species would be available within and in the vicinity of the proposed soil removal areas, such as the canyon drainages north of the Northern Undeveloped Area. Therefore, temporary impacts to foraging habitat would be less than significant and no mitigation is required.

Soil removal would avoid rock outcrops and crevices that serve as potential bat day roost or maternity roost sites; therefore, no impacts are anticipated to bat roosts within rock outcrop habitat. Limited potential day or maternity roosting habitat for hoary bat and western red bat occurs within the coast live oak riparian forest habitat, and potential direct impacts would occur as a result of vegetation clearance. Therefore, Mitigation Measure BIO-18 requires identification and avoidance of any potential bat roost sites, as well as consultation with CDFW on additional avoidance measures and any required habitat mitigation prior to the initiation of disturbances near potential roosting habitats. Through implementation of mitigation measures, impacts to special-status bats would be less than significant.

San Diego Black-Tailed Jackrabbit, Bobcat, San Diego Desert Woodrat, Mule Deer, and Los Angeles Little Pocket Mouse

Potential impacts to San Diego black-tailed jackrabbit, bobcat, San Diego desert woodrat, mule deer, and Los Angeles little pocket mouse may occur as result of habitat loss, or direct mortality or injury during ground disturbing activities in DOE's initial project area. Mitigation Measure BIO-5 would be implemented to restore suitable habitats for these species, and Mitigation Measure BIO-12 would require biological monitoring to avoid direct impacts to these special-status wildlife.

> Conclusion: Implementation of Mitigation Measures BIO-2, and BIO-4 through BIO-7 would avoid and/or minimize potential impacts to special-status plant species. Implementation of Mitigation Measures BIO-1, BIO-5, BIO-8 through BIO-10, and BIO-12 through BIO-18 would avoid and/or minimize potential impacts to special-status wildlife species. At this time, DTSC has not determined whether to apply an AOC exception to protect Santa Susana tarplant. Therefore, for purposes of this analysis and making a significance determination, it is assumed that the AOC exception would not be applied, and potential impacts would be significant and unavoidable.

NASA Liquid Oxygen Plant (Impact 4.3-2b)

The excavation and remediation of 73,533 cubic yards of soil would remove or otherwise disturb approximately 16 acres of habitat including coast live oak woodland, rock outcrop/vegetated, coast live oak woodland (riparian), mulefat scrub, chaparral, Venturan coastal sage scrub, and disturbed and developed areas. Affected soils would be excavated and the excavated areas backfilled and restored by grading and reseeding.

Special-Status Plants

The special-status plant species that would be impacted by NASA's initial project would be similar to those identified for the overall site cleanup, above. Similarly, potential impacts to special-status plant species would include permanent removal of individual plants during soil excavation, removal or damage to any seed banks and insect pollinator habitats, and introduction of noxious weeds, as described for the overall site cleanup. The same mitigation measures would apply to identify, avoid and minimize potential direct and indirect impacts. Potential impacts to Braunton's milk-vetch and designated critical habitat are discussed under a separate analysis (Impact 4.3-1a). However, impacts to Santa Susana tarplant would be less than significant with mitigation regardless of applicability of the AOC exception because tarplants have not been reported in the LOX area. Therefore, impacts would be mitigated to less than significant.

Special-Status Wildlife

Special-Status Invertebrates

No special-status invertebrates have been documented within the project site, including the NASA initial project soil removal area; however, focused surveys have not been conducted. The special-status invertebrate species that would be affected and potential impacts would be the same as those discussed for DOE's initial project, above. Implementation of Mitigation Measures BIO-5, BIO-8, and BIO-9 would reduce potential impacts to special-status invertebrates to less than significant.

Special-Status Amphibians and Reptiles

Western Spadefoot

Potential suitable habitat for western spadefoot exists within NASA's initial project soil removal area, including depressions and flat areas consisting of disturbed areas (e.g., dirt access roads) capable of supporting pools after rain events. Direct impacts to this species would include mortality or injury during cleanup activities or the temporary or permanent loss of breeding and/or burrowing (aestivation) habitat. Mitigation Measure BIO-10 would ensure that habitat assessments would be conducted for any sites containing suitable breeding and nearby burrowing habitat and avoidance during the active and breeding season to ensure no mortality to this species occurs. Impacts would be mitigated to less than significant.

California red-legged Frog and Western Pond Turtle

No suitable habitat (i.e., artificially created ponds/pools) for California red-legged frog or western is present within NASA's initial project area; therefore, no impacts to either species or their habitats would occur as a result of soil removal within NASA's initial project area. No impacts would occur and no mitigation would be required.

Other Special-Status Amphibians and Reptiles

Based on habitats impacted by NASA's initial project, potential impacts to silvery legless lizard, coastal western whiptail, San Bernardino ringneck snake, California mountain kingsnake, coast horned lizard, coast patch-nosed snake, two-striped garter snake, arboreal salamander, and California glossy snake would be the same as those discussed for DOE's initial project, above. Implementation of Mitigation Measures BIO-5 and BIO-12 would reduce potential impacts to these species to less than significant.

Special-Status Birds

The special-status birds that would be affected and potential impacts would be the same as those discussed for DOE's initial project, above. Implementation of Mitigation Measures BIO-1, BIO-5, and BIO-13 through BIO-16 would reduce potential impacts to special-status birds to less than significant.

Special-Status Mammals

Special-status mammals that have been documented within the project site that would potentially be found within or near NASA's initial project soil removal area based on the affected habitats include ringtail, San Diego black-tailed jackrabbit, bobcat, San Diego desert woodrat, mule deer, Los Angeles little pocket mouse, and a variety of special-status bats.

Ringtail

Potential impacts to ringtail would be the same as those described for DOE's initial project, above. Implementation of Mitigation Measure BIO-17 would ensure avoidance of impacts to this species, and potential impacts would be less than significant.

Special-Status Bats

Potential impacts to special-status bat species would be the same as those described for DOE's initial project, above. Implementation of Mitigation Measure BIO-18 would ensure identification and avoidance of potential bat roost sites, and potential impacts would be less than significant.

San Diego Black-Tailed Jackrabbit, Bobcat, San Diego Desert Woodrat, Mule Deer, and Los Angeles Little Pocket Mouse

As discussed under the overall site cleanup and DOE's initial project, potential impacts to San Diego black-tailed jackrabbit, bobcat, San Diego desert woodrat, mule deer, and Los Angeles little pocket mouse may occur as result of habitat loss, or direct mortality or injury during ground disturbing activities. Mitigation Measure BIO-5 would be implemented to restore suitable habitats for these species, and Mitigation Measure BIO-12 would require biological monitoring to ensure that direct impacts to these special-status wildlife would be avoided.

> Conclusion: Implementation of Mitigation Measures BIO-2, and BIO-4 through BIO-7 would avoid and/or minimize potential impacts to special-status plant species. Implementation of Mitigation Measures BIO-1, BIO-5, BIO-8 through BIO-10, and BIO-12 through BIO-18 would avoid and/or minimize potential impacts to special-status wildlife species. Therefore, implementation of NASA's initial project would not have a substantial adverse effect, either directly or through habitat modification, on special-status species or their habitats. Potential impacts would be less than significant with mitigation.

Demolition Activities (Impact 4.3-2b)

Infrastructure that would be demolished in DOE areas are all located within currently developed areas, most of which do not support any vegetation and likewise do not provide habitat for special-status plants or special-status wildlife species. Demolition of buildings and infrastructure would potentially impact nesting birds or roosting bats, as previously discussed for the overall

site cleanup. Implementation of Mitigation Measures BIO-16 and BIO-18 would minimize potential impacts to nesting birds and roosting and wintering bats, respectively, through avoidance/exclusion of active nests and roosts. Common terrestrial wildlife species that move into maintenance areas would potentially be killed or injured by equipment or vehicles; however, implementation of Mitigation Measures BIO-2 and BIO-12 would require worker environmental awareness training and wildlife monitoring to further minimize potential impacts to terrestrial wildlife that would be encountered.

> Conclusion: Implementation of Mitigation Measures BIO-2, BIO-12, BIO-16, and BIO-18 would avoid and minimize potential impacts to terrestrial wildlife, nesting birds and roosting bats. Therefore, demolition activities would not have a substantial adverse effect, either directly or through habitat modification, on special-status species or their habitats. Potential impacts would be less than significant with mitigation.

RCRA Post-Closure and Hazardous Waste Facility Closure (Impact 4.3-2b)

This discussion addresses the following closure projects described in Section 3.7.4, *RCRA Post-Closure and Hazardous Waste Facility Closure*, of this PEIR:

- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure

Cleanup activities related to the RCRA Post-Closure and Hazardous Waste Facility Closure would involve demolition of buildings and other physical infrastructure such as concrete, steel and appurtenances, along with minimal sampling, excavation and disposal of TTF soils and debris. As these facilities are within currently disturbed or developed areas that do not provide habitat for special-status plants or special-status wildlife, potential impacts would be the same as those discussed under the demolition activities, above. With implementation of Mitigation Measures BIO-16 and BIO-18, potential indirect impacts to nesting birds and roosting bats would be less than significant through avoidance/exclusion of active nests and maternity roosts. Common terrestrial wildlife species that move into maintenance areas would potentially be killed or injured by equipment or vehicles; however, implementation of BIO-2 and BIO-12 would require worker environmental awareness training and wildlife monitoring to further minimize potential impacts to terrestrial wildlife that would be encountered.

> Conclusion: Implementation of Mitigation Measures BIO-2, BIO-12, BIO-16 and BIO-18 would avoid and/or minimize potential impacts to terrestrial wildlife, nesting birds and roosting bats. Therefore, cleanup activities related to the RCRA Post-Closure and Hazardous Waste Facility Closure would not have a substantial adverse effect, either directly or through habitat modification, on special-status species or their habitats. Potential impacts would be less than significant with mitigation.

Areas I, II, and III Impoundment Post-Closure (Impact 4.3-2b)

The proposed activities associated with the impoundment monitoring and maintenance are limited to managing impoundments through ongoing monitoring and periodic maintenance of existing facilities including surface impoundment caps, surface water diversion infrastructure, and groundwater monitoring wells. As these existing facilities are located within developed or disturbed areas that do not provide suitable habitat for special-status plants or wildlife, impacts are not anticipated. Common terrestrial wildlife species that move into maintenance areas would potentially be killed or injured by equipment or vehicles; however, Mitigation Measures BIO-2 and BIO-12 would require worker environmental awareness training and wildlife monitoring as appropriate to minimize potential impacts to terrestrial wildlife that would be encountered.

> Conclusion: Implementation of Mitigation Measures BIO-2 and BIO-12 would avoid and minimize potential impacts to special-status terrestrial wildlife. Therefore, operational activities related to the Areas I/III Impoundment Post-Closure would not have a substantial adverse effect, either directly or through habitat modification, on special-status species or their habitats. Potential impacts would be less than significant with mitigation.

Impact 4.3-2(b) Determination: *Implementation of Mitigation Measures BIO-1, BIO-2, and BIO-4 through BIO-18, would reduce impacts to special-status species from* ***initial activities****. However, at this time, DTSC has not determined whether to apply an AOC exception to protect special-status species. Therefore, for purposes of this analysis and making a significance determination, it is assumed that the AOC exception area would not be applied and impacts to special-status species would be* ***significant and unavoidable****.*

4.3.5.3. Riparian Habitats and Other Sensitive Communities

Program Assessment

Impact 4.3-3a: Would implementation of the **overall site cleanup** have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS?

Overall Site Cleanup (Impact 4.3-3a)

As shown in Figure 4.3-2 and indicated in **Table 4.3-8**, soil remediation activities associated with the overall site cleanup are proposed within various aquatic/riparian habitats, as well as sensitive upland habitats, including chaparral, coast live oak woodland, southern California walnut woodland, Venturan coastal sage scrub, steep dipslope grassland, and vegetated rock outcrops. These habitats are sensitive due to the rarity of the vegetation in the region and they also provide valuable habitat for numerous wildlife species. While methods of soil remediation have not been identified in these areas, for purposes of this analysis, it is assumed that the habitats indicated below in Table 4.3-8 would be disturbed through excavation of the impacted soils. Some sensitive habitats such as southern California walnut woodland and coast live oak woodland would be avoided if the AOC exception is applied. However, at this time, DTSC has not determined where

to apply an appropriate AOC exception. Potential impacts to aquatic and riparian habitats resulting from soil remediation activities include disturbance or loss of sensitive habitat, as well as alterations to site hydrology (i.e., soil removal or grading along or near stream channels) which, in turn, would impact additional habitat areas offsite and/or downstream. As shown in Table 4.3-8, approximately 13.5 acres of riparian habitat and 340.2 acres of other sensitive natural communities would be directly impacted. The removal or disturbance of sensitive communities would result in temporary indirect impacts to wildlife during site cleanup activities, such as a loss of nesting and/or foraging habitat for common and special-status birds and terrestrial species, as previously discussed under Impact 4.3-1b. Mitigation Measure BIO-5 would require restoration of native vegetation communities, including sensitive natural communities in order to attempt to achieve long-term no net loss of sensitive natural communities on the SSFL site. However, since the exact sources of backfill are unknown at this time, and no more than 75 percent of excavated soil would be backfilled after soil removal, direct impacts to sensitive natural communities would be considered a permanent impact even with habitat restoration.

TABLE 4.3-8
OVERALL SITE CLEANUP –SENSITIVE HABITAT IMPACTS

Vegetation Community or Land Cover Type	Rarity Ranking[1]	Acreage
Shrublands		
Chaparral	Unranked	125.5
Venturan Coastal Sage Scrub	G3S3.1/LI	53.7
Foothill Woodlands		
Coast Live Oak Woodland (Upland) Woodland	G4S4/LI	62.6
Southern California Walnut Woodland	G2S2.1	11.6
Grasslands		
Steep Dipslope Grassland	Unranked	0.1
Riparian		
Coast Live Oak Riparian Woodland	G4S4/LI	11.6
Southern Willow Scrub	G3S2.1	1.9
Aquatic		
Open Water	Unranked	1.2
Wetland	Unranked	1.0
Other Land Cover Types		
Rockoutcrop/Vegetated	Unranked	84.5
Total		**353.7**

SOURCE: ESA, 2016.

Detailed vegetation mapping in accordance with CDFW methodology has not been conducted in all of the proposed remediation areas; For the purposes of determining impacts, any general community that would have a sensitive sub-community associated with it was considered

sensitive as a whole; therefore, the potential impacts to sensitive habitats as a result of overall site cleanup as shown in Table 4.3-8 represents the maximum area of impacts anticipated to sensitive communities based on the current vegetation map (Figures 4.3-1 through 4.3-2d). For example, chaparral areas are currently mapped as one (general) chaparral community, with no distinguishing made between specific (i.e., alliance-level) chaparral communities considered sensitive by CDFW, such as holly-leaf cherry chaparral or thick-leaf yerba santa scrub. As required under Mitigation Measure BIO-19, detailed vegetation mapping to the alliance or association-level is required in order to quantify impacts to sensitive natural communities based on the CDFW *California Vegetation Manual, Second Edition*) within areas that would be impacted by remediation activities prior to initiating any disturbances. This mitigation measure also requires a biologist to clearly demarcate the limits of any sensitive natural communities in the field that are adjacent to cleanup area to avoid inadvertent impacts related to remediation activities to the extent feasible. Precise mapping based on CDFW methodology would enable impacts to sensitive natural communities and riparian habitats to be accurately quantified and mitigated in order to appropriately restore habitats for each specific cleanup project. Mitigation Measure BIO-19 would also require consultation with Ventura County prior to disturbance of impacts to oak woodlands, which includes the preservation of a minimum of 50 percent of all oak woodlands onsite and compensatory mitigation for the remaining oak woodlands that would be impacting, including onsite restoration or payment into a CDFW-approved mitigation bank. Further, Mitigation Measure BIO-20 would require onsite seed collection to accumulate sufficient propagule material for the restoration of impacted native vegetation communities.

> Conclusion: The overall site cleanup would result in a permanent loss of riparian and sensitive natural communities despite implementation of habitat revegetation as required by Mitigation Measure BIO-5. Specifically, Mitigation Measure BIO-5 would require that a CDFW-approved restoration plan be prepared prior to any ground disturbances. In addition, Mitigation Measure BIO-19 would require detailed vegetation mapping prior to disturbance of vegetation in order to precisely quantify onsite sensitive natural communities that would be impacted and Mitigation Measure BIO-20 would require onsite seed collection for habitat restoration in order to sustain the endemic flora that currently exists. In accordance with Mitigation Measures BIO-19 and BIO-20, long-term impacts to riparian and/or sensitive communities would be offset by onsite restoration of equivalent habitat quality and/or payment into a CDFW-approved mitigation bank. However, even with implementation of these mitigation measures, the proposed project would have a significant effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS. Potential impacts would be significant and unavoidable.

Impact 4.3-3a Determination: *Upon implementation of Mitigation Measures BIO-5, BIO-19 and BIO-20, impacts to riparian habitat or other sensitive natural communities from the* ***overall site cleanup*** *would be* ***significant and unavoidable****.*

Initial Project Assessment

Impact 4.3-3b: Would implementation of the **initial activities** have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS?

DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal (Impact 4.3-3b)

Table 4.3-9, indicates the various sensitive upland and riparian habitats that would be affected by soil removal and remediation activities within DOE's initial project. Some sensitive habitats such as southern California walnut woodland and coast live oak woodland would be avoided if an AOC exception is applied. However, at this time, DTSC has not determined whether to apply an AOC exception. The majority of the habitat that would be affected by soil removal consists of chaparral and coast live oak woodland. The removal or disturbance of sensitive natural communities would result in the loss of nesting and/or foraging habitat for common and special-status bird and terrestrial species. Mitigation Measure BIO-5 would require restoration of native vegetation communities. As previously discussed for the overall site cleanup, Mitigation Measure BIO-19 would require all areas subject to disturbance to be surveyed in accordance with CDFW methodology, and require that potential impacts to sensitive habitats be quantified and restored/mitigated. Mitigation Measure BIO-20 would require onsite seed collection to accumulate sufficient propagule material for the restoration of impacted native vegetation communities. However, since the exact sources of backfill are unknown at this time, and no more than 75 percent of excavated soil would be backfilled after soil removal, direct impacts to sensitive natural communities would be considered a permanent impact even with habitat restoration.

TABLE 4.3-9
DOE SOIL REMOVAL – SENSITIVE HABITAT IMPACTS

Vegetation Community or Land Cover Type	Rarity Ranking[1]	Acreage
Shrublands		
Chaparral	Unranked	6.0
Venturan Coastal Sage Scrub	G3S3.1/LI	1.7
Foothill Woodlands		
Coast Live Oak Woodland (Upland)	G4S4/LI	2.8
Southern California Walnut Woodland	G2S2.1	0.1
Riparian		
Coast Live Oak Riparian Woodland	G4S4/LI	0.1
Other Land Cover Types		
Rockoutcrop/Vegetated	Unranked	1.2
Total		**11.9**

SOURCE: ESA, 2016.

Conclusion: The overall site cleanup would result in a permanent loss of riparian and sensitive natural communities despite implementation of habitat revegetation as required by Mitigation Measure BIO-5. Specifically, Mitigation Measure BIO-5 would require that a CDFW-approved restoration plan be prepared prior to any ground disturbances. In addition, Mitigation Measure BIO-19 would require detailed vegetation mapping prior to disturbance of vegetation in order to precisely quantify onsite sensitive natural communities that would be impacted and Mitigation Measure BIO-20 would require onsite seed collection for habitat restoration in order to sustain the endemic flora that currently exists. In accordance with Mitigation Measures BIO-19 and BIO-20, long-term impacts to riparian and/or sensitive communities would be offset by onsite restoration of equivalent habitat quality and/or payment into a CDFW-approved mitigation bank. However, even with implementation of these mitigation measures, the proposed project would have a substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS. Potential impacts would be significant and unavoidable.

NASA Liquid Oxygen Plant (Impact 4.3-3b)

Table 4.3-10, indicates the various sensitive aquatic/riparian, and upland habitats that would be affected by soil removal and remediation activities within NASA's initial project area. The majority of the habitat that would be affected by remediation consists of chaparral and Venturan coastal sage scrub. The removal or disturbance of sensitive communities would result in the loss of nesting and/or foraging habitat for common and special-status bird and terrestrial species. Mitigation Measure BIO-5 would require restoration of native vegetation communities.

As previously discussed for the overall site cleanup, Mitigation Measure BIO-19 would ensure all areas subject to disturbance would be surveyed in accordance with CDFW methodology, and ensure potential impacts to sensitive habitats would be quantified and restored/mitigated. Mitigation Measure BIO-20 would require onsite seed collection to accumulate sufficient propagule material for the restoration of impacted native vegetation communities. However, since the exact sources of backfill are unknown at this time, and no more than 75 percent of excavated soil would be backfilled after soil removal, direct impacts to sensitive natural communities would be considered a permanent impact even with habitat restoration.

Conclusion: NASA's initial project would result in a permanent loss of riparian and sensitive natural communities despite implementation of habitat revegetation as required by Mitigation Measure BIO-5. In accordance with Mitigation Measures BIO-19 and BIO-20, long-term impacts to riparian and/or sensitive communities would be offset by onsite restoration of equivalent habitat quality and/or payment into a CDFW-approved mitigation bank. However, even with implementation of these mitigation measures, the proposed project would have a substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS. Potential impacts would be significant and unavoidable.

TABLE 4.3-10
NASA LOX AREA – SENSITIVE HABITAT IMPACTS

Vegetation Community or Land Cover Type	Rarity Ranking[1]	Acreage
Shrublands		
Chaparral	Unranked	5.4
Venturan Coastal Sage Scrub	G3S3.1/LI	2.8
Foothill Woodlands		
Coast Live Oak Woodland (Upland)	G4S4/LI	0.3
Riparian		
Coast Live Oak Riparian Woodland	G4S4/LI	1.3
Other Land Cover Types		
Rockoutcrop/Vegetated	Unranked	0.5
Total		**10.3**

SOURCE: ESA 2016.

Demolition Activities (Impact 4.3-3b)

The buildings that would be demolished in Area IV are all located within currently developed areas, which do not support any sensitive natural communities. As such, no impacts to sensitive natural communities would occur.

> Conclusion: Demolition activities would not have a substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS. No impact would occur, and no mitigation would be required.

RCRA Post-Closure and Hazardous Waste Facility Closure (Impact 4.3-3b)

As the buildings and other physical infrastructure associated with the RCRA Hazardous Waste Facility Closure are within currently disturbed or developed areas that do support sensitive natural communities, potential impacts would be the same as those discussed under the demolition activities, above. No impacts to sensitive habitats would occur.

> Conclusion: The RCRA Post-Closure and Hazardous Waste Facility Closure would not have a substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS. No impact would occur, and no mitigation would be required.

Areas I, II, and III Impoundment Post-Closure (Impact 4.3-3b)

The proposed activities associated with the impoundment permits would be limited to managing impoundments through monitoring and periodic maintenance of existing facilities. As no new construction is proposed as part of ongoing monitoring and maintenance activities, and activities

would be limited to currently disturbed or developed areas, no impacts to sensitive habitats would occur.

Conclusion: Ongoing maintenance activities related to the impoundment permit renewals would not have a substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS. No impacts would occur, and no mitigation would be required.

Impact 4.3-3b Determination: *Upon implementation of Mitigation Measures BIO-5, BIO-19 and BIO-20, impacts to riparian habitat or other sensitive natural communities from the* ***initial activities*** *would be significant and unavoidable.*

4.3.5.4. Protected Wetlands and Waters

Program Assessment

Impact 4.3-4a: Would the **overall site cleanup** have a substantial adverse effect on federally or state protected wetlands and waters through direct removal, filling, hydrological interruption, or other measures?

Overall Site Cleanup (Impact 4.3-4a)

Federally and/or state-protected wetlands and waters within the project site may include streams and drainages (i.e., riverine habitat), ponds/open water, seeps, vernal pools, marshes and other wetlands, and riparian vegetation. Impacts to these potential jurisdictional resources resulting from soil remediation activities include disturbance or loss of habitat, as well as alterations to site hydrology. Alterations to site hydrology would occur as a result of soil removal, grading along or near stream channels, and/or backfilling only up to 75 percent of excavated soils, which, in turn, would impact additional habitat areas offsite and/or downstream. As shown in **Table 4.3-11**, approximately 9.07 acres of jurisdictional wetland/waters habitat would be directly impacted. Additionally, as shown in Table 4.3-8, approximately 13.5 acres of riparian habitat (comprising coast live oak riparian woodland and southern willow scrub) would be directly impacted. Potentially jurisdictional wetlands and waters are shown in Figure 4.3-6, and Mitigation Measure BIO-21 would require avoidance of these features to the extent feasible, and require that permits be obtained from USACE, LARWQCB, and/or CDFW prior to impacts. In addition, Mitigation Measure BIO-21 would require compensatory mitigation for temporary and permanent impacts to jurisdictional wetlands and waters. However, since the exact sources of backfill are unknown at this time, and no more than 75 percent of excavated soil would be backfilled after soil removal, direct impacts to jurisdictional wetlands and waters would be considered a permanent impact even with compensatory mitigation.

TABLE 4.3-11
OVERALL SITE CLEANUP – POTENTIAL IMPACTS TO JURISDICTIONAL WETLANDS AND WATERS SUBJECT TO CLEAN WATER ACT

Feature ID	Impacts to Potential Waters of the U.S./State (acres)
Area I (Boeing), Area III, and Southern Undeveloped Area	
Palustrine Wetlands	
R-1 Pond[1]	1.06
Perimeter Pond	0.73
Silvernale Pond[1]	1.83
Total Palustrine Wetlands	***3.62***
Riverine	
Drainages/seeps	2.20
Total Riverine Wetlands	***2.20***
Total	**5.82**
Area I (NASA) and Area II	
Palustrine Wetlands	
R2A Pond	0.74
R2B Pond	0.13
Coca Skim Pond	0.33
Total Palustrine Wetlands	***1.20***
Riverine[2]	
Drainages	0.62
Total Riverine Wetlands	**0.62**
Total	**1.82**
Area IV and Northern Undeveloped Area	
Palustrine Wetlands	
Vernal Pool 2	0.009
Million Dollar Hole	0.179
Total Palustrine Wetlands	***0.19***
Riverine	
Ephemeral Drainages	1.24
Total Riverine Wetlands	**1.24**
Total Potential Waters of the U.S./State in Area IV and Northern Undeveloped Area	**1.43**
Total Impacts to Potential Waters of the U.S./State in SSFL	**9.07**

SOURCE: Boeing, 2016; NASA, 2015; DOE, 2016.

Indirect impacts to aquatic and riparian habitats would potentially occur as a result of groundwater remediation activities. Pumping of groundwater for treatment would lower the existing groundwater table and thus possibly reduce the current available groundwater supply that may support (at least in part) aquatic and riparian habitats, as well as some upland plant species. The Groundwater Extraction Treatment System (GETS) would discharge treated water from Boeing and NASA to Outfalls 019 and 020, or inject it back into the Chatsworth Formation aquifer. If the treated water is injected back into the aquifer, the groundwater supply would remain unchanged; thus potential impacts to aquatic and riparian habitats would be less than significant. However, aquatic (i.e., seeps) and riparian habitats located in or near the groundwater plumes identified for remediation would, to some extent, rely on current groundwater sources. Therefore, if this groundwater source is pumped out of the aquifer for treatment and discharged into one of the outfalls (and not reinjected back into the aquifer), aquatic and riparian habitats could be impacted as a result of reduced groundwater supply and/or soil moisture. Limited areas of riverine, open water, wetland, coast live oak riparian woodland, and southern willow scrub occur over known groundwater plumes, and impacts to these federally and/or state-protected habitats could be potentially significant.

As discussed in Section 4.8.5.2, *Groundwater Supplies,* of this PEIR, groundwater pumping rates for extraction would be determined based on modeling and observed conditions with the goal of establishing a cone of depression in order to create a zone of capture to contain groundwater with contaminants above the cleanup requirements. Pumping rates would be monitored and set at levels that do not decrease groundwater levels to below the tops of well screens or pump intakes and cause cavitation that would damage the pumps. In addition, injection of treated groundwater back into the aquifer, if approved by the LARWQCB, would assist in recharging the groundwater, ensuring that regional groundwater supplies are not substantially depleted. Once the cleanup requirements are reached, the groundwater extraction system(s) would be removed and groundwater pumping terminated, which would allow groundwater levels to return to natural, pre-pumping levels. Therefore, there would be minimal net deficit in aquifer volume or lowering of the local groundwater table. During the permitting process, any indirect effects to sensitive habitats resulting from temporary groundwater impacts would be taken into consideration when determining compensatory mitigation during the permitting process, as required by Mitigation Measure BIO-21.

Indirect impacts to jurisdictional habitats would also result from the spread of noxious weeds by equipment and vehicles; however, Mitigation Measure BIO-4 would require implementation of a weed management plan to minimize such effects. In addition, drilling muds can be hazardous to wildlife and jurisdictional wetlands or waters if the mud reaches stream channels; however, the installation of the treated water injection well or soil vapor wells would not use mud rotary drilling methods since the mud would clog up the aquifer pore spaces and restrict injection. Therefore, no indirect impacts to wildlife or jurisdictional wetlands or waters resulting from the use of drilling muds would occur.

> Conclusion: Implementation of Mitigation Measure BIO-4 would minimize the spread of noxious weeds to jurisdictional habitats that would occur as a result of vehicles and heavy

machinery transporting materials. Implementation of Mitigation Measure BIO-21 would require obtaining permits and implementing compensatory mitigation to offset temporary and permanent impacts to jurisdictional wetlands and waters. However, overall site cleanup activities would have a substantial adverse effect on federally or state protected wetlands and waters. Potential impacts would be significant and unavoidable.

Impact 4.3-4a Determination: *Upon implementation of Mitigation Measures BIO-4 and BIO-21, impacts to federally or state protected wetlands and waters from* ***overall site cleanup*** *would be* ***significant and unavoidable****.*

Initial Project Assessment

Impact 4.3-4b: Would the **initial activities** have a substantial adverse effect on federally or state protected wetlands and waters through direct removal, filling, hydrological interruption, or other measures?

DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal (Impact 4.3-4b)

Potential impacts to jurisdictional wetlands or waters resulting from initial soil remediation activities would be similar to those described for the overall site cleanup. No groundwater remediation is proposed under this initial project; therefore, there would be no indirect impacts to potentially jurisdictional habitats. As shown in Table 4.3-9, approximately 0.1 acre of coast live oak riparian woodland would be directly impacted. Within DOE's initial project area, approximately 0.13 acre of impacts to jurisdictional waters would occur, and no impacts to jurisdictional wetlands (including vernal pools) are anticipated. However, as discussed above for the overall site cleanup, Mitigation Measures BIO-4 and BIO-21 would avoid or reduce impacts to jurisdictional habitats and require compensatory mitigation for any unavoidable impacts.

Conclusion: Implementation of Mitigation Measure BIO-4 would minimize the spread of noxious weeds to jurisdictional habitats that would occur as a result of vehicles and heavy machinery transporting materials. Implementation of Mitigation Measure BIO-21 would require obtaining permits and implementing compensatory mitigation for temporary and permanent impacts to jurisdictional wetlands and waters. Therefore, Area IV initial soil removal activities would not have a substantial adverse effect on federally or state protected wetlands and waters. Potential impacts would be less than significant with mitigation.

NASA Liquid Oxygen Plant (Impact 4.3-4b)

Potential impacts to jurisdictional wetlands or waters resulting from soil remediation would be similar to those described for the overall site cleanup, and would result in no impacts to jurisdictional wetlands and 0.11 acre of impacts to jurisdictional waters. No groundwater remediation is proposed under this initial project; therefore, there would be no indirect impacts to potentially jurisdictional habitats. As shown in Table 4.3-10, approximately 1.3 acres of coast live oak riparian woodland would be directly impacted during NASA's initial project. However, as

discussed above for the overall site cleanup, Mitigation Measures BIO-4 and BIO-21 would avoid or reduce impacts to jurisdictional habitats and require compensatory mitigation for any unavoidable impacts.

> Conclusion: Implementation of Mitigation Measure BIO-4 would minimize the spread of noxious weeds to jurisdictional habitats that would occur as a result of vehicles and heavy machinery transporting materials. Implementation of Mitigation Measure BIO-21 would require obtaining permits and implementing compensatory mitigation for temporary and permanent impacts to jurisdictional wetlands and waters. Therefore, remediation of NASA's initial project would not have a substantial adverse effect on federally or state protected wetlands and waters. Potential impacts would be less than significant with mitigation.

Demolition Activities (Impact 4.3-4b)

The buildings that would be demolished in Area IV are located within currently developed areas, which do not support any jurisdictional wetlands or waters. As such, no direct impacts to jurisdictional features would occur.

> Conclusion: Demolition activities would not have a substantial adverse effect on federally or state protected wetlands or waters. No impact would occur, and no mitigation would be required.

RCRA Post-Closure and Hazardous Waste Facility Closure (Impact 4.3-4b)

As the buildings and other physical infrastructure associated with the RCRA Hazardous Waste Facility Closure are located within currently disturbed or developed areas that do support jurisdictional habitats, potential impacts would be the same as those discussed for the demolition activities, above.

> Conclusion: The RCRA Post-Closure and Hazardous Waste Facility Closure would not have a substantial adverse effect on federally or state protected wetlands or waters. No impact would occur, and no mitigation would be required.

Areas I/ III Impoundment Post-Closure (Impact 4.3-4b)

The proposed activities associated with the impoundment monitoring and maintenance would be limited to managing impoundments through monitoring and periodic maintenance of existing facilities. As no new construction is proposed as part of ongoing monitoring and maintenance activities and actions would be limited to currently disturbed or developed areas, no impacts to jurisdictional wetlands or waters would occur.

> Conclusion: Ongoing monitoring and maintenance activities related to the impoundment permits would not have a substantial adverse effect on federally or state protected wetlands and waters. No impact would occur, and no mitigation would be required.

Impact 4.3-4b Determination: *Upon implementation of Mitigation Measures BIO-4 and BIO-21, impacts to federally or state protected wetlands and waters from the* ***initial activities*** *would be* ***less than significant****.*

4.3.5.5. Fish or Wildlife Movement Corridors and Nursery Sites

Program Assessment

Impact 4.3-5a: Would the **overall site cleanup** interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Overall Site Cleanup (Impact 4.3-5a)

As discussed in Section 4.3.1, *Environmental Setting, Wildlife Migration, and Movement Corridors*, the project site provides local and regional opportunities for wildlife to reside, forage, disperse, and migrate between habitats. Native habitat areas within or in proximity to the proposed remediation areas play an important role as a wildlife migration corridor, connecting habitat areas throughout the Simi Hills. Developed portions of the project site exhibit some barriers to wildlife movement such as fencing, infrastructure, and asphalt areas. Wildlife tracks have been frequently observed on unpaved access roads throughout the project site and at Sage Ranch Park, suggesting that wildlife use these areas for foraging and movement (Padre, 2013). As shown in Figure 4.3-3, the eastern and southern portions of the project site are located within the eastern strand of the Santa Monica-Sierra Madre Landscape Linkage, a wildlife migration corridor that connects large habitat areas between the Sierra Madre Range to the north and the Santa Monica Mountains to the south. Within the project site, the linkage is located within Area I and the Southern Undeveloped Area, which is comprised of a variety of native habitat types including coastal sage scrub, chaparral, and ponds and streams that provide nesting, foraging, and dispersal opportunities, particularly for resident and migratory fowl, and various endemic mammals and reptiles. Terrestrial wildlife that have been documented gaining passage under US 101 (at the Liberty Canyon underpass), SR 23, and/or SR 118 include mountain lions, black bears, deer mice, woodrats, ground squirrels, cottontail rabbits, skunks, raccoons, coyotes, bobcats, and mule deer, all of which have been observed at the project site (County of Ventura, 2005; Padre, 2013).

There are no records that indicate there are wildlife nursery sites at the proposed remediation areas. Because there are no perennial creeks or streams in the project site, there are no corridors for fish passage present. The excavation of soils within terrestrial and aquatic habitats (and dewatering of ponds and other aquatic features) have the potential for disturbance or mortality of resident or migratory birds, amphibians, invertebrates and some reptiles (i.e., two-striped garter snake) during excavation or remediation activities, which would result in significant impacts if they were to occur during breeding periods or migratory stopovers. Waterbirds that have been observed at the project site by Padre Associates or SFVAS include red-winged blackbird, killdeer, great blue heron, American white pelican, great egret, double-crested cormorant, and

others. Of these birds, the American white pelican and great egret are migratory species that winter in the region, while the others are known to be year-round residents. Mitigation Measure BIO-16 requires avoidance of migratory nesting birds and raptors and their nests when cleanup activities would be conducted during the nesting bird season, and would reduce potential impacts to less-than-significant levels.

As the project access routes traverse areas identified as a local and regional wildlife movement corridor, long-term impacts to terrestrial wildlife and wildlife movement would occur as a result of roadkill associated with the substantial increase in traffic on local roads to and from the project site, as well as within the proposed remediation areas. This would be a potentially significant impact. Mitigation Measures BIO-12 and BIO-22 provide measures to minimize direct impacts on special-status wildlife species, including terrestrial or migratory bird species, during soil and ground water cleanup operations and requires biological monitoring prior to and during ground disturbance to avoid and minimize harm to wildlife encountered, which may include allowing wildlife to passively leave the work area without harm, or active relocation (i.e., trap and release) of non-listed wildlife species of low mobility that would be killed or injured by grubbing or ongoing remediation activities. However, relocation would not be allowed for any listed species without first obtaining take authorization from USFWS and/or CDFW, in accordance with Mitigation Measure BIO-12. This mitigation measure would minimize mortality of migrating animals during soil and ground water cleanup operations. Further, work areas would not block or restrict access to all open space areas used for wildlife movement, as wildlife would be able to pass through the work area and adjacent areas would also be utilized for wildlife movement. Therefore, potential impacts would be less than significant.

> Conclusion: Implementation of Mitigation Measures BIO-12, BIO-16 and BIO-22 would minimize impacts to wildlife movement that would occur as a result of proposed remediation activities. The overall site cleanup would not substantially interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. Potential impacts would be less than significant with mitigation.

Impact 4.3-5a Determination: *Upon implementation of Mitigation Measures BIO-12, BIO-16, and BIO-22, impacts to wildlife movement from the* ***overall site cleanup*** *would be* ***less than significant****.*

Initial Project Assessment

Impact 4.3-5b: Would the **initial activities** interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal (Impact 4.3-5b)

Potential project impacts to native wildlife movement and migratory wildlife corridors in DOE's initial project area would be similar to those previously described for the overall site cleanup. While DOE's initial project is not located within a known migration corridor, potential impacts from soil removal would hinder localized terrestrial wildlife movement and/or result in the temporary loss of habitat for birds that winter or migrate through the area. Mitigation Measures BIO-16 and BIO-22 would also apply to DOE's initial project to reduce potential impacts to wildlife movement to less-than-significant levels.

> Conclusion: Implementation of Mitigation Measure BIO-16 and BIO-22 would minimize impacts to wildlife movement as a result of DOE's initial remediation activities. Therefore, Area IV initial soil removal activities would not substantially interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. Potential impacts would be less than significant with mitigation.

NASA Liquid Oxygen Plant (Impact 4.3-5b)

Potential project impacts to native wildlife movement and migratory wildlife corridors in NASA's initial project would be similar to those previously described for DOE. While NASA's initial project is not located within a known migration corridor, potential impacts from soil removal would hinder localized terrestrial wildlife movement and/or result in the temporary loss of habitat for birds that winter or migrate through the area. Mitigation Measures BIO-16 and BIO-22 would also apply to NASA's initial project to reduce potential impacts to wildlife movement to less-than-significant levels.

> Conclusion: Implementation of Mitigation Measures BIO-16 and BIO-22 would minimize impacts to wildlife movement as a result of NASA's initial remediation activities, including vehicles and heavy machinery transporting materials. Therefore, remediation of NASA's initial project would not substantially interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. Potential impacts would be less than significant with mitigation.

Demolition Activities (Impact 4.3-5b)

DOE buildings proposed for demolition are not located within a known migration corridor; however, this infrastructure would provide suitable habitat for nesting resident and migratory birds. Building demolition would hinder localized terrestrial wildlife movement or result in injury or mortality of juvenile birds, removal of active nests, and/or nest failure. Mitigation Measures BIO-16 and BIO-22 would also apply to demolition activities to reduce potential impacts to wildlife movement to less-than-significant levels.

> Conclusion: Implementation of Mitigation Measures BIO-16 and BIO-22 would minimize impacts to wildlife movement as a result of proposed remediation activities, including vehicles and heavy machinery transporting materials. Therefore, building

demolition would not substantially interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. Potential impacts would be less than significant with mitigation.

RCRA Post-Closure and Hazardous Waste Facility Closure (Impact 4.3-5b)

The buildings and other physical infrastructure associated with the RCRA Post-Closure and Hazardous Waste Facility Closure are located within currently disturbed or developed areas in Area I, within the eastern strand of the Santa Monica-Sierra Madre Landscape Linkage, a known migration corridor. Potential project impacts to native wildlife movement and migratory wildlife corridors would be similar to those previously described for the overall site cleanup. Mitigation measures identified in the overall site cleanup would also apply to this project to reduce potential impacts to wildlife movement to less-than-significant levels.

Conclusion: Implementation of Mitigation Measures BIO-12, BIO-16, and BIO-22 would minimize impacts to wildlife movement as a result of proposed remediation activities, including vehicles and heavy machinery transporting materials. Therefore, the RCRA Post-Closure Monitoring and Maintenance and Hazardous Waste Facility Closure would not substantially interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. Potential impacts would be less than significant with mitigation.

Areas I, II, and III Impoundment Post-Closure (Impact 4.3-5b)

The historical surface impoundments provide suitable habitat for nesting resident and migratory birds. One existing impoundment is located in Area I, which is within the eastern strand of the Santa Monica-Sierra Madre Landscape Linkage, a known migration corridor. Maintenance activities would result in injury or mortality of juvenile birds, removal of active nests, and/or nest failure. In addition, terrestrial wildlife would be encountered by workers during monitoring or maintenance.

Mitigation Measure BIO-16 requires avoidance of nesting birds (including migratory birds) and raptors and their nests during the nesting bird season; and Mitigation Measure BIO-22 provides measures to avoid harm to terrestrial wildlife encountered and minimize roadkill. These mitigation measures would minimize mortality of migrating animals during ongoing maintenance; therefore, potential impacts would be less than significant.

Conclusion: Mitigation Measures BIO-16 and BIO-22 would minimize impacts to wildlife movement as a result of proposed remediation activities, including vehicles and heavy machinery transporting materials. Therefore, the ongoing monitoring and maintenance associated with Areas I and III Impoundment Post-Closure would not substantially interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or

impede the use of native wildlife nursery sites. Potential impacts would be less than significant with mitigation.

Impact 4.3-5b Determination: *Upon implementation of Mitigation Measures BIO-12, BIO-16, and BIO-22, impacts to wildlife movement from the* ***initial activities*** *would be* ***less than significant****.*

4.3.5.6. Local Policies or Ordinances

Program Assessment

Impact 4.3-6a: Would the **overall site cleanup** conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or locally important species or communities?

Overall Site Cleanup (Impact 4.3-6a)

Potential construction-related impacts associated with soil excavation and remediation activities would conflict with local goals, objectives and policies that include the Ventura County Tree Protection Ordinance, Ventura County Oak Woodlands Management Plan, and the Ventura County General Plan.

Potential impacts to protected trees would include tree removal, trimming, or grading/excavating within the root zone, which are regulated activities under the Ventura County Tree Protection Ordinance. Tree removal would result in a permanent impact, while trimming or disturbance within the tree's protective zone would be considered a temporary impact. Mitigation Measure BIO-23 identifies preservation and protection measures for trees protected by the ordinance, including oak, sycamore, historical and heritage trees (i.e., protected trees) that are located within or adjacent to remediation areas. Mitigation Measure BIO-23 also requires preparation of a Tree Management and Preservation Plan that would outline the tree preservation and monitoring requirements, and require protected trees be maintained and monitored by the RPs until the trees are considered by an arborist to be self-sustaining. Protective measures include installation of fencing and retaining walls outside of the root zone, and placement of fill, equipment, or grading would be prohibited within the dripline. In addition, impacts to oak woodlands would be mitigated as required by Mitigation Measure BIO-19.

The Ventura County General Plan Resources Element Goal 1.5.1 identifies policies for the protection of significant biological resources, including endangered, threatened or rare species and their habitats, wetland habitats, wildlife migration corridors and locally important species/communities. As previously discussed, the overall site cleanup would implement Mitigation Measures BIO-1 through BIO-22. These measures, along with Mitigation Measure BIO-23, would reduce potential impacts to significant biological resources, as identified by County policies, to less than significant. However, as discussed above, since a BO has not yet been issued by USFWS, DTSC has not determined specifically where to apply an AOC exception to protect resources. DTSC will make any exception determinations during review of the various

cleanup decision documents. Therefore, for purposes of this analysis and making a significance determination, it is assumed that the AOC exception would not be applied. Therefore, potential conflicts with local policies or ordinances would be significant and unavoidable.

> Conclusion: Implementation of Mitigation Measures BIO-1 through BIO-23 would minimize impacts to sensitive biological resources that would occur as a result of proposed remediation activities. However, DTSC has not yet determined whether to apply AOC exceptions to protect biological resources. Therefore, the overall site cleanup would conflict with any local policies or ordinances protecting biological resources. Potential impacts would be significant and unavoidable.

Impact 4.3-6a Determination: *Upon implementation of Mitigation Measures BIO-1 through BIO-23, potential conflicts with local policies or ordinances from* ***overall site cleanup*** *would be* ***significant and unavoidable****.*

Initial Project Assessment

Impact 4.3-6b: Would the **initial activities** conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or locally important species or communities?

DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal (Impact 4.3.6b)

Local plans and policies discussed for the overall site cleanup also apply to DOE's initial project. As identified previously in the impact analyses for DOE's initial project, soil removal activities would implement Mitigation Measures BIO-1 through BIO-10, and BIO-12 through BIO-22. As discussed in the overall site cleanup, Mitigation Measure BIO-23 would ensure protection of locally protected trees and would also apply to DOE's initial project. However, as complete avoidance is not possible due to the extent of soils above LUT values in Area IV, soil removal associated with DOE's initial project would have a substantial adverse effect on biological resources. Therefore, potential conflicts with local policies or ordinances would be significant and unavoidable.

> Conclusion: Implementation of Mitigation Measures BIO-1 through BIO-10, and BIO-12 through BIO-23 would minimize impacts to sensitive biological resources that would occur as a result of soil removal. However, as complete avoidance is not possible due to the extent of soils above LUT values in Area IV, soil removal associated with DOE's initial project would have a substantial adverse effect on biological resources. Therefore, radioactive soil removal within DOE's initial project would conflict with any local policies or ordinances protecting biological resources. Potential impacts would be significant and unavoidable.

NASA Liquid Oxygen Plant (Impact 4.3.6b)

Local plans and policies discussed for the overall site cleanup also apply to NASA's initial project. As identified previously in the impact analyses for NASA's initial project, soil removal activities would implement Mitigation Measures BIO-1 through BIO-10, and BIO-12 through BIO-22. As discussed in the overall site cleanup, Mitigation Measure BIO-23 would ensure protection of locally protected trees and would also apply to NASA's initial project. Therefore, potential conflicts with local policies or ordinances would be less than significant.

> Conclusion: Implementation of Mitigation Measures BIO-1 through BIO-10, and BIO-12 through BIO-23 would minimize impacts to sensitive biological resources that would occur as a result of soil removal. Therefore, soil removal within NASA's initial project would not conflict with any local policies or ordinances protecting biological resources. Potential impacts would be less than significant with mitigation.

Demolition Activities (Impact 4.3.6b)

Demolition activities would not directly impact protected trees or sensitive habitats (including oak woodlands) since they would occur within currently disturbed or developed areas. As previously discussed, demolition activities would implement Mitigation Measures BIO-2, BIO-12, BIO-16, BIO-18, and BIO-22. These measures would reduce potential impacts to other significant biological resources, such as nesting birds and roosting bats, to less than significant. Therefore, potential conflicts with local policies or ordinances would be less than significant.

> Conclusion: Implementation of Mitigation Measures BIO-2, BIO-12, BIO-16, BIO-18 and BIO-22 would minimize impacts to sensitive biological resources that would occur as a result of building demolition. Therefore, building demolition would not conflict with any local policies or ordinances protecting biological resources. Potential impacts would be less than significant with mitigation.

RCRA Post-Closure and Hazardous Waste Facility Closure (Impact 4.3.6b)

Demolition activities associated with the RCRA Post-Closure and Hazardous Waste Facility Closure would not directly impact protected trees or sensitive habitats (including oak woodlands) since they would occur in currently disturbed or developed areas. The demolition activities would implement Mitigation Measures BIO-2, BIO-12, BIO-16, BIO-18, and BIO-22. These measures would reduce potential impacts to other significant biological resources, such as nesting birds and roosting bats, to less than significant. Therefore, potential conflicts with local policies or ordinances would be less than significant.

> Conclusion: Implementation of Mitigation Measures BIO-2, BIO-12, BIO-16, BIO-18, and BIO-22 would minimize impacts to sensitive biological resources that would occur as a result of demolition. Therefore, demolition associated with the RCRA Post-Closure and Hazardous Waste Facility Closure would not conflict with any local policies or ordinances protecting biological resources. Potential impacts would be less than significant with mitigation.

Areas I, II, and III Impoundment Post-Closure (Impact 4.3.6b)

Ongoing maintenance activities of Areas I and III impoundments would not directly impact protected trees or sensitive habitats (including oak woodlands) since they would occur within currently developed areas. Mitigation Measures BIO-2, BIO-12, BIO-16, and BIO-22 would be implemented, and would reduce potential impacts to other significant biological resources, such as nesting birds, to less than significant. Therefore, potential conflicts with local policies or ordinances would be less than significant.

Conclusion: Implementation of Mitigation Measures BIO-2, BIO-12, BIO-16, and BIO-22 would minimize impacts to sensitive biological resources that would occur as a result of maintenance activities. Therefore, ongoing maintenance of Areas I and III impoundments would not conflict with any local policies or ordinances protecting biological resources. Potential impacts would be less than significant with mitigation.

Impact 4.3-6b Determination: *Upon implementation of Mitigation Measures BIO-1 through BIO-10, and BIO-12 through BIO-23, potential conflicts with local policies or ordinances from* ***initial activities*** *would be* ***significant and unavoidable****.*

4.3.5.7. Conservation and Habitat Plans

Program and Initial Project Assessment

Impact 4.3-7: Would the **overall site cleanup** and **initial activities** conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?

The project site is not located within an adopted or approved habitat conservation plan or natural community conservation plan. The Los Angeles County Santa Susana Mountains/Simi Hills Significant Ecological Area (SEA) is located to the east of the project site (County of Los Angeles 2015). However, the project site is not located within the Los Angeles County SEA. Therefore, the project would have no impact related to conflicts with the provisions of an adopted or approved habitat conservation or natural community conservation plan.

Impact 4.3-7 Determination: *The* ***overall site cleanup*** *and* ***initial activities*** *would not conflict with an adopted or approved habitat conservation or natural community conservation plan. No impact would occur.*

4.3.6 Mitigation Measures

The following measures shall be implemented to mitigate impacts related to biological resources:

BIO-1: Critical Habitat and Listed Species Avoidance. Remediation activities in critical habitat or containing state and federally listed species shall be minimized to the extent practicable and consistent with applicable laws. A USFWS and CDFW-approved

biologist[6] shall be onsite to monitor any ground-disturbing activities within critical habitat or occupied habitat for listed species.

For areas where an AOC exception is applied and critical habitat or habitat for listed species are avoided, the following mitigation shall be required:

- Federal- and state-listed plant species and critical habitat shall be flagged for avoidance within and near work zones and a suitable no-disturbance buffer established. The appropriate buffer distance shall be determined by the USFWS-approved biologist and the avoidance area shall be periodically monitored.
- If a federal- or state-listed animal species is identified during work activities, work shall halt until the biologist determines appropriate actions to avoid and minimize harm to the species. Federally-listed wildlife species shall not be handled or relocated without first obtaining take authorization from USFWS. USFWS shall be consulted to determine an appropriate response. State-listed wildlife species shall not be pursued, handled, relocated, or killed without first providing information about the activity to CDFW to its satisfaction so that it may assess the impact on the state-listed wildlife. Any conditions that CDFW requires after assessing the information shall be implemented when conducting the work activities and such conditions may include avoidance, minimization, and mitigation measures, and applying for and receiving an incidental take permit.

If an AOC exception is not applied, and where remedial activity is required in critical habitat or habitat for listed species, the following mitigation is required:

- USFWS and CDFW shall be consulted prior to the start of any work activities within critical habitat, occupied habitat, or disturbance or removal of a listed plant species.
- Work zones shall be monitored for the presence of listed species prior to and periodically during work activities by a CDFW-approved biologist or botanist.
- If a federal-listed animal species is identified during work activities, work shall halt until the biologist determines appropriate actions to avoid and minimize harm to the species. Federal-listed wildlife species shall not be handled or relocated without first obtaining take authorization from USFWS. USFWS shall be consulted to determine an appropriate response.
- State-listed wildlife species shall not be pursued, handled, relocated, or killed without first providing information about the activity to CDFW to its satisfaction, so that it may assess the impact on state-listed wildlife. Any conditions that CDFW requires after assessing the information shall be implemented when conducting the work activities and such conditions may include avoidance/minimization measures, applying for and receiving an incidental take permit, as well as implementing requirements of the incidental take permit.

[6] A "USFWS-approved biologist/botanist" is one who is approved by USFWS for performing worker environmental awareness training, biological monitoring, or certain types of biological surveys for species protected under the Federal Endangered Species Act. A "CDFW-approved botanist/biologist" is one who is approved by CDFW for performing worker environmental awareness training, biological monitoring, or certain types of biological surveys for flora or fauna native to California, including species protected under the California Endangered Species Act.

BIO-2: Worker Environmental Awareness Program Training. Prior to the start of construction, the RPs, under the direction of DTSC, shall retain a USFWS and CDFW-approved biologist to provide Worker Environmental Awareness Program (WEAP) Training to all construction workers onsite. The training shall include materials to aid workers in identifying sensitive habitats, plants, and wildlife that should be avoided; applicable laws and regulations protecting such resources; and proper avoidance and communication procedures to protect sensitive biological resources, as well as common wildlife whenever possible.

BIO-3: Braunton's Milk-Vetch. Prior to vegetation or ground disturbance within areas affected by cleanup activities and suitable habitat where Braunton's milk-vetch have not been previously documented, focused surveys for Braunton's milk-vetch shall be conducted by a USFWS and CDFW-approved botanist/biologist, retained by the RPs, under the direction of DTSC. The focused surveys shall be conducted within 1 year prior to vegetation or ground disturbance and during the appropriate blooming period (January through August). During the focused surveys, individual plants detected shall be flagged by the botanist/biologist, and these areas of occupied habitat shall be considered for an AOC exception.

For areas where the AOC exception is applied and Braunton's milk-vetch plants and critical habitat are avoided, the following mitigation is required:

- Prior to vegetation or ground disturbance, a USFWS and CDFW-approved botanist/biologist shall delineate critical habitat and Braunton's milk-vetch occupied habitat for avoidance.

If an AOC exception is not applied, and where remedial activity would result in disturbance or removal of Braunton's milk-vetch plants or its critical habitat, the following mitigation is required:

- Prior to vegetation or ground disturbance to Braunton's milk-vetch occupied habitat or critical habitat, a conservation plan shall be developed in consultation with USFWS and CDFW to protect this species, which shall identify effective conservation strategies that may include erecting fencing to prevent herbivory effects and insect pollinator habitat requirements. Recovery criteria for Braunton's milk-vetch identified in the *Recovery Plan for Six Plants from the Mountains Surrounding the Los Angeles Basin* (1999) shall be considered and included, as appropriate, in the preparation of the conservation plan, in consultation with USFWS.
- During vegetation or ground disturbance associated with remediation activities, clean topsoil shall be salvaged for reuse as appropriate and approved biological monitor shall be onsite to make sure work is conducted within areas of occupied/critical habitat previously authorized by USFWS through its Biological Opinion.
- Conservation measures and biological reporting related to Braunton's milk-vetch as identified in the USFWS's Biological Opinion for the proposed remediation activities shall be implemented.

BIO-4: Weed Management Plan. Prior to any ground disturbing activities, the RPs under the direction of DTSC, shall prepare a Weed Management Plan for CDFW approval to prevent introduction of noxious and invasive species onsite, confirm and document that construction equipment is visually free of weeds and soil prior to bringing onsite, confirm backfill is free of invasive plant species, and ensure revegetation seed mixtures are free of noxious or invasive species.

BIO-5: Revegetation Plan. Prior to any ground disturbances, a site-specific revegetation plan shall be prepared by a qualified restoration ecologist, retained by the RPs and approved by CDFW, that includes a description of existing conditions for each area, disturbances, compensation mitigation, site preparation, revegetation methods, maintenance and monitoring criteria, performance standards, and adaptive management practices. Appropriate restoration measures shall be prescribed based on site location, slope, and remoteness. The plan shall identify cover standards that shall be developed for each plant community target, and cover values established for each layer (i.e., herb, shrub, and/or tree layers). The plan shall identify the quantity and quality of habitats to be restored onsite; distinguish micro-habitat requirements for specific native habitats to be restored including soil, moisture, nutrient and pH requirements, and topographic requirements such as aspect and slope; and identify micro-habitat requirements for sensitive wildlife species (i.e., woody material).

The amount and extent of habitat revegetation shall be identified in the revegetation plan and shall be determined based on habitat quality and through coordination with CDFW prior to the initiation of any ground disturbance. Restoration shall incorporate the use of a native seed mix approved by CDFW, and soil stabilization BMPs shall be incorporated to help in the reseeding success, including soil binders, erosion mats, and erosion control check dams, which shall be used in accordance with the Stormwater Pollution Prevention Plan. The plan shall require that any large boulders removed during cleanup be replaced in a similar layout as existing conditions to retain the natural character of the area. Appropriate restoration measures, goals, and monitoring requirements shall be included in the plan based on site location, slope, and remoteness, and shall be specified on all CDFW-approved construction plans.

The revegetation plan shall require that clean topsoil be stored for revegetation purposes; however, large stockpiles of clean topsoil shall be discouraged as this can negatively impact favorable soil properties, such as, but not limited to a reduction of organic matter (e.g., erosion, leaching, decomposition, dilution through soil horizon mixing), microbial biomass, bulk density, water holding capacity, and viable seed populations. The revegetation plan shall identify reseeding techniques that are appropriate for specific locations within the SSFL site, such as reseeding by drilling, broadcast, or hydro seeding techniques, and shall specify any soil amendments that may be needed based on the soil composition, including pH and nutrient content. The plan shall identify the timing of initial seed application following soil and slope stabilization activities, followed by a

secondary application prior to the onset of winter rains, and the plan shall require that reseeding consist of seed collected from the SSFL site and/or immediate area.

Lastly, the revegetation plan must include the proposed timetable for implementing the restoration, including, site preparation, establishment of diverse plant species, maintenance, and additional enhancement to establish the restoration, including adaptive management strategies. It shall identify performance standards and long-term maintenance and management needs of the restoration, responsible parties, and funding mechanism.

BIO-6: Special-Status Plants. Focused surveys for special-status vascular plants and non-vascular plants (i.e., moss and bryophytes) shall be conducted by a USFWS and CDFW-approved botanist/biologist retained by the RPs, under direction of DTSC, prior to ground disturbance within suitable habitat affected by soil remediation activities. The following special-status plant species would potentially be affected: Malibu baccharis, Catalina mariposa lily, slender mariposa lily, Plummer's mariposa lily, western spleenwort, Brewer's calandrinia, round-leaved filaree, club-haired mariposa lily, late-flowered mariposa lily, Peirson's morning-glory, Lewis' evening-primrose, Island mountain-mahogany, San Fernando Valley spineflower, Parry's spineflower, small-flowered morning-glory, crowned forget-me-not, Norris' beard moss, slender-horned spineflower, trask yerba santa, Palmer's grapplinghook, vernal barley, mesa horkelia, decumbent goldenbush, tiny poppy, white-veined monardella, Ojai navarretia, chaparral nolina, Lyon's pentachaeta, hubby's phacelia, south coast branching phacelia, California screw moss, and Ventura County Locally Important Plants. The focused surveys shall be consistent with CDFW 2009 protocols, and conducted within 3 years prior to initial vegetation or ground disturbance during the appropriate blooming periods. Focused plant surveys shall not be required if valid plant surveys have been conducted within suitable habitat for these species and were completed within 3 years of initial vegetation or ground disturbance. During the focused surveys, individual special-status plants that are detected shall be marked or flagged for avoidance to the extent feasible.

If it is anticipated that individual plants cannot be avoided, coordination with CDFW shall occur prior to disturbance to determine if species-specific mitigation is necessary. Depending on the sensitivity of the species, relocation, seed collection, habitat restoration (i.e., revegetation of suitable habitat), or other habitat improvement actions shall be identified in communication with CDFW to mitigate for unavoidable impacts. In addition, during vegetation or ground disturbance associated with remediation activities, a CDFW-approved biological monitor shall be onsite to establish avoidance areas and track any impacts to individual special-status plants.

BIO-7: Santa Susana Tarplant. Prior to ground disturbance, focused surveys for Santa Susana tarplant shall be conducted by a CDFW-approved botanist/biologist, retained by the RPs under the direction of DTSC, within suitable habitat affected by soil remediation activities. The focused surveys shall be conducted within 3 years prior to initial vegetation or ground disturbance and during the appropriate blooming period. Focused plant surveys shall not be required if valid plant surveys have been conducted within suitable habitat for this species and were completed within 3 years of initial vegetation or ground disturbance. During the focused surveys, individual plants detected shall be marked or flagged for avoidance to the extent feasible, and a suitable no-

disturbance buffer established. The appropriate buffer distance shall be determined by the CDFW-approved botanist/biologist.

For areas where an AOC exception is applied and Santa Susana tarplants are avoided, the following mitigation shall be required.

- Prior to vegetation or ground disturbance, a CDFW-approved botanist/biologist shall delineate Santa Susana tarplant occupied habitat for avoidance.

If an AOC exception is not applied, and where remedial activity would result in disturbance or removal of Santa Susana tarplants, the following mitigation is required:

- Prior to conducting any remedial activities, information about the remedial activity shall be provided to CDFW to its satisfaction so that it may assess the impact on the Santa Susana tarplant. Any conditions that CDFW requires after assessing the information shall be implemented when conducting the remedial activity and such conditions may include avoidance, minimization, and mitigation measures, and applying for and receiving an incidental take permit.
- A CDFW-approved biologist shall determine the number of individual Santa Susana tarplants that would be impacted prior to and ground-disturbance activities.
- Prior to vegetation or ground disturbance to Santa Susana tarplant occupied habitat, a draft Santa Susana Tarplant Restoration Plan shall be prepared and submitted to CDFW for review and approval prior to any vegetation or ground disturbance. The plan shall entail the following, but not be limited to:
    - Identification of the number of individual tarplants that were observed during the most-recent focused plant survey prior to impacts.
    - Identification of proposed enhancement areas through habitat characterization.
    - Methods for restoring tarplant habitat to pre-project conditions to the greatest extent feasible, and to create conditions suitable for establishment of Santa Susana tarplant and other onsite local native species.
    - Methods to restore habitat elements for insect pollinators such as retaining woody debris, brush piles with various dimensions of wood, rocks and cobble of various sizes.
    - Tarplant seeds shall be collected onsite to be successfully re-introduced into onsite restored habitat areas (i.e., backfilled areas) as well as local areas where seeds are gathered and used near the impact areas.
    - RPs and funding mechanism.
    - Performance standards and success criteria for measuring and determining establishment of tarplant individuals. Plant establishment shall be based on CDFW- qualitative and quantitative survey methods, details of which shall be specified in the restoration plan.
    - Five-year monitoring and reporting methods.
    - Maintenance requirements.
    - Weed control and maximum weed cover allowance.

- During vegetation or ground disturbance associated with remediation activities, a CDFW-approved biological monitor shall be onsite to establish avoidance areas and track any impacts to individual plants. The actual number of individual plants removed shall be documented in the final restoration plan for approval by CDFW prior to implementation.

BIO-8: Vernal Pool Branchiopods. For areas where an AOC exception is applied and vernal pools are avoided, no further mitigation is required.

If an AOC exception is not applied and vernal pool habitat is unavoidable, prior to any ground disturbance, a USFWS and CDFW-approved biologist, retained by the RPs, under the direction of DTSC, shall conduct habitat suitability assessments to determine whether suitable habitat (i.e., vernal pools, depressions) is present within remediation areas. Focused surveys for Riverside fairy shrimp and vernal pool fairy shrimp shall be conducted within 2 years prior to remediation activities proposed within suitable habitat, in accordance with USFWS protocols. If focused surveys reveal Riverside fairy shrimp or vernal pool fairy shrimp occupying proposed remediation areas, no ground disturbance shall occur until the applicant consults with USFWS and CDFW regarding additional avoidance and minimization measures based upon the conditions at the time, or until the amount of take is determined and authorized in the USFWS's Biological Opinion.

BIO-9: Special-Status Invertebrates. Prior to any vegetation or ground disturbance associated with remediation activities, preconstruction surveys shall be conducted by a qualified biologist/expert[7], retained by the RPs, under the direction of DTSC, within suitable habitat for the following species: Gertsch's socalchemmis spider, Santa Monica grasshopper, Zaca shoulderband snail, Ventura shoulderband snail, Matilija shoulderband snail, and walking stick. If any of these species are found during the preconstruction surveys, a qualified biologist shall carefully catch and release the species out of the work area and to a safe area containing suitable habitat.

BIO-10: Western Spadefoot. To avoid potential impacts to western spadefoot, prior to any ground disturbance, a CDFW-approved biologist, retained by the RPs, under direction of DTSC, shall conduct habitat suitability assessments within the project site to determine whether suitable habitat such as breeding pools/wetlands and nearby burrowing habitat is present. Based on the habitat assessments, suitable breeding pools and adjacent upland habitat shall be fenced or flagged by the CDFW-approved biologist and avoided during the active and breeding season (October - May). If suitable breeding pools cannot be avoided during this season, consultation with CDFW shall occur to determine appropriate measures to offset impacts to the species. Suitable mitigation shall include the creation of onsite breeding pool habitat. A Habitat Restoration and Monitoring Plan shall be prepared and approved by the CDFW prior to any disturbance to potential spadefoot breeding pools.

[7] A "qualified biologist/expert" is one who is familiar with the identification and ecology of the flora and fauna of the project area.

BIO-11: California Red-Legged Frog. Critical habitat for California red-legged frog (CRLF) shall be avoided to the extent feasible. If an AOC exception is applied, no further mitigation is required.

If an AOC exception is not applied and designated critical habitat for CRLF is unavoidable, cleanup activities within 300 feet of CRLF critical habitat shall be monitored for the presence of CRLF by a USFWS and CDFW-approved biologist. If the biologist detects CRLF, work activities shall cease and consultation with USFWS shall occur. A habitat restoration and monitoring plan shall be prepared and approved by the USFWS that describes revegetation and stream restoration methods.

BIO-12: Wildlife Monitoring. Prior to the daily start of cleanup activities and at the end of the work day, wildlife monitoring by the USFWS and CDFW-approved biologist, retained by RPs, under direction of DTSC, shall include inspection of any hazardous features (i.e., open trenches) that would trap, displace, injure, or kill wildlife. If nighttime construction is proposed, all lighting shall be broadcast away from any wildlife movement areas, including areas that support wildlife movement such as ephemeral drainages and closed tree canopies, to the greatest extent practical. Nighttime lighting shall be shielded downward as to avoid light spillage into the adjacent wildlife corridor to the south. Prior to the end of daily cleanup activities, the biologist shall ensure all trash is properly disposed of such that it would not be accessible to wildlife. The biologist shall monitor all open trenches and either make sure the trenches are closed by the end of the work day so no animals can enter the trench, or ensure ramps at a minimum 2:1 slope are installed in the open trench to allow animals to escape.

For areas that contain suitable habitat for special-status wildlife, including species considered locally important by Ventura County, prior to and during all vegetation and ground-disturbing activities, a USFWS and CDFW-approved biologist shall monitor work areas.

If any special-status wildlife species are encountered during biological monitoring or by construction workers, work shall halt until the biologist determines appropriate actions to avoid and minimize harm to the species. California fully protected species shall be avoided. Other actions may include relocation of the species for non-listed wildlife; however, relocation would not be allowed for any listed species without first obtaining take authorization from USFWS and/or CDFW. To the extent feasible, non-listed wildlife shall be relocated to a "release site" that is suitable habitat adjacent to the habitat where the species is found.

BIO-13: Burrowing Owl. Prior to any ground disturbance of potential suitable breeding or wintering habitat for burrowing owl, a CDFW-approved biologist, retained by the RPs, under direction of DTSC, shall conduct a habitat assessment of the proposed remediation areas and reporting in accordance with the Staff Report on Burrowing Owl Mitigation (2012) to determine whether or not owls are present. Surveys shall be conducted throughout suitable habitat within 660 feet of cleanup areas to detect wintering and breeding owls, if present.

If burrowing owls are detected, a Burrowing Owl Management Plan shall be prepared and approved by CDFW prior to commencement of construction. The Burrowing Owl Management Plan shall address owl specific minimization and avoidance measures,

measures to protect occupied habitat, and mitigation for any impacted individuals. The Burrowing Owl Management Plan shall include mitigation for impacted occupied burrows at no less than a 3:1 ratio by installation of artificial burrows or as otherwise approved by CDFW.

Prior to construction, pre-construction surveys shall be conducted no more than 14 days prior to the commencement of work activities. Within 24 hours of cleanup activities involving ground or vegetation disturbance within suitable burrowing owl habitat, a CDFW-approved biologist shall conduct a final survey to check for signs of burrowing owl. If breeding or wintering owls are detected, burrowing owls and active burrows shall be avoided and the protective buffers established in the Burrowing Owl Management Plan shall be implemented.

Destruction of unoccupied wintering burrows is considered a temporary impact, and suitable wintering habitat shall be restored to pre-project or better conditions in upland areas. If an occupied burrow is impacted by project activities, mitigation for that impact shall be implemented in accordance with the Burrowing Owl Management Plan as mentioned in the prior paragraphs.

BIO-14: Least Bell's Vireo. To avoid impacts to nesting least Bell's vireo, work activities within 500 feet of suitable nesting habitat shall be timed to avoid the season when nests may be active for this species (March 15 to September 15). If avoidance of work activities within this time period is not feasible, a USFWS protocol surveys for least Bell's vireo shall be conducted within suitable nesting habitat the season prior to initiation of work activities to determine their presence or absence within 500 feet of proposed work limits. In accordance with the USFWS survey protocol, surveys shall consist of eight site visits conducted 10 days apart during the period of April 10 to July 31. The results shall be submitted in a report to the USFWS.

If the focused surveys do not indicate the presence of least Bell's vireo, no further mitigation is required.

If occupied habitat and/or nesting individuals are determined to be present based on the focused survey, and work cannot be avoided during the nesting season, a preconstruction clearance survey shall be performed by a qualified biologist within 7 days prior to work activities to determine the approximate location of nesting territories within 500 feet of work areas. Surveys shall be conducted by a biologist approved by the USFWS and CDFW for conducting least Bell's vireo nest surveys, or by a biologist with least Bell's vireo survey experience, so long as the nest is not approached and/or disturbed. If a nest is detected or active breeding is determined, work shall halt within 500 feet of the nesting territory, and the area shall be monitored on a weekly basis until a qualified biologist determines the nest is no longer active and the young have fledged.

BIO-15: Coastal California Gnatcatcher. To avoid impacts to coastal California gnatcatcher, work activities within 500 feet of suitable nesting habitat shall be timed to avoid the general avian nesting season (March 1 to September 15). If avoidance of work activities within this time period is not feasible, focused surveys for coastal California gnatcatcher shall be conducted within suitable nesting habitat to determine their presence or absence within 500 feet of work limits. A USFWS and CDFW-approved biologist shall conduct USFWS-protocol surveys for coastal California gnatcatcher during one of

the timeframes below, and within 2 years prior to remediation activities proposed within suitable nesting habitat.

- Minimum of 6 surveys at least 1 week apart between March 15 and June 30
- Minimum of 9 surveys conducted at least 2 weeks apart between July 1 and March 14

If the focused surveys do not indicate the presence of coastal California gnatcatcher, no further mitigation is required.

If occupied habitat and/or nesting individuals are determined to be present based on the focused surveys, and work cannot be avoided during the nesting season, a preconstruction clearance survey shall be performed by a USFWS and CDFW-approved biologist within 7 days prior to work activities to determine the location of any nests within a minimum distance of 500 feet from proposed work areas. If a nest is detected, work shall halt within 500 feet of the nest, and the nest shall be monitored on a weekly basis by a qualified biologist familiar with coastal California gnatcatcher, until the biologist determines the nest is no longer active and the young have fledged.

BIO-16: Nesting Avian Species. If the nesting season cannot be avoided and construction or vegetation removal occurs between March 1 to September 15 (January 1 to July 31 for raptors), the RPs, under the direction of DTSC, shall do the following to avoid and minimize impacts to nesting birds and raptors:

- During the avian breeding season, a qualified biologist shall conduct a preconstruction avian nesting survey no more than 7 days prior to vegetation disturbance or site clearing. Surveys need not be conducted for the entire proposed remediation areas at one time; they may be phased so that surveys occur shortly before a portion of the site is disturbed. If construction begins in the non-breeding season and proceeds continuously into the breeding season, no surveys are required. However, if there is a break of 7 days or more in cleanup activities during the breeding season, a new nesting bird survey shall be conducted before construction begins again.
- The preconstruction survey shall cover all reasonably potential nesting locations on and within 300 feet of the proposed remediation areas—this includes buildings and infrastructure, and areas that would be occupied by ground-nesting species such as killdeer. A 500-foot radius shall be surveyed in areas containing suitable habitat for nesting raptors, such as trees, utility poles, rock crevices, and cliffs.
- If an active nest is found during the preconstruction avian nesting survey, a qualified biologist shall implement a 300-foot minimum avoidance buffer for all passerine birds and 500-foot minimum avoidance buffer for all raptor species. The nest site area shall not be disturbed until the nest becomes inactive, the young have fledged, the young are no longer being fed by the parents, the young have left the area, and the young will no longer be impacted by the project. Buffer areas may be increased if any endangered, threatened, CDFW fully protected, or CDFW species of special concern are identified during protocol or preconstruction surveys, based on consultation with USFWS or CDFW.
- If the nest(s) are found in an area where ground disturbance is scheduled to occur, the project operator shall avoid the area either by delaying ground disturbance in the area until a qualified biologist has determined that the birds have fledged and are no

longer reliant upon the nest or parental care for survival, or by relocating the project component(s) to avoid the area.

BIO-17: Ringtail. Prior to any vegetation or ground disturbance, a CDFW-approved biologist, retained by RPs, under direction of DTSC, shall locate and map all potential ringtail suitable caves and crevices in outcrop areas, and any sign of presence, such as scat or tracks, located within a 500-foot buffer of work area limits, or as determined in consultation with CDFW. This habitat assessment shall include searches for reptile hibernacula, bat roosting and colony sites, bird nesting areas, and dens utilized by San Diego desert woodrat. Once suitable dens are located, a minimum 100-foot no work buffer should be established, or an appropriate buffer established in consultation with CDFW. All work activities shall be conducted during day light hours. If remediation activities must occur within the 100-foot buffer, a CDFW-approved biologist shall monitor the den to ensure there is no sign of ringtail.

BIO-18: Special-Status Bats. To mitigate for potential impacts to special-status bats and maternity roosts during cleanup activities, the following measures shall be implemented prior to the commencement of remediation activities:

- *Avoidance of Maternity Roosts*. If work activities occur during the maternity roosting season (generally defined as March 1 through August 31), a qualified biologist, retained by RPs, under direction of DTSC, shall conduct a habitat assessment for potential bat maternity roosts (i.e., tree cavities, buildings, rock outcrops and crevices). If maternity roosts or bat roost sites are identified during the habitat assessment, an appropriate no-disturbance buffer shall be established at the discretion of a qualified biologist, based on the sensitivity of the bat species. If work within the buffer is deemed necessary, a qualified biologist shall monitor work activities to ensure no disturbance to the roost(s).
- *Exclusion Outside of Maternity Roosting Season*. If bats are determined by a qualified biologist to be roosting within cleanup areas, bats shall be humanely evicted and excluded. The humane eviction/exclusion shall be conducted in the fall (September or October) preceding work activities that affect roosting bats. Exclusion in the fall is recommended to avoid impacts to hibernating bats or a maternity roost (typically April through August in southern California) when flightless young are present.

  To protect roosting bats, a combination of acoustic surveys of habitat around infrastructure inspection, and exit counts shall be used to survey the area that may be directly or indirectly impacted by the project. As bats may utilize dense tree canopies, snags, rock crevices or built structures over creeks/water, these habitat types should be specifically surveyed. Foraging areas should also be identified and specific flight routes to those foraging areas as well. Bats shall be identified to the most specific taxonomic level possible, and roosts shall be evaluated to determine their size and significance.

Bat surveys shall include: (1) the exact location of all roosting sites (location shall be adequately described and drawn on a map); (2) the number of bats present at the time of visit (count or estimate); (3) each species of bat present shall be named (include how the species was identified); (4) the location, amount, distribution and age of all bat droppings shall be described and pinpointed on a map; (5) the type of roost; night roost (rest at night

while out feeding) versus a day roost (maternity colony) must also be clearly stated; and (6) all survey results, including field data sheets should be provided to CDFW.

During installation of humane eviction/exclusion devices, each crevice shall be inspected using flashlights or fiber optic scopes for the presence of day-roosting bats. At crevices where the absence of day-roosting bats is confirmed, the crevices immediately shall be sealed using materials such as foam backer rod or pipe insulation secured with adhesive to prevent bats from entering and using the crevices. At crevices where bats are visibly present or where absence cannot be confirmed, humane eviction devices shall be installed that would allow the bats to exit the crevice but prevent them from returning. The qualified biologist performing the humane eviction shall determine the exact type of eviction device to be installed and exclusionary device used. The eviction device shall remain in place for at least 14 days following installation to allow sufficient time for all the bats to vacate the crevice. After the exclusionary period, the eviction device shall be removed and exclusion device installed. The exclusion device shall remain in place for the duration of work activities, and shall be inspected weekly by a qualified biologist. All aspects of the humane eviction/exclusion of bats shall be supervised directly and monitored by a qualified biologist approved by CDFW. Following completion of activities that would impact roosting bats, the exclusion devices shall be removed by the contractor (under supervision of the qualified biologist) to allow bats to return to the roost crevices.

BIO-19: Sensitive Habitats. For areas where an AOC exception is applied and sensitive habitats are avoided, no further mitigation is required.

If an AOC exception is not applied and sensitive habitat is unavoidable, prior to vegetation removal or disturbance, a qualified biologist, retained by the RPs, under the direction of DTSC, shall characterize and map the habitats within cleanup areas in accordance with CDFW's Survey of California Vegetation and Mapping Standards (CDFW, 2015). Adjoining habitat areas shall also be included in the assessment where project activities would lead to direct or indirect impacts offsite, and impacts to these areas shall be quantified, so that mitigation areas can be determined.

In addition, during vegetation or ground disturbance associated with remediation activities, a CDFW-approved biological monitor shall be onsite to establish and mark limits of sensitive habitats to be avoided to the extent feasible. The biological monitor shall document and quantify any impacts to sensitive habitats to determine the extent and type of habitats required for restoration, as needed for preparation and implementation of a site-specific revegetation plan in accordance with Mitigation Measure BIO-5 (Revegetation Plan). Soil stabilization techniques and BMPs shall also be implemented in accordance with Mitigation Measure BIO-5Habitat mitigation acreage requirements shall be determined in consultation with CDFW and USFWS prior to any ground disturbances, and shall be indicated in the Revegetation Plan (Mitigation Measure BIO-5). For unavoidable impacts to sensitive habitats that are also jurisdictional wetlands or waters, mitigation requirements shall be developed in accordance with Mitigation Measure BIO-21 (Jurisdictional Wetlands and Waters).

Remediation activities within oak woodlands shall be avoided to the extent feasible. Oak woodland mitigation requirements shall be implemented in consultation with the Ventura County Resource Management Agency Planning Division prior to disturbance of oak woodlands. Consistent with state legislation (see SB 1334), the County allows that no more than 50 percent of the mitigation for losses to oak woodlands to be met through tree planting; thus, at least 50 percent of the mitigation to oak woodland habitat shall be in the form of habitat protection (acquisition of intact oak woodland) and/or restoration, conducted in partnership with a conservation organization or a CDFW-approved mitigation bank. Any remaining percentage of oak woodland mitigation required, if not met through habitat protection/restoration, shall be met through oak tree plantings based on the cross-sectional area of impacted oak trees. In accordance with the Ventura County Oak Woodland Management Plan, in the non-coastal zone, tree planting of protected trees (including oak trees) is based on a 1:1 ratio of the cross-sectional area of impacted trees (and not based on the number of impacted trees). Therefore, if the tree planting mitigation option is chosen in conjunction with habitat protection/restoration, oak trees with a total cross sectional area equal to that of all oak trees removed shall be provided as oak woodland mitigation.

BIO-20: Seed Collection for Habitat Restoration. Prior to the initiation of remediation activities, onsite seed collection of native plant species shall be initiated at the project site and nearby vicinity for onsite habitat restoration purposes. The seed shall be collected during the appropriate period for the species (e.g., May to June for Catalina mariposa lily), and stored onsite for habitat restoration. Seed collection methods, volumes, and timing shall be specified in the site-specific revegetation plan.

BIO-21: Jurisdictional Wetlands and Waters. Prior to any disturbance of aquatic, wetland, or riparian habitat, a jurisdictional delineation of wetlands and water courses shall be conducted for the purposes of identifying features or habitats that would be subject to the jurisdiction of the USACE, LARWQCB, and CDFW. The findings shall be included in a jurisdictional delineation report suitable for submittal to these agencies for obtaining a Section 404 Clean Water Act permit (CWA), Section 401 Water Quality Certification (WQC), Waste Discharge Requirements (WDR), and/or streambed alteration agreement (SAA).

Prior to activities that would result in the discharge of fill or dredged material within waters of the U.S., a Section 404 CWA permit shall be obtained from the USACE and a Section 401 WQC shall be obtained from the LARWQCB. Prior to activities within streams, ponds, seeps or riparian habitat, or use of material from a streambed, the project applicant shall obtain a WDR for impacts to waters not subject to the CWA, provide written notification to CDFW pursuant to Section 1602 of the Fish and Game Code, ensure the notification is complete as provided in Section 1602, and comply with the terms of conditions of any agreement CDFW may issue in response to the notification. The RP shall also consult with LARWQCB and CDFW regarding any indirect effects to aquatic or riparian habitats resulting from groundwater pumping, and such effects shall be taken into account when compensatory mitigation to these habitats are agreed upon between the applicant and regulatory agencies during the permitting process.

Based on the findings of the jurisdictional delineation report and agency verification of the extent of jurisdictional wetlands and waters, wetlands and waters shall be avoided to the extent feasible, and 100-foot setbacks shall be marked from the edge of jurisdictional

waters or riparian vegetation (whichever is wider) to maintain riparian and aquatic functions and values. In areas where avoidance of stream channels is infeasible, the site slopes and hydrology of remediated areas shall be restored to pre-construction conditions to the extent possible. If impacts to wetlands are unavoidable, compensatory mitigation shall ensure no net loss of wetlands, in accordance with permit conditions.

A compensatory mitigation plan addressing temporary and permanent impacts to jurisdictional wetlands and waters shall be prepared prior to disturbance. The plan shall be developed in consultation with the USACE, LARWQCB, and/or CDFW during the permitting process. It shall include a plan view graphic showing the target mitigation activities, a seeding and planting plan (species palette and application techniques), and a monitoring and reporting plan with performance standards and success criteria. The plan shall include a recommended timeline for mitigation activities and the establishment of seeded native species. The mitigation work shall begin in the same construction season as the initiation of grading within wetlands or aquatic habitats, and mitigation site grading shall be completed within 1 year of initiation (or as otherwise determined by resource agency permits). All established/enhanced habitats shall be protected in perpetuity within SSFL, subject to regular maintenance activities, if necessary, and appropriate to permitting agencies. Alternately, compensatory mitigation can be achieved through purchasing credits at a USACE- or CDFW-approved mitigation bank.

BIO-22: Wildlife Movement. To minimize potential impacts to terrestrial wildlife species and wildlife movement that would result from roadkill, the following measures shall be implemented:

- If any terrestrial wildlife species are encountered during biological monitoring or by construction workers, work shall halt until a qualified biologist, retained by the RPs, under the direction of DTSC, determines appropriate actions to avoid harm to the species. Wildlife shall be allowed to leave the work area before work may resume, or a qualified biologist may relocate non-listed species to areas of suitable habitat that would not be disturbed.
- To the extent practicable, truck travel on access roads and within cleanup areas should avoid dawn and dusk when wildlife activity is high.
- During rain events, work shall not occur within 50 feet of aquatic habitats or within a suitable buffer as determined by a qualified biologist.
- Speeds shall be limited to 25 mph or less within the proposed remediation areas.

BIO-23: Tree Protection. The following measures shall be implemented for protected trees that would be removed, require trimming, or if grading/excavation would occur within the root zone:

- Prior to any tree disturbance or ground-disturbing activities, the RPs, under the direction of DTSC, shall develop and implement a Tree Management and Preservation Plan under the direction of a certified arborist, and the plan shall be reviewed and approved by Ventura County and CDFW. The goal of the plan is to offset tree impacts through a sustainable, customized plan that is suitable for the site's unique opportunities for tree preservation, enhancement, and establishment. The plan shall identify trees protected by Ventura County, including oak, sycamore, historical and heritage trees (protected trees) or special-status trees (e.g., southern

California black walnut) that would be impacted within or adjacent to remediation areas, as well as those located outside of the project footprint that would be preserved. The plan shall define direct and indirect impacts and include mitigation options within cleanup areas, as well as outside of cleanup areas, such as tree relocation or replacement, and identify appropriate reference site(s) and the locations of mitigation areas. The plan shall specify RPs, funding sources, restoration areas, performance standards and success criteria based on reference site(s), minimum 5-year maintenance and monitoring requirements, adaptive management strategies, and regulatory authorities. RPs, under the direction of DTSC, can mitigate trees within another RP's area if both parties agree, and such arrangements shall also be specified in both parties' tree management and preservation plans. Performance measures shall include 100 percent survival of trees relocated or replaced during the plant establishment period.

- Protection measures for protected trees include fencing and protection of oak trees adjacent to construction areas. In addition, placement of fill, storage of equipment, and grading shall be prohibited within the protective zone (minimum of 5 feet from the dripline, or 15 feet from the trunk of the tree, whichever distance is greater) of any tree proposed for preservation. Grade changes near the protective zones of oak trees shall be limited to the greatest extent feasible. Retaining walls shall be used to protect oaks proposed for preservation from surrounding cut and fill, and no surfaces shall be placed within a 6-foot radius of oak tree trunks; any retaining walls shall be placed outside of the protective zone of the oak tree to be preserved. Any encroachment within the specified limits above shall require monitoring by a qualified arborist, so that measures can be implemented to avoid any long-term impacts to the tree, such a specific root pruning techniques if any minor roots would be disturbed, or to monitor branch pruning to allow for necessary equipment access. All oak trees encroached by subsurface cleanup activities involving excavation or grading shall be monitored for a minimum of 1 year, and permanent encroachments to oak trees such as placement of fill (i.e., pavement) shall be monitored for a minimum of 2 years to assess the health of the tree and identify signs of stress that occurred as a result of the encroachment. If the health of the protected tree is determined to be in decline as a result of the project's disturbance within the tree's protective zone, the tree shall be replaced in accordance with Mitigation Measure BIO-23, above.

4.3.7 Impact Summary

Upon incorporation of Mitigation Measures BIO-1 through BIO-23, most potential impacts would be reduced to less than significant. However, if an AOC exception is not applied, impacts to Braunton's milk-vetch, Braunton's milk-vetch designated critical habitat, and Santa Susana tarplant, along with impacts to local plans or policies would be significant and unavoidable. At this time, DTSC has not determined whether to apply an AOC exception to protect these resources.

TABLE 4.3-12
SUMMARY OF IMPACTS – BIOLOGICAL RESOURCES

Impact	Overall Project	DOE Initial Project	NASA Initial Project	DOE Demolition Activities	RCRA Post-Closure Facility Closure	Mitigation Measures
Impact 4.3-1a: Adverse effect on Braunton's milk-vetch	S&U	--	--	--	--	BIO-1 through BIO-4
Impact 4.3-1b: Adverse effect on Braunton's milk-vetch	--	S&U	LSM	LTS	LTS	BIO-1 through BIO-4
Impact 4.3-2a: Adverse effect on special-status species	S&U	--	--	--	--	BIO-1, BIO-2, BIO-4 through BIO-18
Impact 4.3-2b: Adverse effect on special-status species	--	S&U	LSM	LSM	LSM	BIO-1, BIO-2, BIO-4 through BIO-18
Impact 4.3-3a: Adverse effect on riparian habitat	S&U	--	--	--	--	BIO-5, BIO-19, BIO-20
Impact 4.3-3b: Adverse effect on riparian habitat	--	S&U	S&U	NI	NI	BIO-5, BIO-19, BIO-20
Impact 4.3-4a: Adverse effect on federally or state protected wetlands and waters	S&U	--	--	--	--	BIO-4 and BIO-21
Impact 4.3-4b: Adverse effect on federally or state protected wetlands and waters	--	LSM	LSM	NI	NI	BIO-4 and BIO-21
Impact 4.3-5a: Interfere with movement of fish or wildlife	LSM	--	--	--	--	BIO-12, BIO-16, BIO-22
Impact 4.3-5b: Interfere with movement of fish or wildlife	--	LSM	LSM	LSM	LSM	BIO-12, BIO-16, BIO-22
Impact 4.3-6a: Conflict with local policies protecting biological resources	S&U	--	--	--	--	BIO-1 through BIO-23
Impact 4.3-6b: Conflict with local policies protecting biological resources	--	S&U	LSM	LSM	LSM	BIO-1 through BIO-10, and BIO-12 through BIO-23
Impact 4.3-7: Conflict with approved local, regional or state habitat conservation plans	NI	NI	NI	NI	NI	N/A

NI = No impact
LTS = Less than significant
S&U = Significant and unavoidable
LSM = Less than significant with mitigation incorporated

4.4 Cultural Resources

This chapter addresses the potentially significant adverse impacts of the project to cultural resources in accordance with the significance criteria established in Appendix G of the CEQA Guidelines. Although the NOP was filed before July 1, 2015, prior to which projects are required to comply with provisions of AB 52, DTSC has adopted the Appendix G checklist question pertaining to Tribal Cultural Resources as part of this Cultural Resources section for the purposes of this evaluation (see Section 4.4-2) rather than adopting a separate Tribal Cultural Resources section.

Given the sensitivity of cultural resources associated with the project area, DTSC, along with NASA and DOE, have engaged local tribes to coordinate on resources of tribal interest. As part of this coordination, on July 18-19, 2014, a Native American Sacred Sites Council Summit Meeting was held to establish a consortium of federally and non-federally recognized tribes who would coordinate as part of the Santa Susana Field Laboratory Sacred Sites Council (SSFL Sacred Sites Council) on project-related topics involving resources of tribal interest. Invited affiliations included: Barbareño/Ventureño Band of Mission Indians, Gabrielino Tongva Indians of California, Fernandeño Tataviam Band of Mission Indians, Santa Ynez Band of Chumash Indians, Coastal Band of the Chumash Nation, Chumash/Tataviam/Fernandeño, Chumash, Ketanemuk and Towlumne Tejon Indians, Kizh Gabrieleno Band of Mission Indians, Kern Valley Indian Council, Chumash/Fernandeño/Tataviam/Shoshone/Paiute/Yaqui, Tongva Ancestral Territorial Tribal Nation, San Gabriel Band of Mission Indians, Owl Clan, San Fernando Band of Mission Indians, San Luis Obispo County Chumash Council, Wishtoyo Foundation, San Manuel Band of Mission Indians. Affiliations in attendance included: Barbareño/Ventureño Band of Mission Indians, Gabrielino Tongva Indians of California, Fernandeño Tataviam Band of Mission Indians, Santa Ynez Band of Chumash Indians, Chumash/Tataviam/Fernandeño, Chumash, Kizh Gabrieleno Band of Mission Indians, Chumash/Fernandeño/Tataviam/Shoshone/Paiute/Yaqui, and Wishtoyo Foundation. Affiliations represented in subsequent SSFL Sacred Sites Council meetings over the past several years varies amongst the previously-mentioned affiliations but generally include Chumash, Tataviam, and Gabrielino Tongva representatives (DOE, 2017).

The existing setting for cultural resources is provided along with the relevant regulatory background. Applicable project impacts and mitigation measures, as necessary, are presented. The analysis in this section is based on examination of available reports for the project area including survey reports, historic maps and aerial photos, geological maps, and soils surveys.

The categorical term “cultural resources” refers to remains and sites associated with human activities and includes: prehistoric and historic archaeological resources; tribal cultural resources of value to California Native American tribes; architectural/built-environment resources; and human remains. Under CEQA, paleontological resources, although not associated with past human activity, are analyzed with cultural resources. For the purposes of this analysis, cultural resources are categorized into the following groups: archaeological resources, tribal cultural

resources, historic-period built resources (including architectural/engineering resources), and human remains. Paleontological resources are also addressed in this section.

Archaeological resources are places that contain tangible remnants of past human activity. Archaeological resources may be either prehistoric (before European contact), ethnohistoric (Native American settlements occupied after the arrival of European settlers in California), or historic-period (after European contact and generally reflecting land uses introduced by Euro-Americans). The most frequently encountered prehistoric or historic Native American-associated archaeological sites are village settlements with residential areas and sometimes cemeteries; temporary camps where food and raw materials were collected; smaller, briefly occupied sites where tools were manufactured or repaired; and special-use areas like caves, rock shelters, and rock art sites. Historic-period archaeological sites may include foundations or features such as privies, corrals, and trash dumps.

Tribal cultural resources include sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe. Tribal cultural resources may include ethnographic resources such as places and elements of the natural landscape of cultural importance to Native Americans, sacred sites, archaeological resources, rock art, and prominent topographical areas, features, habitats, plants, animals, and minerals that contemporary Native Americans value and consider essential for the preservation of their traditional values. Such resources may also constitute a Traditional Cultural Property (TCP) or cultural landscape.

Historic-period built environment resources include standing structures, infrastructure, and landscapes of historic or aesthetic significance that are generally 50 years of age or older. In California, historic resources considered for protection tend to focus on architectural sites dating from the Spanish Period (1529–1822) through World War II (WWII) and post-war-era built environmental resources. Some resources, however, may have achieved significance within the past 50 years if they meet the criteria for exceptional significance. Historic resources are often associated with archaeological deposits of the same age.

Human remains (inhumations and cremations) include burials both within and outside formal cemeteries, including: town cemeteries and burial grounds; family burial plots; church graveyards; military cemeteries; Native American burial mounds; and prehistoric and historic-period isolated grave sites. Native American groups in California practiced both inhumation and cremation. Large burial mounds containing hundreds of individuals have been documented in California, although single or small-group burials are also common. After Spanish settlement, many missionized Native Americans were interred in mission cemeteries. Burial practices varied among historic-period immigrant groups to California. Historic-period burial sites range from large formal cemeteries to small family plots to isolated burials in remote areas.

Paleontology is a branch of geology that studies the life forms of the past, especially prehistoric life forms, through the study of plant and animal fossils. Paleontological resources represent a limited, nonrenewable, and impact-sensitive scientific and educational resource. As defined in this section, paleontological resources are the fossilized remains or traces of multicellular invertebrate and vertebrate animals and multicellular plants, including their imprints from a

previous geologic period. Fossil remains such as bones, teeth, shells, and leaves are found in the geologic deposits (rock formations) where they were originally buried. Paleontological resources include not only the actual fossil remains, but also the collecting localities, and the geologic formations containing those localities.

4.4.1 Environmental Setting

This section provides a local and southern California regional context and setting for the project site.

4.4.1.1 Geographic Setting

The project is located within the Simi Hills, which are situated at the west end of the San Fernando Valley. The Simi Hills are surrounded by the Santa Monica Mountains to the south, the Simi Valley and Santa Susana Mountains to the north, and the Thousand Oaks Valley to the west. The Santa Barbara Channel is located approximately 30 miles to the west, and the Santa Monica Bay approximately 12 miles to the south.

The Simi Hills lie within the northern Santa Monica Mountains. Its landscape consists of weathered eroded sandstone outcrops and large drainages, with a steep and rocky terrain. It generally contains a chaparral/oak woodland environment with plants including oak, chia, poison oak, elderberry, as well as other grasses and shrubs (CRM Tech, 2010). Its highest point is Simi Peak, which reaches an elevation of 2,401 feet AMSL, and its hills stretch about 16 miles running southwest-northeast (Corbett and Guttenberg, 2014).

The Simi Hills are characterized by outcrops of the upper Cretaceous Chatsworth Formation. Most of this formation is composed of medium-grained sandstone interspersed with thin siltstone beds of coarse sand (Corbett and Guttenberg, 2014). One of the most prominent features of the Simi Hills is the abundance of rock shelters, located within the sandstone outcrops of the Chatsworth Formation, formed through a combination of rain and wind in what is a predominantly semi-arid climate (Corbett and Guttenberg, 2014).

The highest surface elevation at the project site occurs near the center at an approximate elevation of 2,245 feet AMSL, along two general ridges that trend northeast-southwest. The lowest elevation within the project site occurs at the eastern property boundary in Dayton Canyon and has an elevation of approximately 1,120 feet AMSL. The lower elevations at the project site occur primarily along the eastern, southern, and north-central to northwestern perimeters of the property. A broad, relatively flat area of topography exists within the northwestern portion of the project site and is referred to as the Burro Flats area.

Numerous ephemeral stream channels and drainages are present throughout the project site. Most surface water is intermittently present only during the winter rainy season and is conveyed offsite via one of four drainage areas: the Northwestern, Northern, Happy Valley, and Bell Creek drainages. The majority of the surface water (estimated at greater than 60 percent) from the project site runs off the southern property boundary through Bell Canyon and into Bell Creek, which subsequently discharges into the Los Angeles River. The northwestern perimeter of the site

drains northward into Meier Canyon, which subsequently discharges into Arroyo Simi. The hills form the upper watersheds for several perennial to seasonal channels, including Las Virgenes Creek, Moore's Canyon Creek, Bell Creek, Dayton Creek, Woolsey Canyon Creek, Brandeis Creek, Runkle Canyon Creek, Arroyo Simi, Palo Comado Creek, Cheeseboro Creek, and Arroyo Calabasas.

Geology

The project site is situated within the Transverse Ranges Geomorphic (Physiographic) Province, which is an east-west oriented mountain range that is in contrast to the predominately north-south trend of most California mountain ranges (Harden, 2004). Regionally, the geology of the Transverse Ranges is dominated by plutonic igneous rocks; however, there are many terrestrial and marine rock exposures within the province. During much of the geologic history of southern California, sea levels were much higher than today and many southern California geological formations are therefore marine in origin. The predominately marine rock outcrops in southern California are punctuated by episodes of terrestrial deposition during periods of lower sea levels. The geology within the project site is predominately characterized by marine deposition.

The geologic units within the project site consist of the following geological units from oldest to youngest: the late Cretaceous Chatsworth Formation (approximately 83–66 million years ago [mya]); the Paleocene to Eocene Santa Susana Formation (approximately 66–56 mya), which within the project site includes the Simi Conglomerate Member, the Las Virgenes Sandstone Member, and an unnamed claystone/siltstone unit; middle to late Miocene detrital sediments of Lindero Canyon geological unit (approximately 15.5-13.5 mya); and Quaternary (recent) alluvium (less than 12,000 years ago) in canyon bottoms and as a scattered thin veneer covering older outcrops (Dibblee, 1992).

Flora and Fauna

Vegetation throughout the project site is currently composed of various coastal sage scrub and chaparral plant communities, oak woodland, mulefat scrub, and annual and perennial grasslands. Native vegetation types identified within the project site include yerba santa (*Eriodictyon crassifolium*) scrub, deerweed (*Acmispon glaber*) scrub, chamise-black sage (*Adenostoma fasciculatum-Salvia mellifera*) scrub, upland and riparian coast live oak (*Quercus agrifolia*) woodland, laurel sumac (*Malosma laurina*) scrub, coyote brush (*Baccharis pilularis*) scrub, mulefat (*Baccharis salicifolia*) thicket, arroyo willow (*Salix lasiolepis*) thicket, birch-leaf mountain mahogany (*Cercocarpus betuloides*) chaparral, greenbark ceanothus (*Ceanothus spinosus*) chaparral, bush mallow (*Malacothamnus fasciculatus* ssp. *fasciculatus*) scrub, holly-leaved cherry (*Prunus ilicifolia ssp. ilicifolia*) chaparral, and to a lesser extent, California sagebrush (*Artemisia californica*) scrub, California bulrush (*Bolboschoenus maritimus*) marsh, and black sage (*Salvia mellifera*) scrub (Padre, 2013).

Native habitats within or near the project site function to some degree as a wildlife movement corridor, connecting habitat areas throughout the Simi Hills. According to the South Coast Wildlands Missing Linkages Project (South Coast Wildlands, 2008), the Simi Hills are within the Santa Monica-Sierra Madre Landscape Linkage, which connects the Santa Monica Mountains to

the south along the ocean and the Sierra Madre Ranges of the Los Padres National Forest to the north, and includes the Simi Hills.

The project site supports habitat for a number of amphibian, reptile, mammal, and bird species. Native mammal species identified within the project site include Audubon's cottontail (*Sylvilagus audubonii*), brush rabbit (*Sylvilagus bachmani*), black-tailed deer (*Odocoileus hemionus*), coyote (*Canis latrans*), woodrat (*Neotoma* sp.), gray fox (*Urocyon cinereoargenteus*), California ground squirrel (*Spermophilus beecheyi*), western gray squirrel (*Sciurus griseus*), California vole (*Microtus californicus*), deer mouse (*Peromyscus maniculatus*), mountain lion (*Puma concolor*), and bobcat (*Lynx rufus*) (Padre, 2013). Bird species include raptors such as red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and turkey vulture (*Cathartes aura*), along with many species of grassland foragers, such as blue grosbeak (*Passerina caerulea),* black phoebe (*Sayornis nigricans*), and lazuli bunting (*Passerina amoena*) (Bryne, 2014). Numerous reptile species also occur.

Several inventories of native plant and animal species that are traditionally used by the Chumash people have been completed. In 2011, as a result of NASA's consultation with the Santa Ynez Band of Chumash Indians, six plants and five animals within Area I (NASA) and Area II were identified as having known cultural use by the Santa Ynez Band of Chumash Indians (CH2M Hill, 2014). As part of NASA's draft TCP study (Lawson, 2013: Table 6.1-1), additional tribal interviews and research identified 12 plant species (broad leaved milkweed [*Asclepias eriocarpa*], narrow leaved milkweed [*Asclepias fascicularis*], common fiddleneck [*Amsinckia menziesii*], wild cucumber or Manroot [*Marah macrocarpus*], Coast live oak [*Quercus agrifolia*], chia sage [*Salvia columbariae*], yucca [*Yucca whipplei*], brodaeia [*Dichelostemma pulchellum*], mustard [*Guiliana lasiophylla*], elegant clarkia [*Clarkia unguiculata*], soaproot [*Chlorogalum pomeridianum*], and white snapdragon [*Antirrhinum coulterianu*]) and six animal species (coast horned lizard [*Phrynosoma blainvillii, Anota coronatum*], acorn woodpecker [*Melanderpes formicivorus*], American crow [*Corvus brachyrhynchos*], common raven [*Corvus corax*], greater roadrunner [*Geococcyzus californianus*], and deer) with traditional use within the NASA portion of the project site were identified.

In 2014, Leidos compiled a list of plant species with known ethnographic uses that occur in Area IV (Bryne, 2014: Appendix A). This list, which included 81 plants, was based on a review of published ethnographic literature, but did not include interviews with Native American representatives.

In general, the result of the efforts to identify species with traditional use within Area IV and Area I (NASA) and Area II indicated that there are a large number of plant species within the project site that have been documented as being traditionally important to Native American communities, primarily as food sources or having a medicinal use. These plants were likely important to prehistoric communities as well. Important food sources would have included acorns from coast live oak (*Quercus agrifolia*), holly-leaf cherry (*Ceanothus crassifolia*), manzanita (*Arctostaphylos* spp.), yucca (*Yucca whipplei*), and seeds from numerous plants, including brodiaea (*Dichelostemma capitatum*), chia (*Salvia columbariae*), and tarweed (*Deinandra*

minthornii). Important medicinal plants included Jinsomweed (*Datura wrightii*), arroyo willow (*Salix* spp.), and coyote brush (*Baccharis pilularis*) (Bryne, 2014).

4.4.1.2 Prehistoric Context

Southern California has one of the most diverse environments in the world, including mountains and hills, deserts and valleys, and beaches and offshore islands. As a result, southern California archaeology contains a long and rich record of past human activity. The cultural heritage of southern California began at least 13,000 years ago when the first of several waves of people arrived and inhabited the area (Glassow et al., 2007). Southern California's prehistoric population is one of the largest and most diverse in the Western hemisphere, consisting of numerous cultural groups that spoke many distinct languages.

The most recent regional chronological synthesis, developed by Michael Glassow et al. (2007) for the Santa Barbara Channel, Santa Monica Mountains, and the Los Angeles Basin, in conjunction with Chester King's regional chronology (1990; 2011) is used to discuss the cultural sequences for the purpose of this document.

Paleo-Coastal Prehistoric Period: 11,000–7000 cal B.C.

It is not definitively known when human habitation in California first began, although some of the earliest evidence for human occupation in North America has been found on the California Channel Islands. The Arlington Springs Woman site on Santa Rosa Island, which contains some of the earliest human remains found in North America, dates to approximately 11,000 calibrated years (cal) B.C., while the Daisy Cave site on San Miguel Island has an early occupation dating to 9500 cal B.C. (Glassow et al., 2007). On the southern Channel Islands of San Clemente, the Eel Point site revealed evidence of boat technology dating to around 6250 B.C. (Cassidy et al., 2004).

The earliest evidence of occupation on the Santa Barbara Channel mainland comes from the Surf site near the mouth of the Santa Ynez River, which has been radiocarbon dated to 8000–7500 cal B.C. (Glassow et al., 2007). On the Los Angeles and Ventura County coasts, evidence of paleo-coastal occupation is lacking; some of the earliest dated occupation in this area is in the Ballona Creek area, which contains sites that date to approximately 6000–5000 B.C. (Altschul et al., 1992).

This earliest period of human occupation is characterized by small groups of nomadic hunter-gatherers who occupied small, temporary settlements used for gathering and processing shellfish. Evidence from the Surf site indicates that the earliest inhabitants of the Santa Barbara Channel area collected shellfish and produced flake tools using local chert (Glassow et al., 2007). Generally, the artifact assemblage of this time period included a limited collection of rough and simplistic tool types, each used for multiple tasks; key artifacts included fluted projectile points.

Millingstone Horizon: 7000–5000 cal B.C.

Milling equipment is first observed in the archaeological record during this time, a period identified as the Millingstone Horizon (Glassow et al., 2007). During this period, population densities along the coastal mainland increased. Departing from the subsistence strategies of their

nomadic predecessors, Millingstone populations established more permanent settlements and relied on more diversified food sources. Settlements were located primarily on the coast and in the vicinity of estuaries, lagoons, lakes, streams, and marshes where a variety of resources, including seeds, fish, shellfish, small mammals, and birds, were exploited. However, despite the increase in new food resources, the diet from this period continued to rely heavily on the processing of hard seeds (Wallace, 1955). Early Millingstone occupations are typically identified by the presence of handstones (manos) and millingstones (metates), while those Millingstone occupations dating later than 5000 B.C. contain a mortar and pestle complex as well, signifying an increased dependence on new food sources, such as acorns and starchy tubers.

Material culture during this period reflected a more diversified stone tool assemblage consisting of fine-worked projectile points and a large number of milling stones and stone bowls, as well as the prevalence of ornamental and ceremonial objects (Glassow et al., 2007). Olivella shell bead manufacture began during this time period.

Little is known about the social organization of Millingstone groups, but available evidence indicates that they likely consisted of small extended family groups with minimal social differentiation or political leadership (Glassow et al., 2007).

Early Period: 6000–800 cal B.C.

Between 4500 and 2000 cal B.C., several major changes in subsistence occurred. Wide use of the mortar and pestle during this time indicates a greater variety of plant foods were used. In addition, a higher frequency of projectile points may stem from the greater importance of hunting, and possibly a shift in settlement systems and gender-based division of labor (Glassow et al., 2007). Mortuary practices may indicate a greater emphasis on status and leadership. The manufacture of shell beads, use of ritual objects, changing mortuary practices, and evidence of increasing trade across the channel between the islands and the mainland all point to a corresponding increase in social complexity between 5000 and 2000 B.C.

After 2000 B.C., a broader diet included diverse marine and terrestrial species (Glassow et al., 2007). Contracting stem points, notched net weights, circular shell fishhooks, and mortars and pestles are all characteristic of this period. The use of asphaltum (naturally occurring asphalt), as evidenced by basketry impressions and tarring pebbles, is also first found in the archaeological record around 2000 B.C. Between 2000 B.C. and A.D. 1, new technologies, such as the use of asphaltum, net weights, and fishhooks, suggest an intensification in fishing and coastal trade and a highly focused maritime economy (Glassow et al., 2007).

Middle Period: 800 cal B.C.–A.D. 1250

Increasing population densities and numbers of permanent settlements along the coast after 500 B.C. led to competition for resources and increased socioeconomic differentiation. Coastal sites of this period contain substantial midden deposits and cemeteries that were in use for long periods of time, reflecting this population trend.

Two important technological advances were achieved in the Middle Period: the introduction of the wooden plank canoe (called *tomol* by the ethnographic Chumash and *ti'at* by the ethnographic

Tongva) and the bow and arrow. The plank canoe, which may have been developed as early as A.D. 500, allowed for passage into deeper waters, facilitating trade and the procurement of large fish and sea mammals (King, 1990; Glassow et al., 2007). The bow and arrow, also adopted around A.D. 500 as it was in other regions of California, was used both to hunt large game as well as in inter-group warfare. Shell beads and ornaments, steatite objects, lithic materials, groundstone, and red ochre were traded throughout southern California during this period (Glassow et al., 2007).

Between A.D. 800 and 1400 an episode of sustained drought, known as the Medieval Climatic Anomaly (MCA), occurred. While the effects of this environmental change on prehistoric populations are still being debated, it did likely lead to local adaptations in subsistence strategies resulting from substantial stress on natural resources. In the Santa Barbara Channel, some researchers have suggested that environmental stress as a result of the MCA may have led to greater social complexity, increasing sedentism, and extensive trade (Kennett and Kennett, 2000; Glassow et al., 2007). However, others have asserted that increased cultural complexity was more gradual and less influenced by environmental factors (King, 1990; Gamble, 2005).

It has been postulated that as early as 1500 B.C., a Takic-speaking people arrived in coastal Los Angeles and Orange Counties, having migrated west from inland desert regions (Kroeber, 1925; Golla, 2007; Sutton, 2009). By around A.D. 500 to 1000, Takic language and cultures had spread to the south and inland to the east. These new arrivals, linguistically and culturally different from earlier coastal populations, may have brought new settlement and subsistence systems with them, along with other new cultural elements (Sutton, 2009). This is thought to be a factor in several of the significant changes in material culture seen in the Late Holocene throughout southern California (such as the use of smaller projectile points and pottery), as well as the introduction of cremation as a burial practice.

Late Period: A.D. 1250–circa 1769

The increase in social complexity that began in the Middle Period continued into the Late Period, with evidence of ranked society and a hereditary elite class documented from mortuary contexts (Glassow et al., 2007). The population along the Santa Barbara mainland coast reached its highest point during the late period, and population tended to cluster in large coastal settlements (Glassow et al., 2007).

By the Late Period, manos and metates were not commonly used, and mortars and pestles were the dominant food-processing technology. This shift was likely associated with the increasing importance of acorns in the prehistoric diet (Gamble and Russell, 2002). The regional exchange network expanded during this period, with trade between the islands and coastal sites increasing and coastal and interior settlements linked through the exchange of marine resources and other goods, such as steatite vessels manufactured on Santa Catalina Island (Glassow et al., 2007).

4.4.1.3 Ethnographic Context

The geographic area around SSFL was an area where the territories of three tribes, the Chumash, Tataviam, and Tongva, intersected (Johnson, 2006; King and Parsons, 2000). Various ethnographers have placed the project site within Chumash or Tongva territory; however,

regardless of where the territorial boundaries were located, it is clear from historic records that at the time of European contact, the Simi Hills area was a place where the three groups interacted, traded, and resided in close proximity. In addition, the Santa Susana Pass served as a trade corridor between the upper Santa Clara River Valley, inhabited by the Tataviam, the Tongva in the San Fernando Valley, and the Chumash to the south and west (Corbett et al., 2015).

Tataviam

Tataviam territory was concentrated northeast of the project site along the upper reaches of the Santa Clara River drainage between the Santa Susana Mountains on the south and the northern foothills of the Liebre Mountains on the north, although it may have extended as far as the Tehachapi Mountains and included portions of the Antelope Valley (Johnson and Earle, 1990; King and Blackburn, 1978). Their territory also included Piru Creek on the west and Sierra Pelona on the east. Tataviam territory was bounded by the Tongva to the south, the Serrano to the east, the Kitanemuk to the northeast, the Emigdiano Chumash to the north, and the Ventureño Chumash to the west.

There are few historical sources regarding the Tataviam. The word "Tataviam" most likely came from a Kitanemuk word that may be roughly translated as "people of the south-facing slope," due to their settlement on south-facing mountain slopes (King and Blackburn, 1978). The Chumash referred to them as "Alliklik" (Kroeber, 1925). What the Tataviam called themselves is not known. The Tataviam spoke a language that was part of the Takic branch of the Uto-Aztecan language family (King and Blackburn, 1978).

Tataviam villages varied in size from larger centers with as many as 200 people, to smaller villages with only a few families (King and Blackburn, 1978). At the time of Spanish contact, the Tataviam population is estimated to have been less than 1,000 people. Primary vegetable food sources included acorns, juniper berries, seeds, and yucca buds. Small game such as antelope and deer supplemented these foods. Trade networks between inland groups such as the Tataviam, the desert groups such as the Luiseno, and coastal groups such as the Chumash and Tongva enabled the trade of exotic materials such as shell, asphaltum, and steatite.

The first European visit to Tataviam territory occurred in A.D. 1769 with the expedition of Gaspar de Portolá, and again in 1776 with the expedition of Friar Francisco Garcés. During the time of the Spanish missions, many Tataviam had been baptized at the Mission San Fernando (King and Blackburn, 1978). Tataviam often married members of other native groups, and the last speaker of the Tataviam language had died by 1916. However, today, Tataviam descendants still reside in southern California, some of whom are members of the Fernandeño Tataviam Band of Mission Indians.

Tongva

The Takic-speaking Tongva inhabited much of the Los Angeles basin, the southern Channel Islands, and the San Fernando Valley to the east of SSFL. The term "Gabrielino" is a general term that refers to those Tongva who were administered by the Spanish at the Mission San Gabriel Arcángel (sometimes also referred to as "Gabrieleño"). "Fernandeño" refers to Native Americans, many of them Tongva, who were associated with Mission San Fernando Rey. Prior to

European colonization, the Tongva occupied a diverse area that included the watersheds of the Los Angeles, San Gabriel, and Santa Ana rivers; the Los Angeles basin; and the islands of San Clemente, San Nicolas, and Santa Catalina (Kroeber, 1925).

The Tongva language, like the Tataviam language, was part of the Takic branch of the Uto-Aztecan language family. Although the Tongva language was unrelated to the Chumash language, the two groups apparently shared similar social traits and ritual practices (Glassow et al., 2007). Tongva economic and political organization was also similarly complex compared with the Chumash, and the Tongva actively participated in social and economic interaction with the Chumash.

The Tongva were hunter-gatherers and lived in permanent communities located near the presence of a stable food supply. Community populations generally ranged from 50 to 100 inhabitants, although larger settlements may have existed. The Tongva are estimated to have had a population numbering around 5,000 in the pre-contact period (Kroeber, 1925). Villages are reported to have been the most abundant in the San Fernando Valley, the Glendale Narrows area north of downtown, and around the Los Angeles River drainage (Gumprecht, 2001).

Tongva society was characterized by patrilineal, non-localized clans, each clan consisting of several lineages. The Tongva inhabited large circular, domed houses constructed of willow poles thatched with tule (Bean and Smith, 1978). Other village structures of varying sizes served as sweathouses, ceremonial enclosures, and granaries.

Subsistence consisted of hunting, fishing, and gathering. Small terrestrial game was hunted with deadfalls, rabbit drives, and by burning undergrowth, while larger game such as deer were hunted using bows and arrow (Bean and Smith, 1978). The primary plant resources were the acorn, gathered in the fall and processed in mortars and pestles, and various seeds that were harvested in late spring and summer and ground with manos and metates.

At the time of Spanish contact, many Tongva practiced a religion that was centered around the mythological figure Chinigchinich (Bean and Smith, 1978). This religion may have been relatively new when the Spanish arrived, and was spreading at that time to other neighboring Takic groups. Other Tongva ceremonies include boys' and girls' puberty ceremonies, courtship and marriage rituals, and seasonal rituals. Seasonal ceremonies included a summer solstice ritual, harvest celebration, and winter solstice ritual (McCawley, 1996).

Coming ashore on Santa Catalina Island in October of 1542, Juan Rodriguez Cabrillo was the first European to make contact with the Tongva; the 1769 expedition of Gaspar de Portolá also passed through Tongva territory (Bean and Smith, 1978). Native Americans suffered severe depopulation and their traditional culture was radically altered after Spanish contact. Nonetheless, Tongva descendants still reside in the greater Los Angeles and Orange County areas and maintain an active interest in their heritage.

Chumash

By the time the Spanish arrived in the 16th century, the Chumash people had developed a complex culture with a socially stratified society, complex trade networks, and a monetary economy based on shell beads. At that time, the Chumash had one of the most complex political and economic systems in western North America (Glassow et al., 2007). Chumash territory included the northern Channel Islands and the coastal region between current-day Malibu and the Monterey County line (Gamble, 2011; Grant, 1978). Total population may have included as many as 15,000–20,000 people.

The Chumash language family appears to be a linguistic isolate, and unrelated to other California languages. Within the Chumash language family, there were three branches: Obispeño or Northern Chumash, which had at least two dialects; Central Chumash, which included the languages Purisimeño, Ineseño, Barbareño, and Ventureño; and Island Chumash (Golla, 2007).

The territory of the Ventureño-speaking Chumash extended from the Pacific coast in the vicinity of Ventura in the west to the area between Sespe and Piru Creeks in the middle portion of the Santa Clara River drainage in the west, and from the headwaters of Sespe Creek in the north to the area around Malibu Creek in the south (Kroeber, 1925; Grant, 1978). However, by the Mission period Ventureño territory extended just east of Piru Creek (King, 1975; Glassow et al., 2007). The Ventureño Chumash were bounded by the Tataviam to the east, the Tongva to the southeast, the Emigdiano Chumash to the north, and the Barbareño, Ineseño, and Cuyama Chumash to the west.

The Chumash represented a complex society with a strict social order, with a well-established and prosperous system of trade, and standardized money exchange in the form of shell beads. With settlements on the Channel Islands, the Chumash were master maritime navigators, having developed the split-planked canoe (tomol) to ferry people and trade goods between the islands and the mainland.

The Chumash were hunter-gatherers and lived in permanent villages. The size of Chumash villages ranged considerably from the coastal areas to the inland areas with many villages on the coast having several hundred occupants, whereas villages inland were significantly smaller, sometimes containing only a couple dozen inhabitants (Grant, 1978). Chumash villages were most abundantly located along the coast and were often situated on high ground adjacent to a river or stream that flowed into the ocean or along the borders of sloughs or wetlands (Grant, 1978).

Chumash people made use of their diverse environment, capitalizing upon a wide range of natural and animal resources for food and as raw material for the crafting of functional tools and ornamental items (Kroeber, 1925). Amongst terrestrial plant resources, the acorn, collected mainly from the California live oak, was the most important. Additional plant resources included pine nuts, wild cherry, cattail, California laurel berries, and chia sage seeds. Mule deer, coyote, and fox were hunted using the bow and arrow, and smaller game was taken using deadfalls and snares. Migratory birds such as ducks and geese were also hunted. In addition to terrestrial

resources, the Chumash used an array of maritime resources including shellfish, sea mammals, and pelagic and schooling fish.

Chumash villages were composed of a patrilineal descent group and usually had at least one chief, known as the *wot* or *wocha*, whose position was inherited but was subject to village approval. A secret men's society called '*antap* was also highly influential in Chumash society. The '*antap* society supported the chief and sponsored religious and social gatherings (Grant, 1978).

Not much is known of the religion practiced by the Chumash. Father Olbés of the Santa Barbara mission noted a Chumash deity called *sup*, and although the Chumash had no figures or idols of the deity, they made offerings of seeds and feathers to show their acknowledgement and gratitude for the blessings given them (Grant, 1978). The summer solstice, harvest festival (*hutash*), and winter solstice were important ceremonies in the Chumash calendar. The winter festival, in particular, was important because the rituals performed by shamans were intended to cause the sun's rebirth and to entice it into shifting its course back to the north (Romani, 1981).

The Chumash were one of the first native Californian groups encountered by Juan Rodriguez Cabrillo when he sailed into the Santa Barbara Channel Island region in 1542-43 (Grant, 1978; Kroeber, 1925). The Gaspar de Portolá expedition passed through Chumash territory on its way to Monterey Bay in 1769. Between 1772 and 1804, five missions, including Missions San Luis Obispo (1772), San Buenaventura (1782), Santa Barbara (1786), La Purisima Concepcion (1787), and Santa Ynez (1804), were established in Chumash territory. The establishment of the missions fractured the traditional culture of the Chumash, and by 1834, when the missions were secularized, the Chumash population had declined dramatically as a result of European diseases (Grant, 1978).

Today, Chumash descendants live throughout southern and central California, with one federally recognized Chumash Tribe (the Santa Ynez Band of Chumash Indians), and several other tribal groups that do not currently have federal recognition. The Santa Ynez Reservation, home to the Santa Ynez Band of Chumash Indians, was established in 1901 (Santa Ynez Band, 2015). The reservation currently houses 249 residents.

4.4.1.4 Historic Context

In 1769, Gaspar de Portolá led an expedition from San Diego to the San Francisco Bay (McCawley, 1996). Because of this, the year 1769 is generally considered the beginning of the Historic Period in the region. The contingent skirted the southern foothills of the Simi Hills, entering the San Fernando Pass and heading northwest through the Santa Clara Valley. The Juan Bautista de Anza expedition followed the same southern route in 1774 and again in 1776 (Bevil, 2007). By the late 18th century, the Spanish established missions in California and were forcibly relocating and converting native peoples. The two missions closest to the project site were Mission San Fernando (established 1797), located about 12 miles to the east, and Mission San Buenaventura (established 1782), located about 30 miles to the west. Disease and hard labor took a toll on the native population in California; by 1900, the Native Californian population had

declined by as much as 90 percent (Cook, 1978). In addition, native economies were disrupted, trade routes were interrupted, and native ways of life were significantly altered.

In an effort to promote Spanish settlement of Alta California, Spain granted several large land concessions from 1784 to 1821. Two land grants were made in Ventura County: Rancho Simi (1795) and Rancho El Conejo (1802–1803) (Ventura County Genealogical Society, 2015). Rancho Simi consisted of 113,009 acres granted to Santiago Pico and a partner, Luis Pena. Rancho El Conejo consisted of 48,672 acres granted to Ygnacio Rodriguez and Jose Polanco.

In 1821, Spain lost control of its North American colony and the Republic of Mexico was founded. The Mexican government continued to promote settlement of Alta California with the issuance of land grants. In 1833, Mexico began the process of secularizing the missions, reclaiming the majority of mission lands and redistributing them as land grants (Pitt, 1994; Starr, 2007).

In 1846, the Mexican-American War broke out. Mexican forces were eventually defeated in 1847 and Mexico ceded California to the United States as part of the Treaty of Guadalupe Hildalgo in 1848. California officially became a state in 1850. Mexican landowners found it difficult to prove ownership in U.S. courts, and many former ranchos were subsequently subdivided and sold for agriculture and residential settlement (McWilliams, 1946).

The discovery of gold in northern California in 1848 resulted in a flood of settlers from other states and abroad. The first transcontinental railroad was completed in 1869, connecting San Francisco with the eastern United States, and more newcomers poured into northern California. Southern California experienced a trickle-down effect, as many of these newcomers made their way south. The second transcontinental line, the Santa Fe, was completed in 1886 and caused a fare war, driving fares to an unprecedented low and encouraging large numbers of people to immigrate to southern California. During the first three decades of the 20th century, more than 2 million people moved to southern California, transforming it from a largely agricultural region into a major metropolitan area (Starr, 2007).

History of the Project Vicinity

The project site is located in the Simi Hills of Ventura County, which was formed from a part of Santa Barbara County in 1873. The area was once part of the 113,009-acre Rancho Simi land grant given to Santiago Pico and a partner, Luis Pena, in 1795 (Ventura County Genealogical Society, 2015; Simi Valley Historical Society, 2015). Pico was a soldier in the Santa Barbara Company of the Spanish Army and grandfather to Pio Pico, the last Mexican governor of Alta California. Santiago Pico and his family came to Alta California with the Anza Expedition of 1775-1776 (NPS, 2015; Robinson, 1948; Strathearn Historical Park and Museum, 2015). Pico constructed a large adobe residence in the early 1800s on the site of a former Chumash village, Simi (Gordinier, 1988).

In 1832, the rancho was sold to a prominent local cattle rancher, Jose de la Guerra y Noriega, although the sale was not completed until 1842 (Kuhn, 2004; NPS, 2015). De la Guerra's claim was confirmed by the United States in 1854 and title given in 1865 (Kuhn, 2004). De la Guerra

was a Spanish soldier who served as commandant of the Presidio of Santa Barbara and was one of the largest landholders in California. In the 1850s to early 1860s, several thousand head of cattle grazed on the rancho along with smaller numbers of sheep, which were tended by local Chumash whom the family employed as vaqueros and sheepherders.

De la Guerra died in 1858, and his heirs were forced to mortgage the rancho after severe droughts in the 1860s decimated the cattle industry. The rancho was eventually lost to their lender, Isaac Cook (Kuhn, 2004; Smythe, 1908). Sale of Ranch Simi was ordered in 1863 by the District Court, Second Judicial District, State of California, County of Santa Barbara to pay off their $21,500 debt to Isaac Cook (Daily Alta California, Vol. 15, No. 4728, February 3, 1863).

The rancho changed hands many times in the late 19th century, but continued to be used primarily for cattle grazing. By 1890, the rancho was in the hands of the Simi Valley Land and Water Company, which subdivided and sold the land. The areas that would become part of SSFL were subdivided into Tract A and Tract P.

In 1918, Conrad C. and Adaline M. Lehman purchased 200 acres of Tract A (Oxnard Courier, August 9, 1918). The Lehmans later sold their property to Henry W. and Beulah Silvernale in 1939 (Oxnard Daily Courier, September 12, 1939). The Silvernales owned the 1,200-acre Sky Ranch (including the Burro Flats area).

Arthur L. and Ida M. Dundas moved from Oregon to California sometime in the late 1920s, settling in the Hancock Park area of Los Angeles (U.S. Census, 1930). The Dundas' acquired land in Tract A, which would become part of SSFL, at an unknown date. Arthur passed away in 1945, but Ida retained the title to the land until its sale in 1954 (State of California, 1945; TechLaw, 1990).

Santa Susana Pass

The Santa Susana Pass grew out of a former Indian trail and was first mentioned by Father Jose Senan of Mission San Buenaventura, who recognized that the pass might reduce travel time to Mission San Fernando (Bevil, 2007). By 1822, the pass had become an essential part of the trade, travel, and grazing route between Los Angeles and Santa Barbara, and it was widened to better accommodate *carretas* (ox-driven carts).

After California became part of the United States, the pass became an integral route for passengers, freight, and mail transport between Los Angeles and San Francisco, and several stage coach companies used the pass as part of their regular route. Stage coach stops included Mountain Station (also known as Larry's), which was located at the foot of the grade on the Ventura County side and afforded a place to stop and rest or change horses (Bevil, 2007). Notorious bandits Juan Flores and Tiburcio Vasquez are reputed to have used the pass as a hideout.

In 1859, the State contributed $15,000 to improve the road through the pass, with Los Angeles and Santa Barbara counties providing additional funds. The new road was completed in 1861 and was wide enough to allow a team of four horses pulling a wagon. The new road also reduced travel time between the coast and Los Angeles and supplanted El Camino Viejo (or El Camino Real) as the main route between Los Angeles and San Francisco. After the Southern Pacific

opened the San Fernando Tunnel in 1876, usage of the pass declined. Existing stage coach lines moved their route back to the coast route, and the pass was consigned to local traffic (Bevil, 2007).

The grade on the San Fernando Valley side of the pass was known as the Devil's Slide because of its steep decline. The grade was so steep that most passengers opted to walk rather than ride in the wagon, and would assist the horses by putting large rocks under the rear wheels to prevent backsliding on the ascent. Drivers supplemented the brakes through the use of chains or placing timber between the rear spokes to help control descent. In 1895, Devil's Slide was abandoned when a bypass was constructed to the north (known as El Camino Nuevo or Chatsworth Grade Road), which was itself bypassed in 1917 when a new asphalt-paved road (Santa Susana Pass Grade Road) was constructed to facilitate automobile traffic (Bevil, 2007).

Southern Pacific Railroad

The Southern Pacific Railroad constructed a line north of the Simi Hills in the early 1900s. In 1876, the railroad had opened a tunnel through the Newhall Pass northwest of San Fernando to connect Los Angeles with San Francisco; however, the railroad sought an easier passage over the mountain ranges. Access to a coastal right-of-way was denied, and the railroad opted to construct a new tunnel through the Santa Susana Mountains (located about 2.5 miles northeast of the project site) (Amtrak, 2014). The Santa Susana Depot was constructed in 1903 to serve Simi Valley farmers (santasusannadepot.org, 2015).

Movies

The project site and its vicinity was once a preferred location for filming, and several Hollywood studios shot westerns and films that were set in exotic locations in the area, given the rugged nature of the valleys, canyons, and foothills. "Movie ranches" were established generally within 30 miles of Los Angeles (known as the "Studio Zone") to avoid paying travel expenses to union workers. Movie ranches in the vicinity of the project site include: Bell Moving Picture Ranch; Big Sky Movie Ranch; Corriganville; Iverson Ranch; and Spahn Ranch. In addition, the Burro Flats area was often used for filming (Schneider, 2011). With the post-WWII population boom, most of the ranches were subdivided for tract housing. Only Big Sky Movie Ranch is still in operation today.

Aerospace Industry

In 1946, North American Aviation (NAA) (a predecessor of the Boeing Company) received a contract from the U.S. Air Force to develop surface-to-surface supersonic MX-770 Navaho Missiles and the company began its search for a suitable test location. The NAA finally decided on an area in the Simi Hills and leased 2,100 acres from Ida Dundas. In 1954, the NAA purchased the land for $300 per acre, and also acquired 840 acres in the west from the Silvernales. In 1968, NAA Rockwell acquired about 1,000 acres from Spruce Land Corporation (part of Tract P of Rancho Simi) to form the southern buffer zone (Bryne, 2012; TechLaw, 1990).

Known as "The Hill," SSFL became the center of development and testing for aerospace and defense-related systems in the 1950s (Bryne, 2012; Post et al., 2009). Rocketdyne (a former division of NAA) used the area to test and develop several liquid-propellant rocket engine systems used in Redstone, Thor, Jupiter, Delta, Atlas, and Saturn rockets, and for the main propulsion system of the Space Shuttle. Between 1954 and 1957, NAA constructed the Alfa, Bravo, Coca, and Delta test stands in Area II. Testing of rocket engines ceased in 2006 (Bryne, 2012). Area IV was also the site of nuclear reactor testing and development from the 1950s to the 1980s. A partial nuclear reactor meltdown occurred in 1959 when a blockage from a contaminating fluid in the coolant system caused 13 of the 43 nuclear rods to melt (Vincent, 2011). Testing for nuclear energy ceased in 1988 (Bryne, 2012). All testing at SSFL ceased in 2006, and several test stands were dismantled (USEPA, 2015; Vincent, 2011).

4.4.1.5 Cultural Resources Located Within the Project Site

Archaeological Resources

Previous Studies

Although numerous archaeological studies have been completed within the project site, this analysis relies on the most recent and comprehensive studies, which are summarized below.

Most archaeological studies within the project site were completed within the last 10 years and consisted solely of Phase I pedestrian surveys. However, the Burro Flats Site Complex (formerly consisting of archaeological site CA-VEN-1072) has been subject to numerous studies and is discussed separately below.

Burro Flats Site Complex

The Burro Flats Site Complex, formerly recorded as archaeological site CA-VEN-1072 and located in Area II, Area III, and the Southern Undeveloped Area within the project site, is one of the most well-known sites in the Simi Hills. It was visited in the 1940s by archaeologist Mark Raymond Harrington, and then in the 1950s by Charles La Monk as part of work with the Archaeological Survey Association of Southern California. La Monk created full-sized painted reproductions of some of the pictographs (Bryne, 2012). The first site records were created by Charles Rozaire in 1960, who documented the site as 11 separate loci (CA-VEN-151 to -161). Rozaire also oversaw excavations by San Fernando State College, but no excavation report was ever published. Franklin Fenenga conducted a survey of the site in 1973, but did not use Rozaire's site designations.

The Burro Flats Site Complex played a large role in John Romani's master thesis research, which focused on Chumash and Fernandeño astronomy and ceremonialism. Romani believed that the village of Huwam (CA-LAN-413) was the host village for a regional winter solstice festival, and that the Burro Flats Site Complex was a ceremonial site related to the solstice ceremonies (Romani, 1981). In the 1990s, Albert Knight surveyed the site, discovered several new loci, and combined all loci, which had previously been assigned separate trinomials, under the trinomial CA-VEN-1072 (Knight, 2012). The site has been revisited and updated several times in the past decade, including in 2007, when CH2M Hill rerecorded the loci located within Area II; in 2013, when a new locus, designated CA-VEN-1072 West, was recorded; and in 2014, when Corbett et al. re-recorded the site as 22 individual sites (CA-VEN-151/157, -152/161, -153/156, -154/155, -158, -159/160, -1065, -1066, -1067, -1068, -1072 West, -1072 Locus 5, -1072 Locus 6, -1072 Locus 12, -1072 Locus 15 -1072 Locus 20, -1072 Locus 23, -1072 Locus 24, -1072 Locus 31, -1823, -1824, and -1825) that form a larger site complex (CH2M Hill, 2014; Corbett and Guttenberg, 2014; Corbett et al., 2014).

Area I, Area III, and the Southern Undeveloped Area

In 2013–2014, John Minch and Associates (JMA) completed a pedestrian survey of Area I, Area III, and the Southern Undeveloped Area (Corbett, 2014). Surveyors walked transects averaging approximately 10 meters wide throughout most of the area, with minor variations to adjust for topography or areas of dense vegetation or higher archaeological sensitivity. As a result of the survey, 59 new archaeological sites (including 55 prehistoric sites and four historic-era sites) and 63 new prehistoric isolates were recorded.

Area I (NASA) and Area II

The most recent archaeological survey of Area II and NASA's portion of Area I was conducted in 2014 by JMA (Corbett et al., 2014). Surveyors used transects of 10 meters, adjusting transect width to accommodate terrain and visibility. As a result of the survey, 41 new archaeological sites and 17 new isolates were recorded and 17 previously recorded sites were recorded. JMA also redefined the boundaries of site CA-VEN-1072, dividing the site, which had been previously combined into one large archaeological site, into 22 individual sites that together constituted a site complex (referred to as the Burro Flats Site Complex).

Area IV and Northern Undeveloped Area

The Northern Undeveloped Area was surveyed in 2010 by CRM Tech (Hogan and Tang, 2010). As a result of the survey, three prehistoric archaeological sites and five prehistoric isolates were recorded.

Area IV was subject to systematic pedestrian archaeological survey in 2001 by W&S Consultants; as a result of this survey, three prehistoric archaeological sites and one archaeological site of unknown cultural affiliation or date were recorded (W&S, 2001).

Between July 2010 and August 2012, JMA conducted archaeological monitoring for a USEPA radiological characterization study for portions of Area IV and the Northern Undeveloped Area (Corbett et al., 2012). Activities subject to monitoring by archaeological and Native American monitors included gamma scanning, soil sampling, surface water and sediment sampling, mobilization and staging, access improvement, and vegetation removal or alteration. Known archaeological sites were flagged and avoided during project activities. As a result of monitoring, 19 new prehistoric archaeological sites and 17 new prehistoric isolates were identified within Area IV, and seven new prehistoric archaeological sites and 37 new prehistoric isolates were identified within the Northern Undeveloped Area (Corbett et al., 2012).

Between 2011 and 2014, Leidos conducted archaeological survey, site verification, and monitoring during the Phase 3 soil chemical sampling in Area IV and the Northern Undeveloped Area (Bryne, 2014). Activities monitored included excavation of 1,350 surface and subsurface sampling and excavation of 19 geological test pits and trenches. Prior to excavation of samples, the work areas were systematically surveyed by a Leidos archaeologist and all previously recorded sites were revisited by an archaeologist and their boundaries mapped. Known sites were avoided during sampling. As a result of survey and monitoring, two prehistoric isolates were identified and updates to three previously recorded archaeological sites were completed (Bryne, 2014). Excavation of surface and subsurface sampling was monitored by Native American monitors, while excavation of test pits and trenches was monitored by Native American and archaeological monitors.

Although the monitoring that occurred in Area IV and the Northern Undeveloped Area between 2010 and 2014 was not methodologically equivalent to systematic pedestrian survey, the vegetation clearance combined with the intensive scrutiny by monitors within the geographic areas in which they were working could have resulted in a similar level of cultural resource discovery. In addition, the sampling activities that were monitored covered a large area within Area IV and the Northern Undeveloped Area.

In 2015, Leidos conducted Extended Phase I testing at ten sites (CA-VEN-1302, -1412, -1414, -1416, -1418, -1420, -1428, -1772, -1773, and -1775) in Area IV, in order to delineate site boundaries and evaluate their eligibility for listing in the National Register of Historic Places (NRHP) (Leidos, 2015). Shovel Test Pits (STPs) and 1 meter by 1 meter test excavation units were excavated at each site. Eight of the ten sites (CA-VEN-1302, -1412, -1414, -1416, -1418, -1772, -1773, and -1775) were recommended eligible for listing in the NRHP under Criterion D, based on the presence of intact subsurface deposits, datable materials, or research potential. Two sites (CA-VEN-1420 and -1428) were recommended ineligible for listing in the NRHP based on a lack of site integrity and an inability to contribute important information to the study of prehistory. The resources were not evaluated for their eligibility for listing in the California Register of Historical Resources (CRHR).

Archaeological Resources Within the Project Site

As a result of these described cultural resources investigations, a total of 144 archaeological sites (defined for the purpose of this project as three or more artifacts in an open-air context, or one or more artifact(s) located within a rockshelter) and 136 isolates (defined for the purpose of this

project as two or fewer artifacts not located within a rockshelters) are located within or immediately adjacent to the project site. This count includes six archaeological sites that are located outside of the project site, but are located near enough to the project site that potential direct or indirect project impacts could occur. Of the archaeological sites, 132 are prehistoric, six are historic-period, and six are multicomponent (meaning that they contain both historic and prehistoric components). All of the isolates are prehistoric. **Table 4.4-1** summarizes the sites and isolates within the project site.

To date, very few of the 144 archaeological sites within the project site have been evaluated for listing in the NRHP or CRHR. One major exception to this is the Burro Flats Site Complex, portions of which are listed in the NRHP and CRHR. In 1976, the "Burro Flats Painted Caves," consisting of Rozaire's original eleven sites (CA-VEN-151 through -161), was listed in the NRHP, and therefore listed in the CRHR as well. Since that time, the original 11 sites have been consolidated into six sites (CA-VEN-151/157, -152/161, -153/156, -154/155, -158, and -159/160), and Burro Flats Site Complex has been expanded and recorded as 22 separate sites that constitute an archaeological site complex (CA-VEN-151/157, -152/161, -153/156, -154/155, -158, -159/160, -1065, -1066, -1067, -1068, -1072 West, -1072 Locus 5, -1072 Locus 6, -1072 Locus 12, -1072 Locus 15 -1072 Locus 20, -1072 Locus 23, -1072 Locus 24, -1072 Locus 31, -1823, -1824, and -1825) (Corbett and Guttenberg, 2014; Corbett et al., 2014). The sites that have been added to the Burro Flats Site Complex since its original listing in the NRHP in 1976 are likewise considered eligible for listing in the NRHP and CRHR.

In addition to the Burro Flats Site Complex, several sites in Area IV have been evaluated for significance. As a result of the Extended Phase I testing conducted in Area IV in 2015, eight sites (CA-VEN-1302, -1412, -1414, -1416, -1418, -1772, -1773, and -1775) were recommended eligible for listing in the NRHP under Criterion D, based on the presence of intact subsurface deposits, datable materials, or research potential (Bryne, 2015). Two sites (CA-VEN-1420 and -1428) were recommended ineligible for listing in the NRHP based on a lack of site integrity and an inability to contribute important information to the study of prehistory. The Extended Phase I study did not formally evaluate these resources for their eligibility for listing in the CRHR; however, for the purposes of this analysis, the resources evaluated as eligible for the NRHP are likewise considered eligible for listing in the CRHR. Similarly, the resources recommended not eligible for the NRHP are likewise considered not eligible for the CRHR and are not historical resources or unique archaeological resources under CEQA.

Resources CA-VEN-1800 and -1803, which are located within Area II, have not been formally evaluated for significance; however, they are being treated as eligible for listing in the NRHP by NASA as part of their NEPA environmental review and Section 106 consultation.

Because of their isolated nature and lack of clear cultural context, the 136 isolates are not considered individually eligible for inclusion in the NRHP or CRHR, nor do they qualify as historical resources or unique archaeological resources under CEQA.

TABLE 4.4-1
ARCHAEOLOGICAL RESOURCES WITHIN THE PROJECT SITE

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
CA-VEN-151/157*	-	SSFL Area II/Liquid Oxygen Plant Survey Site Ven-151/157	Prehistoric	Site	Area II	Rockshelter with pictograph panels, dense midden, and bedrock features. Part of the Burro Flats Site Complex.	Listed in the NRHP
CA-VEN-152/161*	-	SSFL Area II/Liquid Oxygen Plant Survey Site Ven-152/161	Prehistoric	Site	Area II	Rockshelter with a pictograph panel and hearth feature, and associated midden and lithics. Part of the Burro Flats Site Complex.	Listed in the NRHP
CA-VEN-153/156*	-	SSFL Area II/Liquid Oxygen Plant Survey Site Ven-153/156	Prehistoric	Site	Area II	Rockshelter with polychrome pictograph panels, cupule features, and associated midden and lithics. Part of the Burro Flats Site Complex.	Listed in the NRHP
CA-VEN-154/155*	-	SSFL Area II/Liquid Oxygen Plant Survey Site Ven-154/155	Prehistoric	Site	Area II	Cupule boulder/shadow rock with “Bearpaw” bedrock milling features and associated midden. Part of the Burro Flats Site Complex.	Listed in the NRHP
CA-VEN-158*	-	SSFL Area II/Liquid Oxygen Plant Survey Site Ven-158	Prehistoric	Site	Area II	Rockshelter with pictographs and a small associated lithic scatter. Part of the Burro Flats Site Complex.	Listed in the NRHP
CA-VEN-159/160*	-	SSFL Area II/Liquid Oxygen Plant Survey Site Ven-159/160	Prehistoric	Site	Area II	Two rockshelters with polychrome pictograph panels, cupules, and associated midden and lithics. Part of the Burro Flats Site Complex.	Listed in the NRHP
CA-VEN-730	56-000730	-	Prehistoric	Site	Offsite	Rockshelter with groundstone, lithic tool, midden	Not evaluated
CA-VEN-763	56-000763	-	Prehistoric	Site	Offsite	Rockshelter with fire ring, lithic scatter, lithic tools, basalt bowl fragment	Not evaluated
CA-VEN-764	56-000764	-	Prehistoric	Site	Offsite	Rockshelter with midden, lithic scatter, lithic tools, groundstone, black chert projectile point, burnt mammal bones	Not evaluated
CA-VEN-1065*	56-001065	SSFL Area II/Liquid Oxygen Plant Survey Site Ca-Ven-1065	Prehistoric	Site	Area II	Rockshelter with pictographs, prehistoric artifact scatter. Part of the Burro Flats Site Complex.	Eligible for listing in the NRHP

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
CA-VEN-1066*	56-001066	SSFL Area II/Liquid Oxygen Plant Survey Site Ca-Ven-1066	Prehistoric	Site	Area II	Rockshelter with a pictograph panel and associated lithics. Part of the Burro Flats Site Complex.	Eligible for listing in the NRHP
CA-VEN-1067*	56-001067	SSFL Area II/Liquid Oxygen Plant Survey Site Ca-Ven-1067	Prehistoric	Site	Area II	Possible trail. Part of the Burro Flats Site Complex.	Eligible for listing in the NRHP
CA-VEN-1068*	56-001068	SSFL Area II/Liquid Oxygen Plant Survey Site Ca-Ven-1068	Prehistoric	Site	Area II	Rockshelter with bedrock mortars and cupules. Part of the Burro Flats Site Complex.	Eligible for listing in the NRHP
CA-VEN-1072 West*	-	CA-VEN-1072 West	Prehistoric	Site	Southern Undeveloped Area	Open- air site with lithic artifacts, midden, mammal bone, some observed in cut bank. Part of the Burro Flats Site Complex.	Eligible for listing in the NRHP
CA-VEN-1119	56-001119	-	Prehistoric	Site	Former Rocketdyne Employee Shooting Range	Two bedrock mortars and one cupule.	Not evaluated
CA-VEN-1302	56-001302	SCE Fiber Optic #3	Prehistoric	Site	Area III, Area IV	Open-air lithic scatter with faunal remains, hearth.	Recommended eligible for listing in the NRHP
CA-VEN-1303	56-001303	SCE Fiber Optic #4	Historic	Site	Area III	Concrete and masonry walls.	Not evaluated
CA-VEN-1355	56-001355	SSFL 1.18.10 Project Site 1	Prehistoric	Site	Area IV	Marine shell; possibly modern.	Not evaluated
CA-VEN-1411	56-001411	SSFL 9.8.10 Project Site 3	Prehistoric	Site	Area III, Area IV	Rockshelter with midden and large lithic scatter.	Not evaluated
CA-VEN-1412	56-001412	SSFL 9.14.10 Project Site 4	Prehistoric	Site	Area IV	Rockshelter with groundstone and faunal remains.	Recommended eligible for listing in the NRHP
CA-VEN-1413	56-001413	SSFL 11.2.10 Project Site 8	Prehistoric	Site	Area III/Area IV	Rockshelter with midden, pictographs, bedrock mortars, FAR, projectile point, burned bone, shell.	Not evaluated
CA-VEN-1414	56-001414	SSFL 1.5.11 Project Site 9	Prehistoric	Site	Area IV	Rockshelter with lithics and bedrock mortar.	Recommended eligible for listing in the NRHP
CA-VEN-1415	56-001415	SSFL 10.11.10 Project Site 10	Prehistoric	Site	Area IV	Lithic scatter.	Not evaluated
CA-VEN-1416	56-001416	SSFL 1.14.11 Project Site 11	Prehistoric	Site	Area IV	Rockshelter with lithic scatter, projectile points, and faunal remains.	Recommended eligible for listing in the NRHP

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
CA-VEN-1417	56-001417	SSFL 1.17.11 Project Site 12	Prehistoric	Site	Area III, Area IV	Rockshelter with FAR and lithic scatter.	Not evaluated
CA-VEN-1418	56-001418	SSFL 2.9.11 Project Site 13	Prehistoric	Site	Area IV	Rockshelter with lithic scatter.	Recommended eligible for listing in the NRHP
CA-VEN-1419	56-001419	SSFL 2.24.11 Project Site 15	Prehistoric	Site	Area IV/Northern Undeveloped Area	Open-air lithic scatter.	Not evaluated
CA-VEN-1420	56-001420	SSFL 6.6.11 Project Site 17	Prehistoric	Site	Area IV	Open-air lithic scatter.	Recommended not eligible for listing in the NRHP
CA-VEN-1421	56-001421	SSFL 9.9.11 Project Site 18	Prehistoric	Site	Northern Undeveloped Area	Rockshelter with lithic scatter.	Not evaluated
CA-VEN-1422	56-001422	SSFL 10.12.11 Project Site 19	Prehistoric	Site	Northern Undeveloped Area	Rockshelter with lithic scatter.	Not evaluated
CA-VEN-1423	56-001423	SSFL 12.2.11 Project Site 20	Prehistoric	Site	Northern Undeveloped Area	Rockshelter with stacked stone feature.	Not evaluated
CA-VEN-1424	56-001424	SSFL 12.9.11 Project Site 21	Prehistoric	Site	Offsite	Rockshelter with lithic scatter.	Not evaluated
CA-VEN-1425	56-001425	SSFL 4.3.12 Project Site 22	Prehistoric	Site	Northern Undeveloped Area	Rockshelter with lithic scatter.	Not evaluated
CA-VEN-1426	56-001426	SSFL 4.17.12 Project Site 23	Prehistoric	Site	Northern Undeveloped Area	Rockshelter with lithic scatter.	Not evaluated
CA-VEN-1427	56-001427	SSFL 4.23.12 Project Site 24	Prehistoric	Site	Northern Undeveloped Area	Rockshelter with lithic scatter and faunal remains.	Not evaluated
CA-VEN-1428	56-001428	SSFL 4.14.11 Project Site 16	Prehistoric	Site	Area IV	Open-air lithic scatter.	Recommended not eligible for listing in the NRHP
CA-VEN-1433	56-001433	Boeing Site 1	Prehistoric	Site	Southern Undeveloped Area	Open-air lithic scatter.	Not evaluated
CA-VEN-1434	56-001434	Boeing Site 2	Prehistoric	Site	Southern Undeveloped Area	Rockshelter with lithic scatter.	Not evaluated
CA-VEN-1435	56-001435	Boeing Site 3	Prehistoric	Site	Southern Undeveloped Area	Rockshelter with 3 pictograph panels and lithic scatter.	Not evaluated

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
CA-VEN-1436	56-001436	Boeing Site 4	Prehistoric	Site	Southern Undeveloped Area	Rockshelter with arrow straightener.	Not evaluated
CA-VEN-1437	56-001437	Boeing Site 5	Prehistoric	Site	Southern Undeveloped Area	Open-air lithic scatter.	Not evaluated
CA-VEN-1438	56-001438	Boeing Site 6	Prehistoric	Site	Southern Undeveloped Area	Rockshelter with lithic scatter.	Not evaluated
CA-VEN-1439	56-001439	Boeing Site 7	Prehistoric	Site	Southern Undeveloped Area	Open-air lithic scatter.	Not evaluated
CA-VEN-1440	56-001440	Boeing Site 8	Multi-Component	Site	Southern Undeveloped Area	Rockshelter with stacked rock feature and historic artifact.	Not evaluated
CA-VEN-1441	56-001441	Boeing Site 10	Prehistoric	Site	Southern Undeveloped Area	Rockshelter with faunal remains.	Not evaluated
CA-VEN-1442	56-001442	Boeing Site 12	Prehistoric	Site	Southern Undeveloped Area	Open-air lithic scatter.	Not evaluated
CA-VEN-1443	56-001443	Boeing Site 13	Historic	Site	Area III	Rockshelter with historic etchings.	Not evaluated
CA-VEN-1444	56-001444	Boeing Site 14	Prehistoric	Site	Area I (Boeing)	Rockshelter with lithic scatter.	Not evaluated
CA-VEN-1445	56-001445	Boeing Site 15	Prehistoric	Site	Southern Undeveloped Area	Rockshelter with quartzite core.	Not evaluated
CA-VEN-1446	56-001446	Boeing Site 16	Prehistoric	Site	Southern Undeveloped Area	Open-air lithic scatter.	Not evaluated
CA-VEN-1447	56-001447	Boeing Site 18	Prehistoric	Site	Area I (Boeing)	Open-air lithic scatter.	Not evaluated
CA-VEN-1448	56-001448	Boeing Site 19	Prehistoric	Site	Southern Undeveloped Area	Rockshelter with stacked rock feature and asphaltum fragment with basketry impression.	Not evaluated
CA-VEN-1450	56-001450	Boeing Site 20	Prehistoric	Site	Southern Undeveloped Area	Open-air lithic scatter.	Not evaluated

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
CA-VEN-1451	56-001451	Boeing Site 22	Prehistoric	Site	Area I (Boeing)	Rockshelter with bone and lithics.	Not evaluated
CA-VEN-1453	56-001453	Boeing Site 23	Prehistoric	Site	Area I (Boeing)	Rockshelter with lithic scatter.	Not evaluated
CA-VEN-1454	56-001454	Boeing Site 24	Prehistoric	Site	Area I (Boeing)	Rockshelter with lithic scatter.	Not evaluated
CA-VEN-1458	56-001458	Boeing Site 25	Prehistoric	Site	Area I (Boeing)	Open-air lithic scatter.	Not evaluated
CA-VEN-1459	56-001459	Boeing Site 26	Prehistoric	Site	Area I (Boeing)	Rockshelter with cake of asphaltum.	Not evaluated
CA-VEN-1461	56-001461	Boeing Site 27	Prehistoric	Site	Area I (Boeing)	Open-air lithic scatter.	Not evaluated
CA-VEN-1462	56-001462	Boeing Site 28	Multi-Component	Site	Area I (Boeing)	Lithic scatter with historic ammunition round.	Not evaluated
CA-VEN-1463	56-001463	Boeing Site 9	Prehistoric	Site	Southern Undeveloped Area	Two rockshelters with lithics.	Not evaluated
CA-VEN-1464	56-001464	Boeing Site 11	Prehistoric	Site	Southern Undeveloped Area	Rockshelter with two groundstone fragments.	Not evaluated
CA-VEN-1465	56-001465	Boeing Site 17	Prehistoric	Site	Offsite	Rockshelter with shell fragment and looter's screen.	Not evaluated
CA-VEN-1466	56-001466	Boeing Site 21	Multi-Component	Site	Southern Undeveloped Area	Rockshelter with modern camping gear and open-air lithic scatter.	Not evaluated
CA-VEN-1467	56-001467	Boeing Site 29	Prehistoric	Site	Area I (Boeing)	Open-air lithic scatter.	Not evaluated
CA-VEN-1468	56-001468	Boeing Site 32	Prehistoric	Site	Area I (Boeing)	Rockshelter with lump of asphaltum.	Not evaluated
CA-VEN-1469	56-001469	Boeing Site 34	Prehistoric	Site	Area III	Open-air lithic scatter.	Not evaluated
CA-VEN-1470	56-001470	Boeing Site 35	Prehistoric	Site	Area III	Open-air lithic scatter with two loci.	Not evaluated
CA-VEN-1471	56-001471	Boeing Site 36	Prehistoric	Site	Area III	Extensive site with lithic scatter, rockshelters, bedrock mortar.	Not evaluated
CA-VEN-1472	56-001472	Boeing Site 37	Prehistoric	Site	Area III	Rockshelter with flake, mammal bone, looter's screen, pictograph.	Not evaluated

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
CA-VEN-1473	56-001473	Boeing Site 38	Prehistoric	Site	Southern Undeveloped Area	Open-air lithic scatter and quarry.	Not evaluated
CA-VEN-1474	56-001474	Boeing Site 40	Prehistoric	Site	Area III	Open-air lithic scatter.	Not evaluated
CA-VEN-1475	56-001475	Boeing Site 42	Prehistoric	Site	Area III	Open-air lithic scatter.	Not evaluated
CA-VEN-1476	56-001476	Boeing Site 43	Prehistoric	Site	Area III	Rockshelter with lithic scatter, vulva-shaped rock outcrop, possible footpath.	Not evaluated
CA-VEN-1477	56-001477	Boeing Site 44	Prehistoric	Site	Area III	Rockshelter with pictographs, prehistoric artifact scatter.	Not evaluated
CA-VEN-1478	56-001478	Boeing Site 46	Prehistoric	Site	Area III	Rockshelter with lithic artifact.	Not evaluated
CA-VEN-1479	56-001479	Boeing Site 48	Multi-Component	Site	Area III	Lithic scatter, rockshelter, pictograph, and historic bottle.	Not evaluated
CA-VEN-1480	56-001480	Boeing Site 49	Prehistoric	Site	Area III	Open-air lithic scatter.	Not evaluated
CA-VEN-1482	56-001482	Boeing Site 51	Prehistoric	Site	Area III	Rockshelter with pictograph.	Not evaluated
CA-VEN-1483	56-001483	Boeing Site 52	Prehistoric	Site	Area III	Open-air lithic scatter with three concentrations.	Not evaluated
CA-VEN-1484	56-001484	Boeing Site 53	Prehistoric	Site	Area I (Boeing)	Three rockshelters with basketry fragments, lithic artifact.	Not evaluated
CA-VEN-1485	56-001485	Boeing Site 54	Prehistoric	Site	Area I (Boeing)	Rockshelters with lithic artifact.	Not evaluated
CA-VEN-1486	56-001486	Boeing Site 55	Prehistoric	Site	Area II	Two rockshelters with rock art, lithic scatter, ground stone, burned bone, and Fire Affected Rock (FAR).	Not evaluated
CA-VEN-1487	56-001487	Boeing Site 56	Multi-Component	Site	Area III	Lithic artifact and two inscriptions on a boulder: one historic, the other of unknown origin	Not evaluated
CA-VEN-1488	56-001488	Boeing Site 57	Historic	Site	Area I (Boeing)	Historic-era inscriptions on boulder.	Not evaluated
CA-VEN-1489	56-001489	Boeing Site 58	Prehistoric	Site	Area III	Rockshelter with pictographs, lithic scatter, possible midden, and hearth.	Not evaluated
CA-VEN-1490	56-001490	Boeing Site 59	Prehistoric	Site	Area I (Boeing)	Rockshelter with lithic artifact and modern debris.	Not evaluated

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
CA-VEN-1491	56-001491	Boeing Site 60	Historic	Site	Area I (Boeing)	Boulder with historic inscription.	Not evaluated
CA-VEN-1492	56-001492	Boeing Site 61	Prehistoric	Site	Southern Undeveloped Area	Rockshelter with lithic scatter.	Not evaluated
CA-VEN-1493	56-001493	Boeing Site 62	Prehistoric	Site	Southern Undeveloped Area	Rockshelter with asphaltum and shell fragment.	Not evaluated
CA-VEN-1494	56-001494	Boeing Site 63	Prehistoric	Site	Southern Undeveloped Area	Open-air lithic scatter.	Not evaluated
CA-VEN-1495	56-001495	Boeing Site 64	Prehistoric	Site	Southern Undeveloped Area	Open-air lithic scatter.	Not evaluated
CA-VEN-1496	56-001496	Boeing Site 65	Prehistoric	Site	Area I (Boeing)	Open-air lithic scatter.	Not evaluated
CA-VEN-1497	56-001497	Boeing Site 45	Prehistoric	Site	Area III	Rockshelter with lithic scatter.	Not evaluated
CA-VEN-1772	56-001772	SSFL-1	Multi-component	Site	Area IV	Rockshelter with "pink burro" pictograph and modern graffiti; lithic scatter.	Recommended eligible for listing in the NRHP
CA-VEN-1773	56-001773	SSFL-2	Prehistoric	Site	Area IV	Rockshelter with lithic scatter.	Recommended eligible for listing in the NRHP
CA-VEN-1774	56-001774	SSFL-3	Prehistoric	Site	Area IV	Bedrock mortar.	Not evaluated
CA-VEN-1775	56-001775	SSFL-4	Prehistoric	Site	Area IV	Rockshelter with midden, groundstone, bedrock mortar, marine shell, and lithics.	Recommended eligible for listing in the NRHP
CA-VEN-1800	56-001800	CH-1	Prehistoric	Site	Area II	Rockshelter with rock art, and lithic scatter.	Treated as eligible for the NRHP
CA-VEN-1803	56-001803	CRM Tech 2433-2	Prehistoric	Site	Northern Undeveloped Area	Open-air lithic scatter.	Treated as eligible for the NRHP
CA-VEN-1804	56-001804	-	Prehistoric	Site	Northern Undeveloped Area	Open-air lithic scatter and bedrock mortars.	Not evaluated
CA-VEN-1805	56-001805	-	Prehistoric	Site	Northern Undeveloped Area	Open-air lithic scatter and water basin.	Not evaluated

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
CA-VEN-4378/H	56-004378	Boeing Site 31	Historic	Site	Offsite	Historic habitation site with concrete slab, stone foundation, refuse concentration, and brick and mortar wall rubble concentration.	Not evaluated
CA-VEN-1809	56-001809	1	Prehistoric	Site	Area II	Rockshelter with faunal material.	Not evaluated
CA-VEN-1810	56-001810	2	Prehistoric	Site	Area II	Open air lithic scatter.	Not evaluated
CA-VEN-1811	56-001811	3	Prehistoric	Site	Area II	Rockshelter with lithics, asphaltum, and mammal bone.	Not evaluated
CA-VEN-1812	56-001812	4	Prehistoric	Site	Area II	Rockshelter with lithics.	Not evaluated
CA-VEN-1072 locus 5	56-001812	5*	Prehistoric	Site	Area II	Steatite vessel fragment, lithics. Part of the Burro Flats Site Complex.	Eligible for listing in the NRHP
CA-VEN-1072 locus 6	56-001072	6*	Prehistoric	Site	Area II	Rockshelter with lithic scatter.	Eligible for listing in the NRHP
CA-VEN-1813	56-001813	7	Prehistoric	Site	Area II	Two rockshelters with a lithic scatter.	Not evaluated
CA-VEN-1814	56-001814	8	Prehistoric	Site	Area II	Rockshelter with shell, asphaltum.	Not evaluated
CA-VEN-1815	56-001815	9	Prehistoric	Site	Area II	Rockshelter with chert flake.	Not evaluated
CA-VEN-1816	56-001816	10	Prehistoric	Site	Area I	Rockshelter with tested cobble.	Not evaluated
CA-VEN-1817	56-001817	11	Prehistoric	Site	Area II	Rockshelter with flake.	Not evaluated
CA-VEN-1072 locus 12	56-001072	12*	Prehistoric	Site	Area II	Rockshelter with a pictograph panel, midden, and flake. Part of the Burro Flats Site Complex.	Eligible for listing in the NRHP
CA-VEN-1818	56-001818	13	Prehistoric	Site	Area II	Rockshelter with associated lithic artifacts.	Not evaluated
CA-VEN-1819	56-001819	14	Prehistoric	Site	Area II	Open air lithic scatter.	Not evaluated
CA-VEN-1072 locus 15	56-001072	15*	Prehistoric	Site	Area II	Rockshelter with a pictograph panel, lithic artifacts. Part of the Burro Flats Site Complex.	Eligible for listing in the NRHP

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
CA-VEN-1841	56-001841	16	Prehistoric	Site	Area II	Open air lithic scatter.	Not evaluated
CA-VEN-1820	56-001820	17	Prehistoric	Site	Area II	Rockshelter with mammal bone, lithic artifacts.	Not evaluated
CA-VEN-1821	56-001821	18	Prehistoric	Site	Area II	Open air lithic scatter.	Not evaluated
CA-VEN-1822	56-001822	19	Prehistoric	Site	Area II	Open air lithic scatter.	Not evaluated
CA-VEN-1072 locus 20	56-001072	20*	Prehistoric	Site	Area II	Rockshelter with midden, lithic artifacts, cupules. Part of the Burro Flats Site Complex.	Eligible for listing in the NRHP
CA-VEN-1823	56-001823	21*	Prehistoric	Site	Area II	Rockshelter with a pictograph panel, lithic artifacts, bone awl. Part of the Burro Flats Site Complex.	Eligible for listing in the NRHP
CA-VEN-1824	56-001824	22*	Prehistoric	Site	Area II	Rockshelter with a pictograph panel, bedrock mortar, lithic artifacts. Part of the Burro Flats Site Complex.	Eligible for listing in the NRHP
CA-VEN-1072 locus 23	56-001072	23*	Prehistoric	Site	Area II	Open air lithic scatter with burned mammal bone. Part of the Burro Flats Site Complex.	Eligible for listing in the NRHP
CA-VEN-1072 locus 24	56-001072	24*	Prehistoric	Site	Area II	Open air lithic scatter. Part of the Burro Flats Site Complex.	Eligible for listing in the NRHP
CA-VEN-1825	56-001825	25*	Prehistoric	Site	Area II	Open air lithic scatter. Part of the Burro Flats Site Complex.	Eligible for listing in the NRHP
CA-VEN-1826	56-001826	26	Prehistoric	Site	Area II	Rockshelter with chopper.	Not evaluated
CA-VEN-1827	56-001827	27	Prehistoric	Site	Area II	Rockshelter with quartzite cobble.	Not evaluated
CA-VEN-1828	56-001828	28	Prehistoric	Site	Area II	Rockshelter with quartzite flake.	Not evaluated
CA-VEN-1829	56-001829	29	Prehistoric	Site	Area II	Rockshelter with basketry.	Not evaluated
CA-VEN-1830	56-001830	30	Prehistoric	Site	Area I	Rockshelter with asphaltum.	Not evaluated
CA-VEN-1072 locus 31	56-001072	31*	Prehistoric	Site	Area II	Open air lithic scatter with bedrock mortars. Part of the Burro Flats Site Complex.	Eligible for listing in the NRHP

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
CA-VEN-1831	56-001831	32	Prehistoric	Site	Area I (Liquid Oxygen Plant)	Rockshelter with lithic artifacts.	Not evaluated
CA-VEN-1832	56-001832	33	Prehistoric	Site	Area I (Liquid Oxygen Plant)	Open air lithic scatter.	Not evaluated
CA-VEN-1833	56-001833	34	Prehistoric	Site	Area I (Liquid Oxygen Plant)	Open air lithic scatter with bird bone.	Not evaluated
CA-VEN-1834	56-001834	35	Prehistoric	Site	Area I (Liquid Oxygen Plant)	Open air lithic scatter.	Not evaluated
CA-VEN-1835	56-001835	36	Prehistoric	Site	Area II	Rockshelter with lithic artifacts.	Not evaluated
CA-VEN-1836	56-001836	37	Prehistoric	Site	Area II	Rockshelter with asphaltum, lithic artifacts.	Not evaluated
CA-VEN-1837	56-001837	38	Prehistoric	Site	Area I	Open air lithic scatter.	Not evaluated
CA-VEN-1838	56-001838	39	Prehistoric	Site	Area II	Rockshelter with shell.	Not evaluated
CA-VEN-1839/H	56-001839	40	Historic	Site	Area I (Liquid Oxygen Plant)	Open air site with Modern graffiti ("D+D" within a heart).	Not evaluated
CA-VEN-1840	56-001840	41	Prehistoric	Site	Area II	Rockshelter with asphaltum-coated basketry, shell, groundstone, lithics.	Not evaluated
-	Pending	2014SSFL6.10.1	Prehistoric	Isolate	Area II	Fused shale biface thinning flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	Pending	2014SSFL6.10.2	Prehistoric	Isolate	Area II	Quartzite core fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	Pending	2014SSFL6.11.1	Prehistoric	Isolate	Area II	Quartzite core fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	Pending	2014SSFL6.24.1	Prehistoric	Isolate	Area II	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	Pending	2014SSFL6.25.1	Prehistoric	Isolate	Area II	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	Pending	2014SSFL6.30.1	Prehistoric	Isolate	Area II	Edge-modified quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
-	Pending	2014SSFL7.15.1	Prehistoric	Isolate	Area I (Liquid Oxygen Plant)	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	Pending	2014SSFL7.15.2	Prehistoric	Isolate	Area I (Liquid Oxygen Plant)	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	Pending	2014SSFL7.16.1	Prehistoric	Isolate	Area I (Liquid Oxygen Plant)	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	Pending	2014SSFL7.17.1	Prehistoric	Isolate	Area II	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	Pending	2014SSFL7.21.1	Prehistoric	Isolate	Area II	Edge-modified quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	Pending	2014SSFL7.22.1	Prehistoric	Isolate	Area II	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	Pending	2014SSFL7.22.2	Prehistoric	Isolate	Area II	Quartzite core fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	Pending	2014SSFL7.24.1	Prehistoric	Isolate	Area I (Liquid Oxygen Plant)	Quartzite core fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	Pending	2014SSFL7.25.1	Prehistoric	Isolate	Area II	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	Pending	2014SSFL7.25.2	Prehistoric	Isolate	Area II	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	Pending	2014SSFL7.29.1	Prehistoric	Isolate	Area II	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-001411Update	2013SSFL12.3.2	Prehistoric	Isolate	Area III	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-001458Update	2013SSFL10.30.2	Prehistoric	Isolate	Area I (Boeing)	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
-	56-001467Update	2013SSFL10.31.7	Prehistoric	Isolate	Area I (Boeing)	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-001495Update	2013SSFL10.8.4	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite core fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100139	SSFL-ISO-1	Prehistoric	Isolate	Area IV	Abalone shell fragment located in rockshelter.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100151	SSFL-ISO-2	Prehistoric	Isolate	Area IV	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100258	2010SSFL7.22.1	Prehistoric	Isolate	Area IV	Quartzite hammerstone.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100282	2010SSFL7.27.1	Prehistoric	Isolate	Area IV	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100283	2010SSFL7.28.1	Prehistoric	Isolate	Area IV	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100284	2010SSFL9.16.1	Prehistoric	Isolate	Area IV	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100285	2010SSFL11.10.1	Prehistoric	Isolate	Area IV	Metavolcanic core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100286	2010SSFL12.7.1	Prehistoric	Isolate	Area IV	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100287	2010SSFL12.7.2	Prehistoric	Isolate	Area IV	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100288	2011SSFL1.10.1	Prehistoric	Isolate	Area IV	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100289	2011SSFL2.17.1	Prehistoric	Isolate	Area IV	Steatite arrow shaft straightener.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
-	56-100290	2011SSFL3.24.1	Prehistoric	Isolate	Area IV	Fused shale debitage.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100291	2011SSFL6.17.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100292	2011SSFL6.27.1	Prehistoric	Isolate	Area IV	Quartzite scraper plane.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100293	2011SSFL7.8.2	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100294	2011SSFL8.22.1	Prehistoric	Isolate	Area IV	Quartzite core fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100295	2011SSFL8.30.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite core fragments and flakes.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100296	2011SSFL8.31.1	Prehistoric	Isolate	Northern Undeveloped Area	Chert scraper.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100297	2011SSFL9.9.3	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100298	2011SSFL9.12.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100299	2011SSFL9.16.1	Prehistoric	Isolate	Northern Undeveloped Area	Pismo clam fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100300	2011SSFL9.27.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100301	2011SSFL10.3.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100302	2011SSFL10.5.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
-	56-100303	2011SSFL10.7.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite core fragments.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100304	2011SSFL10.12.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100305	2011SSFL10.12.2	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100306	2011SSFL10.14.2	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100307	2011SSFL10.17.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100308	2011SSFL10.20.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100309	2011SSFL10.24.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100310	2011SSFL10.25.1	Prehistoric	Isolate	Area IV	Chert flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100311	2011SSFL10.26.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100312	2011SSFL10.26.2	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100313	2011SSFL10.26.4	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100314	2011SSFL10.26.5	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100315	2011SSFL10.26.6	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
-	56-100316	2011SSFL10.28.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite core fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100317	2011SSFL10.28.1	Prehistoric	Isolate	Area IV	Obsidian debitage.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100318	2011SSFL11.2.1	Prehistoric	Isolate	Northern Undeveloped Area	Bifacial mano.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100319	2011SSFL11.2.2	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100320	2011SSFL11.10.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite scraper plane.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100321	2011SSFL12.5.1	Prehistoric	Isolate	Area IV	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100322	2012SSFL3.20.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite scraper plane.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100323	2012SSFL3.30.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100324	2012SSFL4.4.1	Prehistoric	Isolate	Northern Undeveloped Area	Fused shale projectile point.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100325	2012SSFL4.4.2	Prehistoric	Isolate	Northern Undeveloped Area	Fused shale flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100326	2012SSFL4.10.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100327	2012SSFL5.16.1	Prehistoric	Isolate	Northern Undeveloped Area	Fused shale fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
-	56-100328	2012SSFL9.14.1	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100329	2013SSFL10.3.1	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100330	2013SSFL10.6.1	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100331	2013SSFL10.7.1	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100332	2013SSFL10.8.1	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite core fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100333	2013SSFL10.8.2	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100334	2013SSFL10.8.3	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite core fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100335	2013SSFL10.9.1	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite core fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100336	2013SSFL10.10.1	Prehistoric	Isolate	Southern Undeveloped Area	Chalcedony flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100337	2013SSFL10.15.1	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100338	2013SSFL10.16.1	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100339	2013SSFL10.16.2	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
-	56-100340	2013SSFL10.16.3	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite core fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100341	2013SSFL10.18.1	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100342	2013SSFL10.18.2	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100343	2013SSFL10.18.3	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100344	2013SSFL10.18.4	Prehistoric	Isolate	Area I (Boeing)	Quartzite core tool.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100345	2013SSFL10.21.1	Prehistoric	Isolate	Area I (Boeing)	Quartzite cobble with battering and use-wear.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100346	2013SSFL10.21.2	Prehistoric	Isolate	Area I (Boeing)	Metavolcanic cobble with use-wear on one face.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100347	2013SSFL10.22.1	Prehistoric	Isolate	Southern Undeveloped Area	Metavolcanic core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100348	2013SSFL10.22.2	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100349	2013SSFL10.22.3	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100350	2013SSFL10.22.4	Prehistoric	Isolate	Southern Undeveloped Area	Quartz flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100351	2013SSFL10.22.5	Prehistoric	Isolate	Area I (Boeing)	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
-	56-100352	2013SSFL10.22.6	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100353	2013SSFL10.22.7	Prehistoric	Isolate	Area I (Boeing)	Chalcedony flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100354	2013SSFL10.23.1	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100355	2013SSFL10.23.2	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100356	2013SSFL10.23.3	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100357	2013SSFL10.24.1	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100358	2013SSFL10.24.2	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100359	2013SSFL10.24.3	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite core fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100360	2013SSFL10.28.1	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100361	2013SSFL10.28.2	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100362	2013SSFL10.28.3	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100363	2013SSFL10.30.1	Prehistoric	Isolate	Area I (Boeing)	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
-	56-100364	2013SSFL10.31.1	Prehistoric	Isolate	Area I (Boeing)	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100365	2013SSFL10.31.2	Prehistoric	Isolate	Area I (Boeing)	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100366	2013SSFL10.31.3	Prehistoric	Isolate	Area I (Boeing)	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100367	2013SSFL10.31.4	Prehistoric	Isolate	Area I (Boeing)	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100368	2013SSFL10.31.5	Prehistoric	Isolate	Area I (Boeing)	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100369	2013SSFL10.31.6	Prehistoric	Isolate	Area I (Boeing)	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100370	2013SSFL11.4.1	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite tested cobble.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100371	2013SSFL11.8.1	Prehistoric	Isolate	Area III	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100372	2013SSFL11.8.2	Prehistoric	Isolate	Area III	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100373	2013SSFL11.13.1	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100374	2013SSFL11.14.1	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100375	2013SSFL11.14.2	Prehistoric	Isolate	Area III	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
-	56-100376	2013SSFL11.14.3	Prehistoric	Isolate	Area III	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100377	2013SSFL11.18.1	Prehistoric	Isolate	Area III	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100378	2013SSFL11.18.2	Prehistoric	Isolate	Area III	Quartzite shatter.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100379	2013SSFL11.19.1	Prehistoric	Isolate	Area I (Boeing)	Black fused shale flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100380	2013SSFL11.19.2	Prehistoric	Isolate	Area I (Boeing)	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100381	2013SSFL11.20.1	Prehistoric	Isolate	Area I (Boeing)	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100382	2013SSFL11.22.2	Prehistoric	Isolate	Area I (Boeing)	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100383	2013SSFL11.26.1	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite core fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100384	2013SSFL11.26.2	Prehistoric	Isolate	Southern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100385	2013SSFL12.3.1	Prehistoric	Isolate	Area III	Quartzite core.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100386	2013SSFL12.3.3	Prehistoric	Isolate	Area III	Quartzite core fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100387	2013SSFL12.5.1	Prehistoric	Isolate	Southern Undeveloped Area	Sandstone pestle.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA

Trinomial	Primary Number	Temporary Number	Date	Site or Isolate	Location	Description	Significance
-	56-100471	2433-1 Iso	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite shatter.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100472	2433-3 Iso	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100473	2433-5 Iso	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite cobble.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100474	2433-7 Iso	Prehistoric	Isolate	Northern Undeveloped Area	Quartzite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	56-100475	2433-10 Iso	Prehistoric	Isolate	Northern Undeveloped Area	Mano fragment.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA
-	-	2010SSFL12.10.1	Prehistoric	Isolate	Area IV	Andesite or rhyolite flake.	Not eligible for NRHP or CRHR; not a historical or unique archaeological resource under CEQA

*Part of the Burro Flats Site Complex

Simi Hills Archaeological District

To date, 144 archaeological sites have been identified within the project site, of which 138 are either prehistoric in age or are multicomponent sites. While many archaeological studies documenting individual archaeological sites have been performed over the past 50 years within the project site, the interrelationship between these sites has never been examined. Therefore, a study (Bray et al., 2016) has been prepared: (1) to determine whether an archaeological district exists within the project site; (2) if so, to define the boundaries and contributing elements of the district; and (3) to determine whether the district is eligible for listing in the NRHP or CRHR.

According to *National Register Bulletin 36,* an archaeological district exists where there are historically or functionally related archaeological properties that are united by their cultural affiliation, related elements of a pattern of land use, or historical development (Little et al., 2000). To ascertain whether this scenario exists within the project site, the district study examined the following variables: (1) site distribution, (2) the spatial patterning of sites based on a combination of assigned site types and site attributes, and (3) the relationship between sites and natural resources and topography. This study includes the 138 prehistoric and multicomponent archaeological sites that have been recorded to date within the project site (Bray et al., 2016).

Based on data collected in pedestrian archaeological surveys of the project site, site locations were mapped using a geographic information system (GIS). Archaeological sites were assigned one or more site attributes (rock art, midden, artifact scatter, lithic scatter, faunal remains, and groundstone) based on surface evidence. Then, based on attributes and inferred site function, each site was classified as belonging to one of six site types, including: habitation, habitation/religious/ceremonial, religious/ceremonial, temporary camp, tool manufacturing, and trail. Environmental variables were also included in the GIS, including oak habitat, location of watercourses, landform elevation, landform slope, landform aspect, and geology. Based on these data sets, spatial patterning of the sites in relation to each other and to natural features was examined.

To be eligible for listing in the NRHP or CRHR, archaeological sites, must possess linkage or connection that when taken together as a district, address relevant regional research questions/themes. The results of the study revealed several aspects of spatial patterning that contribute to an understanding of four regional research themes: prehistoric settlement patterns, prehistoric subsistence, prehistoric lithic technology, and prehistoric rock art (Bray et al., 2016).

The spatial distribution of archaeological sites suggests three general patterns of prehistoric settlement. First, sites tend to be located in proximity to water sources, with habitation sites located nearer to water than limited-activity sites, such as temporary camps. This pattern is consistent with prehistoric settlement trends throughout southern California, where sources of water can be scarce and access to water strongly influenced settlement location (Meyer et al., 2010). Second, sites tend to be located within a limited range of elevation, between 1,600 and 1,800 feet AMSL. The reasons for this preference are unknown; however, it is possible that this elevation range corresponds with the location of water or the habitat of some types of natural resources of interest to site occupants. Third, sites are clustered into a core habitation area in the

vicinity of Bell Creek and the Burro Flats Site Complex that could represent an area of permanent or seasonally reoccupied settlement, possibly centered on ceremonial activities, while a number of limited-activity sites, such as temporary camps and tool manufacturing sites, are more widely dispersed.

In terms of prehistoric subsistence, the presence and spatial distribution of bedrock mortars in close proximity to oak habitat indicates that the project site appears to have been an important place for the procurement and processing of acorns. Based on the presence of manos, projectile points, and hunting blinds, it is likely that seed-gathering and processing and hunting were also common subsistence activities.

The distribution of lithic artifacts across the project site provides insight into prehistoric lithic technology. Based on the type of lithic materials found within the project site, it is clear that prehistoric inhabitants were heavily exploiting locally available quartzite to manufacture expedient tools, while reserving higher-quality and more exotic materials for formal tools such as projectile points.

Finally, mapping the location of rock art relative to other sites within the project site has shown that rock art was frequently located in association with habitation and bedrock milling sites in places where people would have come together in order to gather and process resources. Sites containing rock art also tend to be located in the core habitation area, in proximity to Bell Creek and the Burro Flats Site Complex.

The study resulted in the conclusion that the archaeological resources within the project site are indeed connected through cultural affiliation and patterns of land use, and do in fact constitute an archaeological district (Bray et al., 2016). The district, referred to here as the Simi Hills Archaeological District (District), has the potential to provide important information on the lifeways of the people who inhabited the Simi Hills during the prehistoric era, and is eligible for listing in the NRHP and CRHR. The District consists of prehistoric and multicomponent archaeological sites that are related by shared Native American cultural affiliation, as well as patterns of land use. The District is significant on a local level: for its association with the broad patterns of prehistoric settlement and subsistence in the Simi Hills and Santa Monica Mountains (NRHP Criterion A/CRHR Criterion 1); as a significant and distinguishable entity whose components may lack individual distinction, as well as for the rock art found within the District that embodies distinctive characteristics of a style and possesses high artistic value (Criterion C/3); and for its potential to contribute information to important regional research themes, such as regional and local prehistoric settlement patterns; prehistoric subsistence; prehistoric lithic technology; and prehistoric rock art (Criterion D/4). The District consists of individual archaeological sites that, when taken together, are historically significant. The various site types identified represent a full suite of site types associated with prehistoric hunter-gatherer activities and reflect a correspondingly broad range of human behavior across the landscape.

The period of significance for the District consists of the documented period of Native American habitation in the Simi Hills, which ranges from approximately 7000 B.C. to the early 19th century. Because so few of the archaeological sites within the District have been subject to subsurface

investigation or contain datable materials in their surface component, the precise dates of occupation associated with the District are unknown. As more sites are subject to additional investigation, it is expected that the District's period of significance may be refined.

The boundary of the District, as currently defined, arbitrarily includes the 2,850-acre project site and offsite impact areas. The District almost certainly extends beyond this; however, at present only archaeological sites within the project site have been evaluated and the boundary is based on available information. Future research may further expand or refine the District boundary.

According to *National Register Bulletin 36*, to be considered a contributor to the eligibility of an archaeological district, a resource must add to the associations or values for which a district is significant; must have been present during the district's period of significance; must relate to the documented significance of the district; and must possess historical integrity or be capable of yielding important information relative to the district's significance (Little et al., 2000). In the context of the Simi Hills Archaeological District, a resource must be able to contribute, or have the potential to contribute, information to the understanding of local patterns of prehistoric settlement and subsistence, prehistoric lithic technology, and prehistoric rock art in the Simi Hills, in particular through the presence of archaeological data and to the resource's spatial relationships to other resources and to the environment. Contributors must therefore: (1) constitute an archaeological site; (2) date to the District's period of significance (7000 B.C. to early 19th century) and be associated with Native American use of the project site; (3) retain integrity of location; and (4) contain sufficient data to be associated with one of the established District site types, or with an as-yet-unestablished District site type.

All of the 132 prehistoric sites and the prehistoric components of the six multicomponent archaeological sites identified to date within the project site are contributors to the significance of the District. The prehistoric sites and the prehistoric components of the multicomponent sites represent a variety of site types that reflect prehistoric human settlement and subsistence activities associated with habitation of the Simi Hills. The six historic-period sites, the historic-period components of the multicomponent sites, and the 136 isolated artifacts (which lack important contextual information due to their isolated nature) are not considered contributors because they do not meet the above criteria.

The integrity of the District as a whole is good, with most identified sites in fair to excellent condition. The District retains integrity of location, design, setting, materials, workmanship, feeling, and association. Integrity of setting and feeling have been slightly affected by the grading of roads and pads and the construction of historic-era buildings and infrastructure related to SSFL; however, such intrusions are localized and do not compromise the ability of the District to convey its historical significance. The sites within the District retain archaeological integrity as well, meaning that the data contained within the sites is well preserved.

The District study resulted in some preliminary conclusions regarding prehistoric settlement patterns, prehistoric subsistence, prehistoric lithic technology, and prehistoric rock art, and has preliminarily defined an archaeological district within the project site. However, the study was based on the data that has resulted primarily from pedestrian surface studies, and conclusions

should be considered preliminary and subject to change as more data comes to light as a result of future project-related archaeological studies. The District retains a great deal of data potential, and future archaeological research resulting from mitigation for impacts of the proposed project could contribute substantial data, which could in turn address additional research topics. Future research topics that could be explored in further defining the District include site chronology and shifts in settlement patterns over time, the seasonality of occupation within the project site, and ethnic boundaries and cross-cultural interaction.

SSFL Traditional Cultural Property and Sacred Site

The project site is located within, and is encompassed by, a TCP (SSFL TCP) of traditional religious and cultural significance to several local tribes including the Chumash, Tataviam, and Gabrielino Tongva. The TCP was identified by NASA within the federally owned NASA-administered Area II and Area I (Liquid Oxygen Plant). A Traditional Cultural Properties and Cultural Landscape Review (Lawson, 2013) was prepared for NASA which identified a TCP associated with the Burro Flats Site Complex (formerly CA-VEN-1072). NASA expanded the TCP boundary to include those areas corresponding to the boundaries of the NASA-administered areas (NASA, 2014). NASA did not identify the contributing elements of the SSFL TCP.

NASA determined that the TCP was eligible for inclusion in the NRHP under Criteria A and D (NASA, 2014). Because the TCP has been determined eligible for inclusion in the NRHP, it is automatically listed in the CRHR (PRC Section 5024.1(d)(1)) and is considered a tribal cultural resource as defined by PRC Section 21074(a).

Physical characteristics ("contributing elements") of the SSFL TCP that appear to convey its historical significance appear to include prehistoric and multicomponent archaeological sites and isolates, prehistoric rock art, topographic features (including mountain peaks and rock outcroppings), plants (particularly indigenous plants of traditional cultural significance), and animals (Armenta, 2013; Armenta, 2014; NAHC, 2013).

Inventories of native plant and animal species have indicated that there are a large number of plant species located within the project site that were traditionally important to Native American communities. In 2011, as a result of NASA's consultation with the Santa Ynez Band of Chumash Indians, six plants and five animals within the NASA portion of the project site were identified as having known cultural use by the Santa Ynez Band of Chumash Indians (CH2M Hill, 2014). NASA conducted additional interviews and research and identified 12 plant species (broad leaved milkweed [*Asclepias eriocarpa*], narrow-leaved milkweed [*Asclepias fascicularis*], common fiddleneck [*Amsinckia menziesii*], wild cucumber or Manroot [*Marah macrocarpu*s], coast live oak [*Quercus agrifolia*], chia sage [*Salvia columbariae*], yucca [*Yucca whipplei*], brodaeia [*Dichelostemma pulchellum*], mustard [*Guiliana lasiophylla*], elegant clarkia [*Clarkia unguiculata*], soaproot [*Chlorogalum pomeridianum*], and white snapdragon [*Antirrhinum coulterianu*]) and six animal species (coast horned lizard [*Phrynosoma blainvillii, Anota coronatum*], acorn woodpecker [*Melanderpes formicivorus*], American crow [*Corvus brachyrhynchos*], common raven [*Corvus corax*], greater roadrunner [*Geococcyzus californianus*], and deer) with traditional use within the Area I (NASA) and Area II portion of the

project site were identified (Lawson, 2013: Table 6.1-1). Finally, in 2014, Leidos compiled a list of plant species with known ethnographic uses that occur in Area IV (Bryne, 2014: Appendix A). This list, which included 81 plants, was based on a review of published ethnographic literature, but did not include interviews with Native American representatives.

Because the Simi Hills Archaeological District is a prehistoric archaeological resource that includes the individual prehistoric and multicomponent sites already identified as contributors to the TCP, the District should be considered a contributing element to the TCP.

The Santa Ynez Band of Chumash Indians (Santa Ynez Band) has nominated the federally owned portions of the project site a sacred site under Executive Order 13007. Executive Order 13007 requires that in managing federal lands, federal agencies must accommodate access to and ceremonial use of Indian sacred sites and avoid adversely affecting the physical integrity of sacred sites. While DOE does not own property at Area IV, DOE is continuing to consult with the Native American tribes with ties to the project area to manage the cultural resources and the sacred nature of Area IV.

The Santa Ynez Band of Chumash Indians has also registered the entire project site as a sacred site with the Native American Heritage Commission (NAHC), called the "Santa Susana Sacred Sites and Traditional Cultural Landscape" (NAHC, 2013). The nomination states, in part:

> *All of those who have had the opportunity to visit agree that the Burro Flats Painted Cave and the surrounding Santa Susana Field Laboratory (where numerous Native American sites are now known to exist) are part of a large and important Traditional Cultural Landscape. Today, many indigenous people consider the Burro Flats Painted Cave to be a very important shrine site, and feel strongly that it and the surrounding area are important to their culture. It is for this reason that the Elder's Council of the Santa Ynez Band of Chumash Indians has requested that the entire former Santa Susana Field Lab be described as the Santa Susana Sacred Sites and Traditional Cultural Property, by the State of California.*

Built Environment Resources

The following three main studies addressing built environment resources have been conducted: (1) Archaeological Consultants, Inc. (ACI) and Weitze Research conducted a historic resources assessment survey of NASA-owned built environment resources in Areas I and II in 2007/2008 (ACI and Weitze, 2009); (2) Post/Hazeltine Associates completed a historic structures/sites report for Area IV in 2009 (Post/Hazeltine Associates, 2009); and (3) Post/Hazeltine Associates conducted a historic resources survey and assessment of selected resources in Area I, Area III, and Area IV in 2009 (Post/Hazeltine Associates, 2010). The following section summarizes the results of these studies and provides a discussion of the remaining built environment resources at the project site organized by area. This section also includes a discussion of remaining utility infrastructure systems that may be encountered during ground disturbance related to remediation activities.

Area I (NASA) and Area II

ACI and Weitze Research completed a survey and evaluation of NASA-owned built environment resources within Area I and Area II in 2009. The results of the study identified three NRHP-eligible historic districts: Alfa Test Area, Bravo Test Area, and Coca Test Area. The Alfa Test Area Historic District contains 10 contributing resources and five noncontributing resources; the Bravo Test Area Historic District contains eight contributing resources and one noncontributing; and the Coca Test Area Historic District contains 18 contributing resources and four noncontributing resources (Table 4.4-2). Nine of the contributing resources are also individually eligible (see Table 4.4-2). State Historic Preservation Officer (SHPO) concurred with the eligibility finding on May 15, 2008 (NASA, 2014).

As discussed in Section 3.7.3.3, *NASA Test Stands and Buildings*, of this PEIR, demolition of historic-period built environment resources in NASA's area of responsibility is not subject to DTSC approval and is therefore not evaluated or described in this PEIR as part of the proposed project. Therefore, the Alfa Test Area, Bravo Test Area, and Coca Test Area Historic Districts are summarized briefly in **Table 4.4-2**; this issue is not addressed further in the analysis of program- or project-specific impacts, but is addressed in the cumulative section.

TABLE 4.4-2
HISTORIC DISTRICTS WITHIN THE NASA PORTION OF THE PROJECT SITE

Facility No.	Name	Date	NRHP Status	Current Condition
Alfa Test Area Historic District				
2727	Alfa I Test Stand	1954	Individually eligible/Contributor to district	Extant
2729	Alfa III Test Stand	1954	Individually eligible/Contributor to district	Extant
2208	Alfa Control House	1954	Individually eligible/Contributor to district	Extant
2208A	Alfa CC Engineering Trailer	1987	Not individually eligible/Non-contributor	Extant
2209	Alfa Terminal House	1954	Not individually eligible/Contributor to district	Extant
2209A	Alfa II Electrical Control Station	1954	Not individually eligible/Non-contributor	Extant
2212	Alfa Pre-Test Building	1954	Not individually eligible/Non-contributor	Extant
2212B	Alfa Old Guard Shack	1997	Not individually eligible/Non-contributor	Extant
2212S	Alfa Pre-Test Extension	1991	Not individually eligible/Non-contributor	Extant
2727A	Alfa I Electrical Control Station	1954	Not individually eligible/Contributor to district	Extant
2729A	Alfa III Electrical Control Station	1954	Not individually eligible/Contributor to district	Extant
2739	Standtalker Shack	Mid-1960s	Not individually eligible/Contributor to district	Extant
2X	Alfa Pill Box	1955	Not individually eligible/Contributor to district	Extant
2Y	Alfa Pill Box	1955	Not individually eligible/Contributor to district	Extant
-	Landscape/Spillway	-	Not individually eligible/Contributor to district	Extant
Bravo Test Area Historic District				
2730	Bravo Test Stand	1955	Individually eligible/Contributor to district	Extant
2731	Bravo II Test Stand	1955	Individually eligible/Contributor to district	Extant
2213	Bravo Control House	1955	Individually eligible/Contributor to district	Extant
2214	Bravo Terminal House	1955	Not individually eligible/Contributor to district	Extant

Facility No.	Name	Date	NRHP Status	Current Condition
2730A	Bravo I Electrical Control Station	1955	Not individually eligible/Contributor to district	Extant
2731A	Bravo II Electrical Control Station	1955	Not individually eligible/Contributor to district	Extant
2732A (now 2732)	Bravo III Electrical Control Station (now "Bravo Storage")	1955	Not individually eligible/Non-contributor	Extant
2Z	Bravo Pill Box	1955	Not individually eligible/Contributor to district	Extant
-	Landscape/Spillway		Not individually eligible/Contributor to district	Extant
Coca Test Area Historic District				
2733	Coca I Test Stand	1962/1963	Individually eligible/Contributor to district	Extant
2787	Coca IV Test Stand	1962/1963	Individually eligible/Contributor to district	Extant
2218	Coca Control House (now Coca Control Center)	1955	Individually eligible/Contributor to district	Extant
2219	Coca Terminal House	1955	Not individually eligible/Non-contributor	Extant
2222	Pre-Test Building	1955	Not individually eligible/Contributor to district	Extant
2235	Electrical Control Station (Liquid Oxygen Plant)	1964	Not individually eligible/Contributor to district	Extant
2236	Electrical Control Station (LH2)	1964	Not individually eligible/Contributor to district	Extant
2237	GH2 Compressor Building – Control Center	1964	Not individually eligible/Contributor to district	Extant
2239	GH2 Compressor Building (now Compressor Building – Main Building)	1966	Not individually eligible/Contributor to district	Extant
2240	Hydraulic Supply Building	1972	Not individually eligible/Non-contributor	Extant
2241	Pump House	1973	Not individually eligible/Contributor to district	Extant
2451	Roof Shelter	1967	Not individually eligible/Non-contributor	Extant
2520	High Pressure GH2 and GN2 Vault	1972	Not individually eligible/Contributor to district	Extant
2614	Observation Bunker (now Coca IV Pillbox)	1962	Not individually eligible/Contributor to district	Extant
2734	Coca II Test Stand	1955	Not individually eligible/Non-contributor	Demolished
2A	North Observation Bunker	1964	Not individually eligible/Contributor to district	Extant
2B	Pill Box (now Observation Bunker)	1955	Not individually eligible/Contributor to district	Extant
V100	LH2 Vessel #1	1964	Not individually eligible/Contributor to district	Extant
V180	Liquid Oxygen Plant Vessel #1	1963	Not individually eligible/Contributor to district	Extant
V99	GH2 Vessel	1964	Not individually eligible/Contributor to district	Extant
-	Cable Tunnel	1963	Not individually eligible/Contributor to district	Unknown
-	Landscape/Spillway	1964	Not individually eligible/Contributor to district	Extant

Source: ACI and Weitze Research, 2009.

DOE Area IV and Northern Undeveloped Area

Post/Hazeltine Associates completed an evaluation of DOE-owned built environment resources within Area IV in 2009; the study determined that Area IV is associated with two important historic events: (1) post-WWII nuclear power research and development in California and the United States; and (2) post-WWII development of southern California. However, the study concluded that Area IV lacks sufficient integrity to convey its historical association with these events and was not eligible for listing in the NRHP or CRHR as a historic district. In addition, none of the built environment resources were found individually eligible for listing in the NRHP or CRHR (Post/Hazeltine Associates, 2009). The SHPO concurred with these findings in 2010 (OHP, 2010).

At the time of the 2009 study, approximately 75 percent of the built environment resources in Area IV had already been demolished. At present, there are 18 remaining built environment resources in Area IV (**Table 4.4-3**).

TABLE 4.4-3
REMAINING BUILT ENVIRONMENT RESOURCES IN AREA IV

Facility No.	Name	Date	NRHP/CRHR Status
Radioactive Materials Handling Facility (RMHF)			
B4021	Waste Decontamination and Packaging	1959	Not eligible
B4022	Radioactive Vault Storage	1959	Not eligible
B4034	Office Building	1961	Not eligible
B4044	Clean Shop	Mid-1960s	Not eligible
B4075	Contaminated Equipment Storage Building	1971	Not eligible
B4563	Covered Storage Yard	1958	Not eligible
B4621	Equipment Storage	Mid-1960s	Not eligible
B4658	Guard Shack	Early 1980s	Not eligible
B4665	Oxidation Facility	Mid-1960s	Not eligible
B4688	Auxiliary Skid Shack	ca. 1962	Not eligible
Systems for Nuclear Auxiliary Power (SNAP)			
B4019	SNAP Program Critical Acceptance Test Building	1962	Not eligible
B4024	Development Test Laboratory	1960	Not eligible
B4038	SNAP Office Building #2	1962	Not eligible
Sodium Pump Test Facility (SPTF)			
B4057	Launch Handling & Mobile Equipment Development	1961	Not eligible
B4462	SPTF Building	1974	Not eligible
B4463	Sodium Cleaning and Handling Facility	1974	Not eligible
Hazardous Waste Management Facility (HWMF)			
B4029	Radioactive Measurement Facility	1959	Not eligible
B4133	Hazardous Waste Management Facility (HWMF)	ca. mid-1950s to 1964	Not eligible

Source: Post/Hazeltine Associates, 2009.

All of the 18 remaining built environment resources were included in the 2009 study and have been determined not eligible for listing in the NRHP or CRHR. No built environment resources are located within the Northern Undeveloped Area (Post/Hazeltine Associates, 2009).

Radioactive Materials Handling Facility

Construction of the Radioactive Materials Handling Facility (RMHF) began in 1959 when the Radioactive Materials Disposal Facility (RMDF) was established for the decontamination, receipt, and shipment of nuclear fuel and radioactive waste material used or generated by nuclear-related research and development in Area IV. RMDF was subsequently renamed the RMHF. The facility was not used for the disposal of radioactive waste, but instead functioned as a decontamination area or temporary storage for radioactive material prior to its shipment offsite for disposal (Post/Hazeltine Associates, 2009). Between 1959 and 1971, 13 buildings/facilities were constructed at RMHF. There are 10 remaining RMHF buildings/facilities (B4021, B4022, B4034, B4044, B4075, B4563, B4621, B4658, B4665, and B4688).

Buildings B4021, B4022, B4034, B4044, B4075, B4563, B4621, B4658, B4665, and B4688 were previously evaluated for listing in the NRHP and CRHR under the theme of nuclear power research and development in the United States during the post-WWII period, as well as for their association with the RMHF, and were found not eligible (Post/Hazeltine Associates, 2009).

Systems for Nuclear Auxiliary Power Facilities

The Systems for Nuclear Auxiliary Power (SNAP) originated during the Cold War era when an intense rivalry for superiority in nuclear weapons and space technology developed between the United States and the Soviet Union. The SNAP program began in 1955 when the Atomic Energy Commission (AEC), at the request of the Department of Defense (DOD), agreed to study and develop a small nuclear power system capable of powering a satellite in space. The SNAP program was in operation from 1958 to 1971 (Post/Hazeltine Associates, 2009).

SNAP buildings B4019, B4024, and B4038 were previously evaluated for listing in the NRHP and CRHR under the theme of nuclear power research and development in the United States during the post-WWII period, as well as for their association with the SNAP Program, and were found not eligible (Post/Hazeltine Associates, 2009).

Sodium Pump Test Facility

The Sodium Pump Test Facility (SPTF) was part of Energy Technology Engineering Center (ETEC), which was the successor of the Liquid Metals Engineering Center (LMEC). The SPTF was a liquid metal research program that, in conjunction with other ETEC operations, tested various components of sodium systems for the fast breeder reactor program, including sodium cold traps and steam generators designed by Atomics International, and flow meters and sodium pumps designed by Atomics International and the Japanese. The SPTF was the largest facility of its type in the world at the time of its construction and operation. Sodium-cooled reactors never became a fixture of the American nuclear power industry, with only a handful of prototypes and one commercial reactor ever produced in the United States. The SPTF facility in Area IV closed in 2001 (Post/Hazeltine Associates, 2009).

SPTF Buildings B4057, B4462, and B4463 were previously evaluated for listing in the NRHP and CRHR under the theme of nuclear power research and development in the United States during the post-WWII period, as well as for their association with the SPTF, and were found not eligible (Post/Hazeltine Associates, 2009).

Hazardous Waste Management Facility

There are two remaining buildings in DOE's area of responsibility related to former hazardous waste management (B4029 and B4133). Unlike other facilities at SSFL that were used for research and development, the function of these two buildings was primarily treatment and storage of radioactive materials.

HWMF Buildings B4029 and B4133 were previously evaluated for listing in the NRHP and CRHR under the theme of nuclear power research and development in the United States during the post-WWII period and were found not eligible (Post/Hazeltine Associates, 2009).

Boeing Area I, Area III, and Southern Undeveloped Area

Post/Hazeltine Associates completed an evaluation of Boeing-owned built environment resources within Areas I and III in 2010. The study concluded that none of the evaluated resources in Area I or III were eligible for inclusion in the NRHP or CRHR (Post/Hazeltine Associates, 2010a). Boeing has subsequently completed the demolition and removal of all buildings and other built environment resources in Areas I and III, except for the guard shack and fire station located at the entrance area of Area I, which may be left for future use (DTSC does not have discretionary approval over the guard shack and fire station and they are not analyzed as part of this PEIR).

Post/Hazeltine Associates completed an evaluation of Boeing-owned built environment resources within Area IV in 2009. The study found that Area IV is associated with two important historic events: (1) post-WWII nuclear power research and development in California and the United States; and (2) post–WWII development of southern California. However, the study concluded that Area IV lacks sufficient integrity to convey its historical association with these events and was not eligible for listing in the NRHP or CRHR as a historic district. In addition, none of the built environment resources were found individually eligible for listing in the NRHP or CRHR (Post/Hazeltine Associates, 2009). The SHPO concurred with these findings in 2010 (OHP, 2010).

There are four extant Boeing-owned buildings/facilities that are subject to DTSC approval in Area IV (**Table 4.4-4**). No built environment resources are located within the Southern Undeveloped Area (Post/Hazeltine Associates, 2009). Buildings 4009, 4011, 4055/4155, and 4100 were previously evaluated for listing in the NRHP and CRHR under the theme of nuclear power research and development in the United States during the post-WWII period and were found not eligible (Post/Hazeltine Associates, 2009; 2010).

TABLE 4.4-4
BOEING-OWNED BUILT ENVIRONMENT RESOURCES IN AREA IV

Facility No.	Name	Date	NRHP/CRHR Status
B4009	Organic Moderated Reactor/Sodium Graphite Reactor	1958	Not eligible
B4011	Instrument Calibration Lab	1958	Not eligible
B4055, B4155	Nuclear Materials Development Facility	1967	Not eligible
B4100	Fast Critical Experiment Lab/Advanced Epithermal Thorium Reactor building	1960	Not eligible

Source: Post/Hazeltine Associates, 2010a.

SSFL Utility Infrastructure

In addition to the above-ground built environment resources discussed in the previous section, there is remaining utility infrastructure at the project site, including (1) the sanitary system, (2) the water conveyance system, and (3) the natural gas distribution system.

The original sanitary system was constructed prior to 1961 and included a total of 56 septic tanks and 49 leach fields. In 1961, centralized onsite sewage treatment plants were constructed and the older sanitary system abandoned. Three sewage treatment plants provided treatment for most of the sanitary sewer waste at the site: the Area I Sewage Treatment Plant (STP-1), the Area II STP (STP-2), and the Area III STP (STP-3). STP-3 also treated sanitary sewage from operations within Area IV and Area II beginning in 1987 (Lapus, 2012a).

The water conveyance system at the site has been in use since the late 1940s and includes pipelines, groundwater extraction and treatment systems, pump stations, storage tanks, lined and unlined drainages, and storage ponds and surface impoundments. To meet water supply demands at SSFL, the system used a complex interactive network to convey, store, and recirculate reclaimed water mixed with stormwater runoff, fresh process/domestic water from wells, and water imported from offsite. As operations changed through time, so did the water sources, discharge points, and storage locations (Joshi and Bradford, 2012).

The natural gas distribution system is located primarily in the northeastern and western portions of the site, although the complete extent of the system has not been identified. Most piping is located underground with the exception of some aboveground sections within northwestern Area II and Area IV (Lapus, 2012).

Eligibility

In Area I (NASA) and Area II, these types of general underground infrastructure systems support systems have been excluded from consideration as part of the Alfa Test Area, Bravo Test Area, and Coca Test Area Historic Districts, and have not been found eligible for individual listing because they are either moveable equipment or typically updated and changed out over time.

In Area I (Boeing) and Area III, the majority of the infrastructure systems have been removed or demolished, and any association with significant events or persons (Criteria A/1 and B/2) has

been lost. The infrastructure employed at SSFL was typical of systems of the mid-to-late 20th century and does not embody significance in regard to construction, design, or technology, nor represent the work of a master craftsman (Criterion C/3). Because the types of infrastructure that were employed are documented in the historical record, it does not have the potential to yield information important in history (Criterion D/4). Therefore, SSFL utility infrastructure is not eligible for listing in the NRHP or CRHR.

4.4.1.6 Geoarchaeological Review

A geoarchaeological analysis was conducted for this project to determine which landforms within the project site have the potential for buried archaeological resources (Lockwood, 2016). This analysis included an examination of previous archaeological survey reports, archaeological site forms, historic maps and aerial photos, geological maps, soils surveys, and geotechnical boring logs.

Geomorphic Setting

Because of its elevated topographic position, the project site has not been subject to significant sedimentation by outside natural processes since people first arrived within the region. The dominant geomorphic processes at work are ongoing weathering of local bedrock and movement of weathered sediments by gravity and water. Human modification of the landscape through grading and filling has been variable, but is especially pronounced within the Burro Flats topographic area located in Area IV.

The rock types present within the project site are generally susceptible to formation of rockshelters and overhangs, which are prevalent within the project site. An important first step in rockshelter formation involves chemical weathering of feldspars to clay, which causes the feldspars to expand and pry loose from the rock surface. Loose grains may then be removed by wind, water, and gravity, or may accumulate within the void or as scree or talus below it. In fact, rockshelters represent locations on the landscape with the potential for buried archaeological resources. Many archaeological sites discovered within the project site occur within or in close proximity to Chatsworth Formation sandstone outcrops, which contain small rockshelters and overhangs (Corbett et al., 2012).

Soils

Soil formation occurs when deposited sediments are sufficiently stable to be subject to the effects of soil formation factors, including climate, relief, type of parent material, organisms, and the passage of time. From an archaeological perspective, the factor of greatest interest is usually the passage of time. In the absence of absolute chronological controls, such as radiocarbon dating, the degree of soil development and time elapsed since beginning of soil formation is usually classified into relative age categories, such as *young*, *intermediate*, and *old*.

Soils across the project site tend to be thin and rocky (NRCS, 2015). The dominant mapped soil type is Sedimentary Rock Land (*SnG*). This soil type forms on 30 to 75 percent slopes within residuum parent material weathered from sedimentary bedrock. This soil type is typically quite

shallow with only 8 to 20 inches to lithic bedrock, which is due in part to the tendency for unconsolidated sediments to be eroded from steep slopes by wind, water, and gravity.

Similarly, Gaviota rocky sandy loam (*GrF*), which is commonly found next to Sedimentary Rock Land, forms on 15 to 50 percent slopes within residuum parent material weathered from sandstone, and typical depth of only 8 to 20 inches to bedrock. The typical Gaviota soil consists of a topmost soil A-horizon directly overlying regolith (bedrock), and effectively precludes a potential for deep burial of archaeological resources. In light of the significant slopes, tendency for erosion, and lack of soil accumulation on slopes, Sedimentary Rock Land and Gaviota rocky sandy loam are generally considered to have very low potential to contain intact buried archaeological resources. An important exception is within rockshelters, on flat areas near the openings of rockshelters, and at the base of slopes beneath rockshelters. Sedimentary Rock Land and Gaviota rocky sandy loam comprise all of Area I, most of Area II, the Northern Undeveloped Area and the Southern Undeveloped Area, and the northern margin of Area IV.

A small area of Gullied Land (*GxG*) is mapped in the southern part of Area I. Gully formation results from long-term erosion by water. Soils within Gullied Lands develop within bedrock residuum, but otherwise vary in their typical profile.

Portions of Areas II, III, IV, and the Northern Undeveloped Area are mapped as Saugus sandy loam (*ShE*). This soil type occurs on 5 to 30 percent slopes and develops within residuum weathered from sandstone and shale. The unconsolidated parent material of Saugus appears to be an accumulation of material eroded from cliffs (colluvium) and transported by runoff (alluvium), particularly along canyon bottoms. Compared with Sedimentary Rock Land and Gaviota rocky sandy loam, Saugus sandy loam is found on gentler slopes, which are less susceptible to erosion and have a greater typical depth to bedrock at approximately 40 to 60 inches.

There is a higher potential for intact, buried archaeological resources in Saugus soils, but the depth and extent of actual coverage may be limited. The Burro Flats Site Complex is located within an area mapped largely as Saugus sandy loam. The Burro Flats Site Complex contains deep midden and cultural material, some of which has been partially buried by silt washing down from higher elevations.

An important, if spatially restricted, soil type is Zamora loam (*ZmC* and *ZmD2*), which is mapped within the Burro Flats area of Area III and IV. Zamora loam is found on alluvial fans and benches with 2 to 9 percent slopes and on adjacent 9 to 15 percent slopes. Zamora loam is characterized as a deep soil developed within alluvium derived from bedrock. Depth to restrictive bedrock in this fine-grained soil type typically is more than 80 inches. The soil profile may indicate landscape stability and soil formation on the order of thousands to tens of thousands of years. In floodplain settings elsewhere California, Zamora soils have been found to be as young as 2,000 to 3,000 years old (Meyer and Rosenthal, 2008). However, based upon the elevated setting of the project site, natural deposition of substantial amounts of Zamora parent material in the Burro Flats area within the last few several thousand years seems unlikely. Zamora soils have similar sensitivity for archaeological resources as Saugus soils.

The western boundary of the Southern Undeveloped Area contains areas mapped as Linne clay loam (*LeE2*), Badland (*BgD*) and Calleguas-Arnold Complex (*CbF2*). Linne soils occur on slopes of 15 to 30 percent and typically contain an A-horizon directly overlying parent material consisting of bedrock weathering in situ. Badland and Calleguas-Arnold soils occur along slopes of more than 30 percent, and, similar to soils in other steeply sloped areas, these soils types imply there is, at most, a thin drape of unconsolidated sediments overlying near surface bedrock in most areas. Localized sedimentary accumulation and soil formation could occur in discrete, low-lying areas, such as the toes of slopes and hollows in bedrock.

Geotechnical

Depth to bedrock across the project site was interpolated using existing data from 11,020 previous boring locations. The interpolation suggests that depth to bedrock is 2 feet or less for the majority of Area I, Area II, Area III, the Northern Undeveloped Area, and the Southern Undeveloped Area. However, Area I does contain several large areas where depth to bedrock is up to 5 feet. Depth to bedrock is variable and generally deeper in Area IV, due in large part to placed fill.

Bryne (2014) conducted archaeological survey, site verification, and monitoring during Phase 3 soil chemical sampling in Area IV, the Northern Undeveloped Area, and adjacent lands. No buried archaeological sites were observed during subsurface work. Near-surface soil within the area consists of alluvium (weathered Chatsworth Formation bedrock), colluvium (displaced from upslope), and placed fill soil. Alluvium and colluvium exists in topographic lows and drainages, with thickness ranging between less than 1 foot and up to 20 feet. Fill materials are common, having been used at building locations and as backfill following soil removals (CH2M Hill, 2008). The test pits and trenches revealed high variability in fill thickness across the Burro Flats area, ranging between 0 and 11 feet, consistent with the interpolated depth to bedrock results. Native soils, consisting primarily of sand overlying restrictive bedrock, were encountered in all geotechnical holes reported by Bryne (2014), and thickness of native soils ranged between 0.75 feet and 12.5 feet.

Geoarchaeological Conclusions

The likelihood of intact buried archaeological resources within a particular landform depends upon several factors. These factors include, but are not necessarily limited to: the original presence or absence of archaeological resources, the tendency for sediments to be deposited or to erode, and the timing and magnitude of natural (and human-induced) deposition and erosion in relation to the original deposition of archaeological resources. Areas in which past human activity did not occur, or occurred but did not leave observable traces, necessarily lack potential for archaeological resources. Artifacts left by people on erosional landforms, such as steep slopes, are unlikely to be buried deeply (if at all), and instead may be susceptible to erosion. On the other hand, depositional landforms, such as alluvial fans and terraces, tend to receive sediments that may bury archaeological resources. The stability of a landform may change over time depending on factors such as precipitation and vegetative cover. On landforms that may oscillate between being erosional and depositional, the rate of deposition or erosion is critical, as it dictates whether

an archaeological resource becomes buried deeply enough to be permanently preserved or whether that resource becomes re-exposed at a later time.

In general, places with higher likelihood of buried archaeological resources should be depositional landforms that were also preferred by people in the past. Compared with erosional landforms, depositional landforms tend to have deep or thicker soils.

The SSFL archaeological district study (Bray et al., 2016) indicates that of all known archaeological sites at the project site (those with surface manifestation visible), more than half are located within 600 feet of a water source. This pattern suggests a tendency for prehistoric people to have preferred locations within close proximity to easily accessible water. Areas containing Saugus and Zamora soils are generally those where burial of archaeological materials could have reasonably occurred, particularly near Bell Creek, an area that appears to have been a preferred prehistoric activity area. Other pockets of colluvium and alluvium may be present onsite; however, these were much too localized to be captured in the geoarchaeological study, which was focused on relative potential based on general soil formation and map data.

At the project site, relatively thick Saugus and Zamora soils are found in low-lying areas with flat to gentle slopes. The parent materials in which these soils have formed originated from weathering of nearby bedrock, were carried downslope by water and gravity, and were deposited as alluvium and colluvium in lower-energy environments characterized by topographic lows and relatively flat to gentle slopes. In large part, these soil types generally follow the sinuous path of Bell Creek, which would have periodically carried sediments and deposited alluvium along relatively flat banks that characterize much of the landform adjacent to the channel. In some areas, topography conducive to development of Saugus and Zamora soils extends quite a distance from the Bell Creek channel, such as in the vicinity of the Burro Flats area, while in other settings, where topography is more restrictive, the soils form only a narrow swath along the channel.

Using proximity to water and the presence of deep soils (as a proxy for deposition), the site may be broadly divided into areas of Higher Likelihood and Lower Likelihood of buried cultural resources.

Higher Likelihood areas encompass gentler slopes on which unconsolidated sediments have been able to accumulate and form deep soils (Zamora and Saugus). Stream channels in such settings tend to be situated within broad, flat-bottomed, U-shaped canyons or flats. These areas would have offered access to water and to plants and animals that may not have been available in steeper, rockier areas. Because of the gentleness of the slopes in these areas, archaeological resources would be less likely to be eroded and more likely to become buried by sediments washed in by water (alluvium) or transported downslope from adjacent uplands (colluvium). Water carried along relatively unconfined stream reaches would have been more able to spread out during high-intensity rain events, dissipating both energy and tipping the balance toward deposition rather than erosion.

Lower Likelihood areas (all other areas within the project site not identified as Higher Likelihood) tend to encompass steeper slopes with thin soil types (Sedimentary Rock Land, Gaviota, Calleguas-Arnold, Badland). Because bedrock in such areas tends to be exposed at surface or very shallowly buried, there is a limited baseline potential for buried archaeological sites, except perhaps in localized depressions and hollows. Stream channels in Lower Likelihood areas tend to be confined within narrow, V-shaped ravines. These ravines may not have been attractive to humans, since archaeological sites near them tend to be situated at the tops of the slopes above them, rather than within the ravines themselves. Furthermore, because the ravines lack lateral space for channels to dissipate flow energy, the channels are prone to attain high-energy conditions and to erode and transport sediments through and out of the ravines.

Four of the sites (CA-VEN-1302, -1412, -1416, -1775) that were tested by Leidos' Extended Phase I testing (Leidos, 2015) were located within areas classified as Higher Likelihood for buried archaeological resources. Conversely, the other six sites (VEN-1414, -1418, -1420, -1428, -1772, -1773) subject to Extended Phase I testing are in Lower Likelihood areas.

Based on the results of the Extended Phase I testing, archaeological sites in Lower Likelihood areas were primarily ephemeral surface manifestations, and the presence of subsurface artifacts may result from natural and recent human disturbances to surface scatters. Conversely, with the exception of previously looted site CA-VEN-1775, sites located within Higher Likelihood areas contained more prehistoric artifacts and more secure or intact subsurface contexts. Tested sites in Lower Likelihood areas yielded an average of 2.8 precontact artifacts per site, while sites in Higher Likelihood areas yielded an average of 26.5 precontact artifacts per site (Leidos, 2015). Thus, the results of the Extended Phase I testing are consistent with expectations set forth in the geoarchaeological study (Lockwood, 2016).

4.4.1.7 Tribal Coordination

This section summarizes tribal coordination conducted as part of the project by each NASA, DOE, and DTSC.

NASA and DOE have been conducting consultation with SHPO, Advisory Council on Historic Preservation (ACHP), Native American tribes, and interested parties pursuant to Section 106 of the National Historic Preservation Act (NHPA) for the cleanup of their respective areas of responsibility within the project site. Although this consultation is unrelated to the CEQA process and the responsibilities of DTSC, the results of NASA and DOE consultation may be relevant to the impacts analysis and mitigation measures set forth in this PEIR and the three agencies have thus been working closely together. The consultation process for each agency is summarized as follows.

NASA

NASA used the process and documentation required to fulfill NEPA in lieu of the NHPA Section 106 consultation process, in accordance with 36 CFR 800.8(c). NASA consulted with SHPO, ACHP, the Santa Ynez Band of Chumash Indians, non-federally recognized Native American tribes, including Chumash, Tataviam, and Gabrielino Tongva, and over 30 other consulting

parties. The conclusion of the NASA consultation process was the preparation of a Programmatic Agreement (PA), which was executed on April 2, 2014. NASA concluded that cleanup within NASA-owned portions of the project site would adversely affect the Alfa, Bravo, and Coca Test Area Historic Districts; the nine individually eligible historic properties located within the historic districts; archaeological sites CA-VEN-1072 (Burro Flats Site Complex) and CA-VEN-1803; the Indian Sacred Site designated under Executive Order 13007; and the TCP.

NASA's PA provides several measures to reduce adverse effects to historic properties. One test stand and one control house within one historic district, either the Alfa or Bravo Test Area Historic Districts, must be preserved. All three historic districts must be subject to Historic American Engineering Record (HAER) documentation, and historic photos, historic narrative, videos, and oral histories regarding the test stands must be compiled and be posted on NASA's website. To reduce impacts to the TCP, NASA was required to form a Native American Advisory Board (later known as the SSFL Sacred Sites Council, which includes members of federally and non-federally recognized tribes as described earlier), prepare a formal NRHP nomination for the TCP, conduct an ethnographic study, backfill and reseed a portion of the area with native plants, and take measures to ensure that Native Americans have access to ceremonial sites. To reduce impacts to CA-VEN-1072 (Burro Flats Site Complex), NASA was required to thoroughly define the boundaries of CA-VEN-1072, create an Environmentally Sensitive Areas Action Plan, provide archaeological and tribal monitoring during remediation, request that DTSC exercise its AOC Exception, (see Section 3.3, *Regulatory Orders and Cleanup Requirements*, of this PEIR for more information about AOC exceptions) in order to avoid disturbance of CA-VEN-1072, and prepare a data recovery plan if avoidance is not possible. To reduce effects to other archaeological resources, NASA is required to conduct Extended Phase I testing in areas subject to project-related ground disturbance, evaluate newly identified archaeological sites, and provide protection measures for NRHP-eligible sites.

DOE

DOE initiated formal consultation with SHPO for the proposed action in 2009; the consultation relationship was renewed in 2014 and is ongoing. DOE is currently consulting with SHPO, Native American tribes, and other interested parties in accordance with NEPA, Section 106 of the NHPA, and appropriate Executive Orders and executive memoranda.

DOE initiated government-to-government consultation with the Santa Ynez Band of Chumash Indians in January 2014, in compliance with Executive Order 13175 and Section 106 of the NHPA. The Santa Ynez Band of Chumash Indians is also a cooperating agency in DOE's NEPA process. Consultation has also been ongoing between DOE and non-federally recognized tribes including Chumash, Tataviam, and Gabrielino Tongva, and members of the interested public.

DTSC

DTSC sent a letter to 11 local Native American tribes on March 12, 2014. The letter described the project and proposed to initiate consultation with tribal governments per the Governor's Executive Order B-10-11. Tribes contacted included the Barbareno/Ventureno Band of Mission Indians, the Coastal Band of the Chumash Nation, the San Manuel Band of Mission Indians, the

San Gabriel Band of Mission Indians, the Kern Valley Indian Council, the San Fernando Band of Mission Indians, the Santa Ynez Band of Chumash Indians, the Fernandeno Tataviam Band of Mission Indians, the Gabrielino Band of Mission Indians, the Gabrielino-Tongva Tribe, and the Kitanemuk and Yowlumne Tejon Indians.

One response to the March 12, 2014, letter has been received, from the Santa Ynez Band of Chumash Indians, who formally requested consultation with DTSC.

DTSC has been coordinating with the SSFL Sacred Sites Council, which includes representatives of federally and non-federally recognized tribes as previously described, to identify project impacts to cultural and tribal resources through attendance at NASA and DOE Section 106 meetings over the past several years. Although the NOP for this project was released prior to July 1, 2015, the date after which projects filing a NOP or Notice of Intent to Adopt (NOI) are required to comply with the provisions of AB 52, DTSC recognizes the importance of the tribal resources associated with the project site and is committed to coordinating with tribes in a manner consistent with AB 52.

On November 8, 2016, DTSC hosted a meeting for the SSFL Sacred Site Council to present materials related to the SSFL archaeological district and geoarchaeological studies and where tribes could provide information about resources of concern that could be impacted by the project. Tribal affiliations represented at the meeting included: Santa Ynez Band of Chumash Indians, Kizh Gabrieleno Band of Mission Indians, Fernandeno Tataviam Band of Mission Indians, Gabrielino Tongva/ Chumash, Chumash/ Tataviam/ Fernandeno, Chumash/ Fernandeno/ Ventureno, and Barbareno/Ventureno Band of Mission Indians. Tribes were invited to provide written comments on the materials presented or any other items of concern by February 16, 2017. No written comments were received. DTSC looks forward to continuing to coordinate with tribes through the environmental review and cleanup process.

4.4.1.8 Paleontological Resources

Previous paleontological resources studies have been conducted by NASA (covering a portion of Area I and all of Area II) and Boeing (covering a portion of Area I, and all of Area III and the Southern Undeveloped Area) (Corbett and Guttenberg, 2014). These studies assessed the paleontological potential of surficial and buried geological units to yield significant paleontological resources based on the results of background literature and geological map research, archival records searches, and field surveys. No previous paleontological study has been conducted for Area IV, the Northern Undeveloped Area, or offsite areas. A paleontological resources assessment was prepared by ESA in 2015 that built upon the previous studies using map and paleontological literature research; no additional survey or paleontological records searches were conducted as part of the assessment (Williams, 2015).

Geological Formations/Units in the Project Site Area

The project site is underlain by eight distinct sedimentary geological units from oldest to youngest: the shaley facies of the Chatsworth Formation (Kcsh); the sandy facies of the Chatsworth Formation (Kcs); the Simi Conglomerate Member (Tsi), upper sandstone (Tsus), and

upper unit (Tsu) of the Santa Susana Formation; two sandstone units (Tlsc and Tls) from the detrital sediments of Lindero Canyon geological unit; and Quaternary alluvium (Qa). No igneous or metamorphic rocks are mapped within the project site. The following sections discuss the geology and paleontology of these geological units, outline which geological units are present in each area, and provide their paleontological sensitivity ranking.

Chatsworth Formation

The late Cretaceous Chatsworth Formation (approximately 83–66 mya) was originally included as part of the northern California, Late Cretaceous, Chico Formation by Kew (1924), but was assigned formational status in southern California by Colburn et al. (1981). This formation, along with the Jurassic Bedford Canyon Formation and several other Late Cretaceous formations, represents some of the oldest sedimentary rock units in the Los Angeles area. Kew (1924) reported the thickness of the Chatsworth Formation to be ± 5,000 feet while Colburn et al. (1981) stated "The thickness of the exposed portion of the Chatsworth Formation is in excess of 1,830 m in the Simi Hills..." However, Colburn et al. (1981) and Bilodeau et al. (2007) suspect the thickness, including buried portions of the formation, is probably much greater. The Chatsworth Formation is considered to represent a submarine fan (turbidite) depositional setting with the predominately coarse-grained units interpreted to be proximal (nearshore) deposits and the finer-grained units distal (offshore) deposits (Colburn et al., 1981; Link, 1981; CH2M Hill, 2011; Corbett and Guttenberg, 2014). Submarine fans are wide and conical in shape and are the result of underwater, saturated sediment, gravity flows (Link 1981). Three sedimentary units of the Chatsworth Formation were mapped by Dibblee (1992, 2008): (1) a thick-bedded, indurated, medium sandstone layer interbedded with finer-grained siltstone layers (map unit Kcs); (2) cobble-rich conglomerate in an indurated sandstone matrix (map unit Kcg); and (3) finer-grained, crumbly clay shale (map unit Kcsh). Only the upper and lower units (Kcs and Kcsh) are mapped within the site boundaries, and the overlying Simi Conglomerate Member of the Santa Susana Formation represents an unconformable upper contact of the Chatsworth Formation.

The upper unit of the Chatsworth Formation (Kcs) is thought to be non-fossiliferous to sparsely fossiliferous while the lower, finer-grained unit (Kcsh) contains a greater assemblage of fossils (Kew, 1924; Colburn et al., 1981; Link, 1981; Corbett and Guttenberg, 2014). Saul and Alderson (1981) described a molluscan fauna from the lower Chatsworth Formation that included bivalves (at least 25 families), gastropods (at least 22 families), and cephalopods (at least seven families). Bottjer (1981) described a trace fossil assemblage from a sandy middle fan section of this unit, which consisted of six distinct forms, and Welton and Alderson (1981) reported on the fossil sharks from the lower Chatsworth Formation that included five taxa that were recovered from rocks using formic acid as a dissolution agent. These fossil sharks are the only known vertebrate fossils from the lower Chatsworth Formation.

Outcrops of the lower Chatsworth Formation (Kcsh) are restricted to the southeastern part of the Southern Undeveloped Area (Boeing). This geological unit is considered to have moderate to high paleontological sensitivity (**Table 4.4-5**). Surficial outcrops of the upper sandstone unit (Kcs) of the late Cretaceous (approximately 83–66 mya) upper Chatsworth Formation are found within the majority of Area I, Area II, a large portion of Area III, a large portion of Area IV, the

Northern Undeveloped Area, the majority of the Southern Undeveloped Area, and portions of the offsite areas. This geological unit is considered to have low to moderate paleontological sensitivity.

TABLE 4.4-5
PALEONTOLOGICAL SENSITIVITY OF GEOLOGICAL UNITS BY ADMINISTRATIVE AREA

Administrative Area	RP	Geological Units (Map Unit(S)	Approximate Age (Mya)	Sensitivity Category
Area I	Boeing	Upper Chatsworth Formation (Kcs)	83–66	Low to Moderate
		Quaternary alluvium	< 10,000 Years Ago	Low
Area I	NASA	Upper Chatsworth Formation (Kcs)	83–66	Low to Moderate
Area II	NASA	Upper Chatsworth Formation (Kcs)	83–66	Low to Moderate
Area III	Boeing	Upper Chatsworth Formation (Kcs)	83–66	Low to Moderate
		Santa Susana Formation (Tsu, Tsuv)	66–56	High
Area IV	DOE	Upper Chatsworth Formation (Kcs)	83–66	Low to Moderate
		Santa Susana Formation (Tsu)	66–56	High
Northern Undeveloped Area	DOE	Upper Chatsworth Formation (Kcs)	83–66	Low to Moderate
Northern Undeveloped Area	NASA	Upper Chatsworth Formation (Kcs)	83–66	Low to Moderate
Southern Undeveloped Area	Boeing	Lower Chatsworth Formation (Kcsh)	83–66	Moderate to High
		Upper Chatsworth Formation (Kcs)	83–66	Low to Moderate
		Santa Susana Formation (Tsi, Tsu, Tsuv)	66–56	High
		Detrital Sediments of Lindero Canyon (Tls and Tlsc)	15.5–13.5	Moderate
		Quaternary alluvium	< 12,000 Years Ago	Low
Offsite Areas	Boeing, NASA, And DOE	Upper Chatsworth Formation (Kcs)	83–66	Low to Moderate
		Santa Susana Formation (Tsi)	66–56	High
		Quaternary alluvium	< 10,000 Years Ago	Low

Santa Susana Formation

The terrestrial to marine Santa Susana Formation is early Eocene to Paleocene in age (approximately 66–56 mya) and overlies the Chatsworth Formation, with the boundary represented by a hiatus (a period of non-deposition/erosion). Dibblee (1992, 2008) mapped four members/units of the Santa Susana Formation: (1) clay and siltstone beds (map unit Tsu);

(2) indurated fine-grained sandstone with carbonate nodules and shell beds (map unit Tsus); (3) the Las Virgenes Sandstone Member, which is slightly crumbly bedded sandstone (map unit Tsuv); and (4) the Simi Conglomerate Member, which is a cobble conglomerate with a sandstone matrix (map unit Tsi). These units represent a change from deep marine to terrestrial deposition (Parker, 1983).

The Santa Susana Formation is approximately 1,000 meters thick and has a record of producing significant vertebrate and invertebrate fossils (Squires, 1999). Applegate (1975) reported on a new species of ratfish, *Ischyodus zinsmeisteri* from Paleocene deposits in the Simi Hills and at the time was the first species of *Ischyodus* described from the new world. *Turritella* (gastropods) and venericardias (bivalves) spp. from the Santa Susana Formation were used by Saul (1983) to refine the ages of Simi Valley Paleogene units, and Zinsmeister (1983) described the Paleocene molluscan fauna of Simi Hills, which included dozens of bivalves and gastropod taxa, four cephalopods, and one scaphopod taxon. The upper 100 meters of the formation had been previously determined to be less fossiliferous than the lower Santa Susana Formation due to poor preservation and lack of localities; however, Squires (1999) studied 560 megafossil specimens from 30 localities, including corals, bivalves, gastropods, crabs, and an echinoid, thus determining the upper Santa Susana Formation to be more fossiliferous than previously thought.

The southernmost portions of Area III is underlain by surficial deposits of upper claystone and siltstone unit (Tsu) and Las Virgenes Sandstone Member (Tsuv) of the Paleocene to Eocene (approximately 66–56 mya) Santa Susana Formation. Similarly, the southernmost portion of Area IV contains surficial deposits of the upper Santa Susana Formation. The Southern Undeveloped Area contains the Simi Conglomerate Member (Tsi), Las Virgenes Sandstone Member (Tsuv), and the upper geological unit (Tsu) of the Santa Susana Formation. Finally, portions of the offsite areas are underlain by the Simi Conglomerate Member of the Santa Susana Formation. The Santa Susana Formation is considered to have high sensitivity for significant paleontological resources.

Detrital Sediments of Lindero Canyon

The middle to late Miocene (approximately 15.5–5 mya) marine detrital sediments of Lindero Canyon contains two geological units: a light gray to white sandstone (unit Tls) and a light gray calcareous sandstone (unit Tlsc) (Dibblee, 1992, 2008). Dibblee (1992, 2008) separated the unit into two subunits: a light gray sandstone (Tlsc) and a light-gray to almost-white massive sandstone (Tls). He mentioned the unit may be equivalent to the upper Topanga Formation of Durrell (1954) or Calabasas Formation of Yerkes and Campbell (1979), both of which are known to be fossiliferous. The fossils from these formations include gastropods, bivalves, and fish scales (Yerkes and Campbell, 1979; Koch et al., 2004).

The upper and lower units of the middle to late Miocene (approximately 15.5–5 mya), marine "detrital sediments of Lindero Canyon" crop out in the southeastern corner of the Southern Undeveloped Area. The detrital sediments of Lindero Canyon are considered to have moderate sensitivity for significant paleontological resources.

Recent Quaternary Alluvium

Recent Quaternary alluvium (<12,000 years old) consists of eroded material from nearby older geological units deposited in lower lying canyons. Within the project site, the sediments are mainly derived from the Chatsworth Formation and are generally 5 feet or less in thickness (CH2M Hill, 2011).

Minor amounts of Holocene (<12,000 years old) Quaternary alluvium (Qa) are mapped on some canyon bottoms of Boeing's portion of Area I, the Southern Undeveloped Area, and the offsite areas. Because Quaternary alluvium is considered to be too young to preserve fossils, it is assigned low paleontological sensitivity; however, sometimes Quaternary alluvium can be shallowly underlain (a few feet or less in some cases) by older geological units that have higher paleontological sensitivity.

Geological Unit Summary

The project site is underlain by eight geological formations/units that range from approximately 83 million years old to recent (Table 4.4-5). These formations/units span the period between the late Cretaceous and Quaternary eras and have high (Santa Susana Formation), moderate to high (lower Chatsworth Formation), moderate, (detrital sediments of Lindero Canyon), low to moderate (upper Chatsworth Formation) and low with increasing sensitivity at depth (Quaternary alluvium) paleontological sensitivities. These geological units are all mapped on the surface, but may contain a thin veil of Quaternary alluvium overlying them (Corbett and Guttenberg, 2014).

4.4.2 Regulatory Background

Cultural and paleontological resources are considered under a variety of federal and state laws, regulations, guidelines, and policies. These are presented in the following pages as they are relevant to the analysis required by CEQA or potential future actions and approvals that may be associated with the proposed project.

4.4.2.1 Federal

Section 106 of the National Historic Preservation Act

The principal federal law addressing historic properties is the NHPA, as amended (16 USC Section 470f), and its implementing regulations (36 CFR Part 800). Section 106 of the NHPA requires federal agencies to consider the effect of their undertakings on historic properties, to provide the ACHP an opportunity to comment, and to resolve any adverse effects on historic properties through the process provided in the Section 106 regulations (36 CFR Part 800 et seq.). Historic properties consist of resources listed in or eligible for listing in the NRHP.

Because DTSC is not a federal agency and is not responsible for compliance with the NHPA, DTSC cannot make a determination of what resources in the project site constitute historic properties or the effect that federal undertakings necessary to implement the remediation would have on these resources. This section reviews the process for determining if cultural resources qualify as historic properties under the Section 106 implementing regulations for several reasons. First, both NASA and DOE are engaged in consultation with the SHPO, Indian Tribes, and

interested parties under Section 106 of the NHPA regarding adverse effects to historic properties resulting from implementation of their projects. Second, resources that qualify as historic properties under the NHPA (i.e., resources listed in or eligible for listing in the NRHP) are considered historical resources under CEQA because such properties are automatically included in the CRHR, as discussed below (PRC Section 5024.1(d)). Therefore, the NHPA is relevant to the identification and management of cultural resources under CEQA.

The steps of the Section 106 process are accomplished through consultation with the SHPO, federally recognized Indian tribes, local governments, and other interested parties. The goal of consultation is to identify potentially affected historic properties, assess effects to such properties, and seek ways to avoid, minimize, or mitigate any adverse effects on such properties. The agency also must provide an opportunity for public involvement (36 CFR 800.1(a)). Consultation with Indian tribes regarding issues related to Section 106 and other authorities (such as NEPA and Executive Order No. 13007) must recognize the government-to-government relationship between the Federal government and Indian tribes, as set forth in Executive Order 13175, 65 FR 87249 (November 9, 2000), and Presidential Memorandum of November 5, 2009.

National Register of Historic Places

The NRHP was established by the NHPA, as "an authoritative guide to be used by federal, state, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (36 CFR Section 60.2). The NRHP recognizes both historical-period and prehistoric archaeological properties that are significant at the national, state, and local levels. As indicated in NHPA Section 101(d)(6)(A) (16 USC Section 470a(d)(6)(A)), properties of traditional religious and cultural importance to a tribe are eligible for inclusion in the NRHP.

To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must meet one or more of the following four established criteria (36 CFR Section 60.4):

A. Are associated with events that have made a significant contribution to the broad patterns of our history;

B. Are associated with the lives of persons significant in our past;

C. Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Have yielded, or may be likely to yield, information important in prehistory or history.

Unless the property possesses exceptional significance, it must be at least 50 years old to be eligible for NRHP listing (36 CFR Section 60.4).

In addition to meeting the criteria of significance, a property must have integrity. Integrity is defined as "the ability of a property to convey its significance" (NPS, 1995). The NRHP recognizes seven qualities that, in various combinations, define integrity: location, design, setting,

materials, workmanship, feeling, and association. To retain historic integrity, a property must possess several, and usually most, of these seven aspects. Thus, the retention of the specific aspects of integrity is paramount for a property to convey its significance (36 CFR Section 60.4).

National Register Bulletin 38

The NHPA provides that historic properties may include TCPs of religious and cultural significance to Native American tribes. National Register Bulletin 38, *Guidelines for Evaluating and Documenting Traditional Cultural Properties* (NPS 1998), outlines in more detail how to evaluate and document these types of historic properties. TCPs are resources eligible for the NRHP based on traditional cultural significance derived from the "role the property plays in a community's historically rooted beliefs, customs, and practices" (NPS 1998:1). National Register Bulletin 38 defines a TCP as "one that is eligible for inclusion in the NRHP because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (NPS 1998:1). TCPs can embrace a wide range of historic properties, such as the location associated with a Native American group's origin or the origin of the world (cosmogony), or an urban neighborhood that is the traditional home of a particular cultural group and that still reflects and is associated with their beliefs and practices. Other examples of TCPs include places where traditional people historically have gone and continue to visit for ceremonial practices. These examples are not intended to be exhaustive, but instead to illustrate the range of possible TCPs. The identification and evaluation of TCPs can be conducted only by consultation with members of the relevant group of people that ascribe value to the resource, or through other forms of ethnographic research. TCPs retain an essential importance to the communities who value them. "Traditional cultural values are often central to the way a community or group defines itself, and maintaining such values is often vital to maintaining the group's sense of identity and self-respect. Properties to which traditional cultural value is ascribed often take on this kind of vital significance, so that any damage to or infringement upon them is perceived to be deeply offensive to, and even destructive of, the group that values them" (Parker and King, 1998:2).

Evaluation of Traditional Cultural Properties for NRHP Eligibility

Evaluation of a TCP requires that it be identified as such by the community that recognizes its traditional and cultural value. TCPs may be evaluated for their eligibility to the NRHP, in the same way that other types of resources are evaluated, considering the four NRHP criteria as set forth in 36 CFR Section 60.4 (criteria [a]–[d]).

As with any resource that is evaluated for listing on the NRHP, the TCP must be a tangible district, site, building, structure, or object (NPS, 1998). These terms are not meant to limit or exclude places from evaluation as a TCP; for instance, a bare grassy expanse at Mt. Tonaachaw in Truk, an island that is part of the Federated States of Micronesia, has been evaluated as a component of a TCP (NPS, 1998) because it is associated with at least two different spirits who reside on or are represented by the mountain. This consideration requires merely that the TCP be a tangible property, rather than the intangible beliefs or values alone.

Integrity

The TCP must have integrity, like any property eligible for listing on the NRHP. For traditional cultural resources this means that they must have "integrity of relationship" and "integrity of condition" (NPS, 1998). Integrity of relationship means simply that the specific place is integral and necessary to a traditional cultural group's beliefs or specific practices (NPS, 1998). National Register Bulletin 38 gives the example of two different cultures, one that believes that baptism at a specific river is necessary to accept individuals as members, and another that simply requires baptism in any body of water. For the first example, the river is integrated into beliefs and practices of a traditional culture and thus has integrity of relationship.

Integrity of condition requires simply that the TCP has not been altered in such a way that it no longer can serve its function for the traditional cultural group. For example, a pilgrimage route to a sacred site may no longer have integrity of condition if modern construction had physically interrupted the route and thus made it unusable. This requirement does not mean that the TCP must be completely intact without any changes to the setting or features of the resource; rather, the test is whether or not the resource can still function for traditional cultural purposes or whether the presence of new elements disrupts the function. National Register Bulletin 38 offers an example of a resource that has integrity despite changes to the setting. One reach of the Klamath River in northern California is within the ancestral and present territory of the Karuk people, and is the place where they carry out world renewal ceremonies and other rituals despite the presence of a modern highway, a U.S. Forest Service ranger station, and modern residences (NPS, 1998).

If the TCP has integrity of relationship and integrity of condition, evaluation progresses to the second step of evaluating the resource for eligibility for listing on the NRHP applying the criteria set forth in 36 CFR Section 60.4, as earlier described.

National Park Service Preservation Brief 36: Protecting Cultural Landscapes

The NPS defines cultural landscapes as an additional category of resources that can qualify as historic properties. Cultural landscapes consist of (NPS, 1994):

> *a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.*

The NPS defines four general types of cultural landscapes, which are not mutually exclusive: historic sites, historic designed landscapes, historic vernacular landscapes, and ethnographic landscapes (NPS, 1994):

1. A historic site is a landscape significant for its association with a historic event, activity, or person. Examples include battlefields and presidents' house properties.
2. A historic designed landscape is significant as a design or work of art; was consciously designed and laid out either by a master gardener, landscape architect, architect, or horticulturist to a design principle, or by an owner or other amateur according to a recognized style or tradition; has a historical association with a significant person, trend, or

movement in landscape gardening or architecture, or a significant relationship to the theory or practice of landscape architecture. Examples include parks, campuses, and estates.

3. A historic vernacular landscape is one whose use, construction, or physical layout reflects endemic traditions, customs, beliefs, or values; expresses cultural values, social behavior, and individual actions over time; is manifested in physical features and materials and their interrelationships, including patterns of spatial organization, land use, circulation, vegetation, structures, and objects. Examples include rural villages, industrial complexes, and agricultural landscapes.
4. An ethnographic landscape contains a variety of natural and cultural resources that associated people define as heritage resources, including plant and animal communities, geographic features, and structures, each with their own special local names. Examples include contemporary settlements, religious sacred sites, and massive geological structures. Small plant communities, animals, and subsistence and ceremonial grounds are often components [of the landscape].

Archaeological Districts

A district "possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development" (U.S. Department of the Interior, 1997). An archaeological district, then, is a type of district that is significant for its archaeological values and comprised primarily of archaeological sites, although it may also include buildings, structures, or objects.

Although it is composed of many separate elements, the significance of a district is fundamentally tied to it being a unified entity. A district comprises historically or functionally related properties that are united by their cultural affiliation, related elements of a pattern of land use, or historical development (U.S. Department of the Interior, 1997). Features within a district may lack individual distinction, but when taken together as a whole, may be historically significant.

A district can include sites that would meet the NRHP eligibility criteria as individual properties as well as components that are not individually significant. An archaeological district may include smaller sites that do not yield significant data when examined in isolation, but that may be significant when seen in connection with other related sites. For example, patterns in land use or settlement systems may become apparent when examining the geographic distribution of sites across a landscape.

A district must be a significant, identifiable entity. That is, it must contain important historical, architectural, archeological, engineering, or cultural values (U.S. Department of the Interior, 1990). Archaeological districts may be considered for eligibility under all NRHP criteria, but will often be significant under Criterion D (information potential) (U.S. Department of the Interior, 1997).

Sites, buildings, structures, or objects that add to the associations or values for which a district is significant are called contributing resources. A contributing resource is one that was present during the district's period of significance, relates to the documented significance of the district, and possesses historical integrity or is capable of yielding important information relative to the

district's significance (Little et al., 2000). A district may be defined to include noncontributing properties, so long as their inclusion does not affect the district's integrity or "the information potential of the district as a whole" (U.S. Department of the Interior, 1997).

A district must be within a definable geographic area that is distinct from its surrounding area. This area must be distinguishable by "density, scale, type, age, style of sites, buildings, structures, and objects, or by documented differences in patterns of historic development or associations" (U.S. Department of the Interior, 1997). However, a district boundary should rarely be defined by land ownership, management, or planning boundaries, but instead must be based on the direct relationship between the contributors of the district (U.S. Department of the Interior, 1990).

Properties within a district are usually contiguous (Little et al., 2000). However, if sites have a direct relationship through cultural affiliation, related elements of a pattern of land use, or historical development, but they are not contiguous and the space between the sites is not significant, then the property is best described as a discontiguous district. A discontiguous district is most appropriate where elements, such as sites, are spatially discrete, and where space between the elements, or sites, has not been demonstrated to be significant as it relates to the district and/or visual continuity is not a factor in the significance (Little et al., 2000).

Antiquities Act of 1906

The Antiquities Act of 1906 (USC, Title 16, Sections 431–433) is meant to protect cultural resources by requiring a fine and/or imprisonment be leveled upon any person "who shall appropriate, excavate, injure, or destroy any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned or controlled by the Government of the United States." Paleontological resources are also afforded federal protection under the CFR, Title 40, Section 1508.27, as a subset of scientific resources.

American Indian Religious Freedom Act

The American Indian Religious Freedom Act (42 USC Section 1996), enacted in 1978, establishes a policy of federal protection for traditional American Indian religious freedoms, including access to sacred sites and the freedom to worship through traditional rites.

Executive Order 13007

Executive Order 13007 (61 FR 26771; May 29, 1996) directs federal agencies, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions, to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of sacred sites. It also requires agencies to maintain the confidentiality of sacred sites, where appropriate. For the purposes of this executive order, sacred sites are considered to be any specific, discrete, narrowly delineated location on federal land that is identified by an Indian tribe or associated Native American individual to be representative of the Native American religion in discussion.

Native American Graves Protection and Repatriation Act

Requirements for responding to discoveries of Native American human remains and associated funerary objects on federal land are addressed under the Native American Graves Protection and Repatriation Act (Public Law 101-601, 25 USC Section 3001) and its implementing regulations found at 43 CFR Part 10. Whenever there is activity affecting or likely to affect Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony on federal or tribal lands, a federal agency must prepare a written Plan of Action (POA), in consultation with Indian tribes, that outlines the planned treatment, care, handling, and disposition of human remains funerary objects, sacred objects, or objects of cultural patrimony (43 CFR Part 10.3(c)(2)).

Archaeological Resources Protection Act of 1979

The Archaeological Resources Protection Act is meant to secure the protection of archaeological resources on public and tribal land for the present and future benefit of the American people. It is designed to prevent looting and the destruction of archeological resources and provides for civil and criminal penalties. It is also meant to increase information exchange between professional archaeologists, government officials, and private individuals concerning collections and archaeological resources. Under the Act, "archaeological resources" are defined as items: (1) of archaeological interest over 100 years old; and (2) found in an archaeological context on federal or Indian lands. The Act requires finders of such resources to obtain a federal permit before excavating, and potentially recovering these objects, consistent with the standards and requirements of the Federal Archaeology Program.

Paleontological Resources Preservation Act

The Paleontological Resources Preservation Act (PRPA) requires the Secretaries of the Interior and Agriculture to manage and protect paleontological resources on federal land using scientific principles and expertise (BLM, 2013). The PRPA provides authority for the protection of paleontological resources, including criminal and civil penalties for fossil theft and vandalism. The PRPA affirms the authority for many of the policies the federal land managing agencies, including the BLM, already have in place for the management of paleontological resources, such as issuing permits for collecting paleontological resources, curation of paleontological resources, and confidentiality of locational data (BLM, 2013).

Executive Order 13175

Executive Order 13175, titled Consultation and Coordination with Indian Tribal Governments, mandates that federal agencies conduct "regular and meaningful consultation and collaboration with Tribal officials in the development of federal policies that have Tribal implications…." It also requires agencies to participate in these consultation processes to strengthen government-to-government relations with Native American tribal entities.

4.4.2.2 State of California

The State implements the NHPA through its statewide comprehensive cultural resources surveys and preservation programs. The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation, implements the policies of the NHPA on a statewide level. The OHP also maintains the California Historic Resources Inventory. The SHPO is an appointed official who implements historic preservation programs within the State's jurisdictions.

California Environmental Quality Act

CEQA requires lead agencies to determine whether a proposed project would have a significant effect on the environment, including significant effects on historical or archaeological resources.

Under CEQA (PRC, Section 21084.1), a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment. The CEQA Guidelines (Title 14 CCR Section 15064.5) recognize that a historical resource includes: (1) a resource listed in, or determined to be eligible by the State Historical Resources Commission for listing in, the CRHR; (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); and (3) any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California by the lead agency, provided the lead agency's determination is supported by substantial evidence in light of the whole record. The fact that a resource does not meet the three criteria outlined above does not preclude the lead agency from determining that the resource may be a historical resource as defined in PRC Sections 5020.1(j) or 5024.1.

PRC Section 21084.1 and CEQA Guidelines Section 15064.5(a) establish three analytical categories for use in determining whether a historical resource exists for purposes of CEQA. These are (1) mandatory historical resources; (2) presumptive historical resources; and (3) discretionary historical resources. A mandatory historical resource is one that has been listed in, or determined to be eligible by the State Historical Resources Commission for listing in, the CRHR. Only an official determination by the State Historical Resources Commission triggers this mandatory determination.

Resources presumed to be historically or culturally significant include those that have been listed in a local register of historical resources, as defined in Section 5020.1(k) of the PRC, or identified as significant in a historical resources survey that meets specified criteria (e.g., PRC 5024.1[g]), unless the preponderance of evidence demonstrates otherwise.

A discretionary historical resource is a resource that does not fit within the mandatory or presumptive categories, but that is determined to be a historical resource in the exercise of the lead agency's discretion. This includes, in relevant part, "[a]ny object . . . site, area, place . . . . which a lead agency determines to be historically significant or significant in the . . . cultural

annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record" (CEQA Guidelines Section 15064.5, subd. (a)(3)). A lead agency evaluating potential project impacts under CEQA therefore has broad discretion to determine whether a particular resource that may be affected by a proposed project is a historical resource for purposes of CEQA. When such a determination is made, the criteria to be applied include the criteria for listing on the CRHR.

If a lead agency determines that an archaeological site is a historical resource, the provisions of Section 21084.1 of CEQA and Section 15064.5 of the CEQA Guidelines apply. If a project may cause a substantial adverse change (defined as physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired) in the significance of a historical resource, the lead agency must identify potentially feasible measures to mitigate these effects (CEQA Guidelines Sections 15064.5(b)(1), 15064.5(b)(4)).

If an archaeological site does not meet the criteria for a historical resource contained in the CEQA Guidelines, then the site may be treated in accordance with the provisions of Section 21083, which is a unique archaeological resource. As defined in Section 21083.2 of CEQA a "unique" archaeological resource is an archaeological artifact, object, or site, about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information
- Has a special and particular quality such as being the oldest of its type or the best available example of its type
- Is directly associated with a scientifically recognized important prehistoric or historic event or person

If an archaeological site meets the criteria for a unique archaeological resource as defined in Section 21083.2, then the site is to be treated in accordance with the provisions of Section 21083.2, which state that if the lead agency determines that a project would have a significant effect on unique archaeological resources, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place (Section 21083.1(a)). If preservation in place is not feasible, mitigation measures shall be required.

The CEQA Guidelines note that if an archaeological resource is neither a unique archaeological nor a historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment (CEQA Guidelines Section 15064.5(c)(4)).

California Register of Historical Resources

The CRHR is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). The criteria for eligibility for the CRHR are based

upon NRHP criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the CRHR, including California properties formally determined eligible for, or listed in, the NRHP.

To be eligible for the CRHR, a resource must be significant at the local, state, and/or federal level under one or more of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage
2. Is associated with the lives of persons important in our past
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values
4. Has yielded, or may be likely to yield, information important in prehistory or history

A resource eligible for the CRHR must meet one of the criteria of significance described above, and retain enough of its historic character or appearance (integrity) to be recognizable as a historical resource and to convey the reason for its significance. It is possible that even if a resource does not retain sufficient integrity to meet the criteria for listing in the NRHP, but it may still be eligible for listing in the CRHR.

Additionally, the CRHR consists of resources that are listed automatically and those that must be nominated through an application and public hearing process. The CRHR automatically includes the following:

- California properties listed on the NRHP and those formally determined eligible for the NRHP
- California Registered Historical Landmarks from No. 770 onward
- Those California Points of Historical Interest that have been evaluated by the OHP and have been recommended to the State Historical Commission for inclusion on the CRHR

Other resources that may be nominated to the CRHR include:

- Historical resources with an NRHP code of 3 through 5 (those properties identified as eligible for listing in the NRHP, the CRHR, and/or a local jurisdiction register)
- Individual historical resources
- Historical resources contributing to historic districts
- Historical resources designated or listed as local landmarks, or designated under any local ordinance, such as an historic preservation overlay zone

Another category of "historical resources" are those "deemed significant pursuant to criteria set forth in PRC Section 5024.1(g), which states that "[a] resource identified as significant in an historical survey may be listed in the CRHR if the survey meets all of the following criteria:

1. The survey has been or will be included in the State Historic Resources Inventory.

2. The survey and the survey documentation were prepared in accordance with…procedures and requirements (of the [California] OHP).
3. The resource is evaluated and determined (by the OHP) to have a significance rating of Category 1 to 5 (on the DPR Historic Resources Inventory Form).
4. If the survey is 5 years or more old at the time of its nomination for inclusion in the CRHR, the survey is updated to identify historic resources which have become eligible or ineligible due to changed circumstances or further documentation and those which have been demolished or altered in a manner that substantially diminished the significance of the resource.

Resources identified by such surveys are presumed to be historically or culturally significant unless the preponderance of evidence demonstrates otherwise.

TCPs may also be eligible for the CRHR under CEQA Guidelines Section 15064.5(a)(3). Section 15064.5 provides that, in general, a resource not listed in state or local registers of historical resources shall be considered by the lead agency to be historically significant if the resource meets the criteria for listing in the CRHR.

Section 15064.5(e) of the CEQA Guidelines requires that excavation activities be stopped whenever human remains are uncovered and that the county coroner be called in to assess the remains. If the county coroner determines that the remains are those of Native Americans, the NAHC must be contacted within 24 hours. At that time, Section 15064.5(d) of the CEQA Guidelines directs the lead agency to consult with an appropriate Native American (most likely descendant/MLD) as identified by the NAHC and directs the lead agency (or applicant), under certain circumstances, to develop an agreement with the Native Americans for the treatment and disposition of the remains.

Archaeological Districts in State Law

The CRHR includes resources determined to be significant under one or more criteria (Criteria 1 through 4) (PRC Section 5024.1[a]). Resources that can be listed in the CRHR include both individual resources and historic districts. PRC Section 5024.1[e] indicates that the CRHR may include historical resources contributing to the significance of an historic district, as well as historical resources and historic districts designated as city or county landmarks. The CRHR also includes resources listed in the NRHP, which can include districts.

As discussed earlier, the CEQA Guidelines (Section 15064.5) state that an historical resource can be: (1) a resource listed in, or determined to be eligible for listing in, the CRHR (which could include a district); (2) a resource included in a local register of historical resources or identified as significant in a historical resource survey; or (3) any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant. Although “district” is not specifically called out, “district(s)” would fall within the resource type categories of “site,” “area,” or “place.”

Public Resources Code 5097.9

PRC Section 5097.9 requires that no public agency (or private party using or occupying public property) interfere with "the free expression or exercise of Native American religion as provided in the United States Constitution and the California Constitution." Specifically, no part shall cause "severe or irreparable damage to any Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine located on public property, except on a clear and convincing showing that the public interest and necessity so require."

Public Resource Code 5097.98

PRC Section 5097.98, as amended by Assembly Bill 2641, provides procedures in the event human remains of Native American origin are discovered during project implementation. PRC Section 5097.98 requires that no further disturbances occur in the immediate vicinity of the discovery, that the discovery is adequately protected according to generally accepted cultural and archaeological standards, and that further activities take into account the possibility of multiple burials. PRC Section 5097.98 also requires the NAHC, upon notification by a County Coroner, to designate and notify a Most Likely Descendant (MLD) regarding the discovery of Native American human remains. Once the MLD has been granted access to the site by the landowner and inspected the discovery, the MLD then has 48 hours to provide recommendations to the landowner for the treatment of the human remains and any associated grave goods. In the event that no descendant is identified, or the descendant fails to make a recommendation for disposition, or if the land owner rejects the recommendation of the descendant, the landowner may, with appropriate dignity, reinter the remains and burial items on the property in a location that will not be subject to further disturbance.

Public Resources Code 5097.99

PRC Section 5097.99 prohibits acquisition or possession of Native American artifacts or human remains taken from a Native American grave or cairn after January 1, 1984, except in accordance with an agreement with the NAHC.

Public Resources Code 5097.993 and 5097.994

This section establishes as a misdemeanor the unlawful and malicious excavation, injury, destruction, or defacement of any property eligible for listing in the CRHR, including "any historic or prehistoric ruins, any burial ground, any archaeological or historic site, any inscriptions made by Native Americans at such site, any archaeological or historic feature of a Native American historic, cultural, or sacred site" located on public land or on private land, by a person other than the landowner.

Health and Safety Code 7050.5–7055

Health and Safety Code Sections 7050.5–7055 provide for punishment relating to the intentional disturbance, mutilation, or removal of interred human remains as a misdemeanor. In some cases, the intentional disturbance, mutilation, or removal can be considered a felony. The Health and Safety Code Section 7050.55 requires that in the event human remains are discovered, the County Coroner be contacted to determine the nature of the remains. In the event the remains are

determined to be Native American in origin, the Coroner is required to contact the NAHC within 24 hours to relinquish jurisdiction.

Governor's Executive Order B-10-11

Executive Order B-10-11 was signed by California Governor Edmund G. Brown, Jr., in September, 2011. The order created a position of Tribal Advisor to the Governor. The Tribal Advisor is responsible for implementing effective government-to-government consultation between the Governor's administration and California Indian Tribes.

The order also states that:

> *It is the policy of this Administration that every state agency and department subject to [the Governor's] executive control shall encourage communication and consultation with California Indian Tribes. Agencies and departments shall permit elected officials and other representatives of tribal governments to provide meaningful input into the development of legislation, regulations, rules, and policies on matters that may affect tribal communities.*

For the purpose of the Executive Order, the term "California Indian Tribe" refers to all federally recognized tribes and "other California Native Americans."

Assembly Bill 52

Assembly Bill (AB) 52 was approved by California State Governor Edmund G. Brown, Jr., on September 25, 2014. The act amended California PRC Section 5097.94, and added PRC Sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3. AB 52 applies specifically to projects for which a NOP or a NOI a Negative Declaration or Mitigated Negative Declaration (MND) will be filed on or after July 1, 2015. The primary intent of AB 52 was to include California Native American tribes early in the environmental review process and to establish a new category of resources related to Native Americans that require consideration under CEQA, known as tribal cultural resources. PRC Section 21074(a)(1) and (2) defines tribal cultural resources as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" that are either included or determined to be eligible for inclusion in the California Register or included in a local register of historical resources, or a resource that is determined to be a tribal cultural resource by a lead agency, in its discretion and supported by substantial evidence. Tribal cultural resources may include historical resources, unique archaeological resources, and non-unique archaeological resources. On July 30, 2016, the California Natural Resources Agency adopted the final text for tribal cultural resources update to Appendix G of the CEQA Guidelines, which was approved by the Office of Administrative Law on September 27, 2016.

PRC Section 21080.3.1 requires that within 14 days of a lead agency determining that an application for a project is complete, or a decision by a public agency to undertake a project, the lead agency provide formal notification to the designated contact, or a tribal representative, of California Native American tribes that are traditionally and culturally affiliated with the geographic area of the project (as defined in PRC Section 21073) and who have requested in

writing to be informed by the lead agency (PRC Section 21080.3.1(b)). Tribes interested in consultation must respond in writing within 30 days from receipt of the lead agency's formal notification and the lead agency must begin consultation within 30 days of receiving the tribe's request for consultation (PRC Sections 21080.3.1(d) and 21080.3.1(e)).

PRC Section 21080.3.2(a) identifies the following as potential consultation discussion topics: the type of environmental review necessary; the significance of tribal cultural resources; the significance of the project's impacts on the tribal cultural resources; project alternatives or appropriate measures for preservation; and mitigation measures. Consultation is considered concluded when either: (1) the parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or (2) a party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached (PRC Section 21080.3.2(b)).

If a California Native American tribe has requested consultation pursuant to Section 21080.3.1 and has failed to provide comments to the lead agency, or otherwise failed to engage in the consultation process, or if the lead agency has complied with Section 21080.3.1(d) and the California Native American tribe has failed to request consultation within 30 days, the lead agency may certify an EIR or adopt an MND (PRC Section 21082.3(d)(2) and (3)).

PRC Section 21082.3(c)(1) states that any information, including, but not limited to, the location, description, and use of the tribal cultural resources, that is submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public without the prior consent of the tribe that provided the information. If the lead agency publishes any information submitted by a California Native American tribe during the consultation or environmental review process, that information shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. Confidentiality, does not however apply to data or information that are, or become publicly available, are already in lawful possession of the project applicant before the provision of the information by the California Native American tribe, are independently developed by the project applicant or the project applicant's agents, or are lawfully obtained by the project applicant from a third party that is not the lead agency, a California Native American tribe, or another public agency (PRC Section 21082.3(c)(2)(B).

Although the NOP for this project was released on November 22, 2013, prior to July 1, 2015, the date after which projects are required to comply with AB 52, DTSC, as a state agency, is committed to implementing Executive Order B-10-11 and to carry out consultation in a manner consistent with the goals of AB 52 to identify tribal cultural resources that might be impacted by the project.

4.4.2.3 Local

Ventura County General Plan

Specific policies within the current General Plan for the County of Ventura that apply to cultural resources include (County of Ventura, 2010):

Cultural Resources Goals

1.8.1.1: Identify, inventory, preserve and protect the paleontological and cultural resources of Ventura County (including archaeological, historical and Native American resources) for their scientific, educational and cultural value.

1.8.1.2: Enhance cooperation with cities, special districts, other appropriate organizations, and private landowners in acknowledging and preserving the County's paleontological and cultural resources.

Cultural Resources Policies

1.8.2.1: Discretionary developments shall be assessed for potential paleontological and cultural resource impacts, except when exempt from such requirements by CEQA. Such assessments shall be incorporated into a countywide paleontological and cultural resource data base.

1.8.2.2: Discretionary development shall be designed or re-designed to avoid potential impacts to significant paleontological or cultural resources whenever possible. Unavoidable impacts, whenever possible, shall be reduced to a less-than-significant level and/or shall be mitigated by extracting maximum recoverable data. Determinations of impacts, significance and mitigation shall be made by a qualified archaeological (in consultation with recognized local Native American groups), historical or paleontological consultants, depending on the type of resource in question.

1.8.2.3: Mitigation of significant impacts on cultural or paleontological resources shall follow the Guidelines of the State Office of Historic Preservation, the State Native American Heritage Commission, and shall be performed in consultation with professionals in their respective areas of expertise.

1.8.2.4: Confidentiality regarding locations of archaeological sites throughout the County shall be maintained in order to preserve and protect these resources from vandalism and the unauthorized removal of artifacts.

1.8.2.5: During environmental review of discretionary development the reviewing agency shall be responsible for identifying sites having potential archaeological, architectural or historical significance and this information shall be provided to the County Cultural Heritage Board for evaluation.

4.4.3 Thresholds of Significance

For the purposes of this PEIR, DTSC used the checklist questions in Appendix G of the CEQA Guidelines as thresholds of significance to determine whether the project would have a significant environmental impact regarding cultural resources. Although the NOP was filed before July 1, 2015, prior to which projects are required to comply with provisions of AB 52, DTSC has adopted the Appendix G checklist question pertaining to Tribal Cultural Resources as part of this

Cultural Resources section for the purposes of this evaluation (see 4.4-2) rather than adopting a separate Tribal Cultural Resources section. Based on the nature, size, and scope of the project and the potential for impacts to cultural resources, the following criteria are included for evaluation in this PEIR.

Would the project:

4.4-1 Cause a substantial adverse change in the significance of archaeological resources qualifying as historical resources or unique archaeological resources as defined in CEQA Guidelines Section 15064.5 (refer to Impact Statements 4.4-1a and 4.4-1b)?

4.4-2 Cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

4.4-3 Cause a substantial adverse change in the significance of built environment resources qualifying as historical resources as defined in CEQA Guidelines Section 15064.5 (refer to Impact Statements 4.4-3a and 4.4-3b)?

4.4-4 Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature (refer to Impact Statements 4.4-4a and 4.4-4b)?

4.4-5 Disturb any human remains, including those interred outside of formal cemeteries (refer to Impact Statements 4.4-5a and 4.4-5b)?

According to CEQA Guidelines (Section 15064.5(b) and Section 21084.2), a project with an effect that may cause a substantial adverse change in the significance of a historical resource or a tribal cultural resource, respectively, is a project that may have a significant effect on the environment. The guidelines further state that a substantial adverse change in the significance of a resource means the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historic resource would be materially impaired. Actions that would materially impair the significance of a historical or tribal cultural resource are any actions that would demolish or adversely alter those physical characteristics of a resource that convey its historical significance and qualify it for inclusion in the CRHR or in a local register or survey that meet the requirements of PRC Sections 5020.1(k) and 5024.1(g). A lead agency must also take into account impacts to unique archaeological resources (CEQA Guidelines Section 15064.5(c)(1)-(4)).

4.4.4 Methodology

Analysis of impacts on cultural and paleontological resources was based on consideration of the nature and scope of project activities, the location of known cultural and paleontological resources, and the potential for the inadvertent discovery of unknown cultural or paleontological resources. The impacts analysis is based on the results of several studies, which were described in detail earlier and are summarized below and in the following pages.

4.4.4.1 Archaeological Resources

The most recent archaeological survey of NASA Areas I (Liquid Oxygen Plant) and Area II was conducted in 2014 by JMA (Corbett et al., 2014). The Northern Undeveloped Area was surveyed in 2010 by CRM Tech (Hogan and Tang, 2010). Area IV was subject to systematic pedestrian archaeological survey in 2001 by W&S Consultants (W&S, 2001). Between July 2010 and August 2012, JMA conducted archaeological monitoring for a USEPA radiological characterization study for portions of Area IV and the Northern Undeveloped Area (Corbett et al., 2012). Between 2011 and 2014, Leidos conducted archaeological survey, site verification, and monitoring during the Phase 3 soil chemical sampling in Area IV and the Northern Undeveloped Area (Bryne, 2014). In 2013–2014, JMA completed a pedestrian survey of Area I, Area III, and the Southern Undeveloped Area (Corbett, 2014).

In 2015, Leidos conducted Extended Phase I testing at 10 sites in Area IV to delineate site boundaries and evaluate their eligibility for listing in the NRHP (Leidos, 2015).

A geoarchaeological assessment was conducted to identify areas of higher sensitivity for buried archaeological resources (Lockwood, 2016). In addition, an Archaeological District Study was conducted, which resulted in the identification of an archaeological district within the project site (Bray et al., 2016).

4.4.4.2 Tribal Cultural Resources (SSFL TCP)

Lawson (2013) was commissioned by NASA to conduct a traditional cultural properties and cultural landscape assessment for Area I (NASA) and Area II and the vicinity. The study investigated the existence and extent of a TCP and significant cultural landscape using existing documentation to compile a historic context and ethnography, as well as conducting interviews with individuals and groups (Native American communities with ties to the region, ethnographers, historians, anthropologists, and archaeologists) likely possessing relevant information that would be pertinent to the determination of traditional cultural properties, such as oral histories, tribal significance, experiences, and remembrance of the area previous to the Rocketdyne acquisition. In conclusion, the assessment did identify a TCP associated with the Burro Flats Site Complex and for the purposes of Section 106 NASA treated Area I (NASA portion) and Area II as a TCP (NASA, 2013:3-15).

4.4.4.3 Built Environment Resources

Three main studies addressing built environment resources have been conducted. ACI and Weitze Research conducted a historic resource assessment survey of 135 NASA-owned built

environment resources in Areas I and II in 2007 (ACI and Weitze, 2009). A Historic Structures/Sites Report was completed for Area IV in 2009 (Post/Hazeltine Associates, 2009). Finally, in 2010, Post/Hazeltine Associates completed a Historic Structures/Sites Report in Area I (Boeing) and Area III (Post/Hazeltine Associates, 2010).

4.4.4.4 Paleontological Resources

Previous paleontological studies conducted in connection with the project site were prepared by CH2M Hill (2011) and JMA (2014). The CH2M Hill (2011) study assessed the potential for remediation activities to impact significant, nonrenewable paleontological resources within the NASA portion (the northwestern corner of Area I and all of Area II) of the project site, but did not include the Northern Undeveloped Area. The JMA (2014) study assessed paleontological resources potential for part of Area I (Boeing), Area III, and the Southern Undeveloped Area. ESA (2015) completed a paleontological resources assessment that synthesized the previous studies, reviewed published and available unpublished geological and paleontological literature, and presented a comprehensive assessment of geological and paleontological resources in the project site, including Area IV, the Northern Undeveloped Area, and offsite areas.

4.4.4.5 Description of Potential Program and Project Level Impacts

Possible activities that may occur during overall site cleanup (program level) that may impact cultural and paleontological resources include (but are not limited to):

- Excavation of soil for remediation
- Setting up staging areas for equipment storage, maintenance/fueling, soil stockpiling, and decontamination
- Excavation of potential onsite soil borrow areas
- Grubbing or clearing of vegetation
- Operation of heavy equipment
- Excavation of wells and installation of facilities for soil vapor extraction, GETS, air sparging and vapor extraction, and monitored natural attenuation
- Bedrock removal for Strontium-90

Initial activities (project level) that may impact cultural and paleontological resources include:

- The presence and operation of equipment, workers, and vehicles during soil remediation
- Setting up staging areas for equipment storage, maintenance/fueling, and decontamination
- Removal of soil from the project site through excavation
- Vegetation clearance
- Building demolition activities

These types of activities could result in significant impacts to cultural and paleontological resources, which would require measures to avoid or mitigate substantial adverse changes in the

significance of archaeological resources qualifying as either historical resources or unique archaeological resources, tribal cultural resources, built environment resources, unique paleontological resources, or human remains.

Ground-disturbing construction activities associated with the project could directly impact archaeological resources by damaging and displacing artifacts, diminishing site integrity, and altering the characteristics that make the resources significant both individually and as contributors. In addition, in the case of archaeological resources, tribal cultural resources, and built environment resources, impacts can occur to the setting (or surroundings) of a resource even if the resource is not directly damaged. Indirect effects are caused by the action and are later in time or farther removed in distance. Indirect effects to cultural resources could include visual, auditory, and atmospheric effects, as well as disturbances to resources caused by erosion or by an increased number of visitors to the site (i.e., construction workers and long-term employees).

4.4.5 Analysis of Impacts

The following text describes the potential environmental impacts related to cultural resources associated with implementing the overall site cleanup and initial activities, demarcated as impact "a" and "b" respectively. As presented in Section 3.7, the initial activities include eight different projects. Depending on the degree to which impacts of the initial activities would be similar to or different from each other, the impact analysis for the initial projects for some thresholds has been combined accordingly (i.e., the number of separate discussions for impact for each threshold ranges from one to eight). Each impact discussion concludes with a significance determination.

4.4.5.1 Archaeological Resources

Program Assessment

Impact 4.4-1a: Would implementation of the **overall site cleanup** cause a substantial adverse change in the significance of archaeological resources qualifying as historical resources or unique archaeological resources as defined in CEQA Guidelines Section 15064.5?

Overall Site Cleanup (Impact 4.4-1a)

Known Individual Archaeological Resources

A total of 144 known individual archaeological sites and 136 isolates are located within or immediately adjacent to the project site. Of these, a total of 31 sites are considered historical resources per CEQA Guidelines Section 15064.5. Six sites (CA-VEN-151/157, -152/161, -153/156, -154/155, -158, and -159/160) that make up part of the Burro Flats Site Complex are listed in the NRHP and CRHR, and the remaining 16 sites that make up the complex (CA-VEN-1065, -1066, -1067, -1068, -1072 West; -1072 Locus 5, -1072 Locus 6, -1072 Locus 12, -1072 Locus 15 -1072 Locus 20, -1072 Locus 23, -1072 Locus 24, -1072 Locus 31, -1823, -1824, and -1825) are likewise considered eligible for listing in the NRHP and CRHR and are considered historical resources under CEQA.

As a result of the Extended Phase I testing conducted in Area IV in 2015, eight sites (CA-VEN-1302, -1412, -1414, -1416, -1418, -1772, -1773, and -1775) were recommended individually eligible for listing in the NRHP under Criterion D and are likewise considered eligible for listing in the CRHR and are considered historical resources under CEQA (Bryne, 2015).

Resources CA-VEN-1800 and -1803, which are located within Area II, have not been formally evaluated for significance; however, they are being treated as individually eligible for listing in the NRHP by NASA as part of its NEPA environmental review and Section 106 consultation.

Two sites (CA-VEN-1420 and -1428) were recommended ineligible for individual listing in the NRHP and are likewise considered not individually eligible for the CRHR and are not historical resources or unique archaeological resources per CEQA (Bryne, 2015). In addition, the 136 isolates are not considered individually eligible for inclusion in the NRHP or CRHR, nor do they qualify as historical resources or unique archaeological resources under CEQA.

The remaining 111 archaeological resources have not been evaluated for individual listing in the NRHP or the CRHR or for their qualification as historical resources or unique archaeological resources under CEQA Section 15064.5 and PRC Section 21083.2, respectively.

Excavation of affected soils proposed as part of the overall site cleanup would involve the physical excavation of soils with the use of heavy equipment and partial backfilling of excavated areas. Excavation to remove soil with concentrations above cleanup levels would occur at designated areas throughout the project site. Other activities that could directly impact archaeological resources include vegetation removal, establishment of staging areas, and operation of vehicles, as discussed earlier.

Areas requiring remediation have been identified and, as such, it is possible to identify archaeological resources that overlap with such areas and may be affected by future cleanup activities. However, because the overall site cleanup is being evaluated at a programmatic level, specific project locations and remediation technologies for the entire site have yet to be finalized. If any future individual project were to impact any of the 31 individual archaeological resources that qualify as historical resources, or any of the 111 individual unevaluated archaeological resources located within the project site that are subsequently demonstrated to qualify as historical resources, disturbance could result in a substantial adverse change in the significance of the resource, through demolition or alteration of those physical characteristics of the historical resource that convey its historical significance and qualify it for inclusion in the CRHR or in a local register or survey that meet the requirements of PRC Sections 5020.1(k) and 5024.1(g).

Implementation of Mitigation Measures CUL-1, CUL-2, CUL-3, CUL-4, CUL-5, and CUL-7 would avoid, minimize, or reduce impacts to known individual archaeological resources that qualify as historical resources or are unevaluated. Mitigation Measure CUL-1 (Cultural Resources Personnel Professional Qualifications Standard) requires that a qualified professional archaeologist oversee all cultural resources work. Mitigation Measure CUL-2 (Preparation of a Cultural Resources Management Plan [CRMP]) requires that a management plan outlining responsibilities and procedures be prepared and that DTSC approve the plan. Mitigation Measure

CUL-3 (Worker Resources Sensitivity Program) requires that onsite personnel be provided cultural resources sensitivity training. Mitigation Measure CUL-4 (Avoidance and Preservation in Place) requires avoidance of resources where feasible, resource eligibility evaluations, and data recovery of resources that cannot be avoided. Mitigation Measure CUL-5 (Archaeological and Native American Monitoring) requires a monitoring program be implemented. Mitigation Measure CUL-7 (Curation of Project Materials) requires curation of artifact collections in a local accredited repository. In some circumstances, documentation and data recovery as mitigation for impacts to an individual historical resource of an archaeological nature (as required by Mitigation Measure CUL-4 (Avoidance and Preservation in Place) would not mitigate the effects to a point where no significant impact on the environment would occur. Data recovery as mitigation for historical resources that are eligible for the CRHR under Criterion 4, or that derive their significance from their scientific value or data potential, may effectively mitigate impacts to a less-than-significant level. However, for historical resources that are eligible to the CRHR under Criteria 1, 2, or 3, data recovery may not adequately mitigate impacts to those aspects of the resource that convey its significance and make it eligible for listing in the CRHR, and even with the implementation of these mitigation measures, impacts to such resources from overall site cleanup may not be mitigated to a less-than-significant level.

In addition to direct impacts, individual archaeological sites qualifying as historical resources or unique archaeological resources could incur significant indirect impacts. Such impacts to significant resources would result from a change in the historical setting of the resources, as a result of the massive amount of soil removal that would permanently affect the appearance of the surrounding area. Indirect impacts could also result from disturbances to resources caused by erosion or by an increased number of vehicles and personnel at the site, which could expose or damage archaeological resources. In addition to Mitigation Measures CUL-1 through CUL-5 and CUL-7, implementation of Mitigation Measure CUL-8 (Annual Site Condition Verification), requiring visiting the individual sites annually to document whether indirect impacts are occurring and if impacts are observed to develop protections based on the type of impact occurring, would minimize or reduce some long-term and indirect impacts to historical resources and unique archaeological resources. However, this measure may not mitigate indirect impacts to individual known archaeological resources to a less-than-significant level.

Archaeological District

The Simi Hills Archaeological District (District) has been identified within the project site. The District has been evaluated as eligible for listing in the NRHP and CRHR under Criteria A/1, C/3, and D/4. Contributors to the significance of the District must retain sufficient integrity to contribute, or have the potential to contribute, information to regional research themes, such as the understanding of local patterns of prehistoric settlement and subsistence, prehistoric lithic technology, and prehistoric rock art in the Simi Hills, in particular through the presence of archaeological data and to the resource's spatial relationships to other resources and to the environment. All of the 132 prehistoric sites and the prehistoric components of the six multicomponent archaeological sites identified to date within the project site are contributors to the significance of the District (see Table 4.5-1). Because isolates lack contextual information

necessary to address regional research questions, isolates are not considered contributors to the District.

Because the overall site cleanup could cause direct and indirect impacts to the 138 known District contributors, the overall site cleanup could cause a substantial adverse change in the significance of the District. The District is a non-renewable resource and possesses significant archaeological, cultural, and educational value to our understanding of the lifeways of Native American inhabitants of the region and prehistoric settlement and subsistence patterns in the Simi Hills. Implementation of Mitigation Measures CUL-1 (Cultural Resources Personnel Professional Qualifications Standard), CUL-2 (Preparation of a Cultural Resources Management Plan [CRMP]), CUL-3 (Worker Cultural Resources Sensitivity Program), CUL-4 (Avoidance and Preservation in Place), CUL-5 (Archaeological and Native American Monitoring), CUL-7 (Curation of Project Materials), and CUL-8 (Annual Site Condition Verification) as described earlier, in conjunction with CUL-9 (Comprehensive District Study and National Register Nomination), and CUL-10 (Burro Flats Complex Documentation and National Register Nomination) would avoid, minimize, reduce, or compensate for the impact of the overall site cleanup on the District. Mitigation Measure CUL-9 requires that archaeological data collected through destructive techniques such as testing and data recovery as a result of the overall site cleanup be documented in a comprehensive District Study to be made available for future researchers and that a National Register Nomination for the District be prepared. Mitigation Measure CUL-10 requires that the Burro Flats Site Complex be documented and a National Register Nomination prepared. However, because impacts to archaeological sites that contribute to the significance of the District would result in damage to the integrity of the District and a loss of data to adequately inform relevant regional research themes as described earlier in this section, the impacts to the District resulting from overall site cleanup would not be mitigated to a less-than-significant level.

Unknown Archaeological Resources

The geoarchaeological study prepared for the project (Lockwood, 2016) indicated that certain portions of the project site were sensitive for the presence of buried archaeological resources. The study identified areas of Higher and Lower Likelihood for the presence of buried archaeological resources. Higher Likelihood areas encompass gentler slopes on which unconsolidated sediments have been able to accumulate and form deep soils. Archaeological resources in these areas are more likely to become buried by sediments washed in by water (alluvium) or transported downslope from adjacent uplands (colluvium).

Because overall site cleanup involves ground-disturbing activities, there is the potential for such activities to disturb unknown potentially significant resources qualifying as historical resources or unique archaeological resources under CEQA. As described, some areas within the project site are more likely to contain buried unknown resources; however, there is potential for such resources to be uncovered at any location within the project site. Ground-disturbing activities associated with the overall site cleanup would have the potential to cause substantial adverse changes to unknown archaeological resources qualifying as historical resources or unique archaeological resources, either individually, or that may be significant as a contributor to the District. Any demolition, destruction, or alteration of such resources during or after the discovery

process could result in significant impacts. Mitigation Measures CUL-1 (Cultural Resources Personnel Professional Qualifications Standard), CUL-2 (Preparation of a Cultural Resources Management Plan [CRMP]), CUL-3 (Worker Cultural Resources Sensitivity Program), CUL-4 (Avoidance and Preservation in Place), CUL-5 (Archaeological and Native American Monitoring), CUL-6 (Inadvertent Discovery of Potential Historical Resources and Unique Archaeological Resources), CUL-7 (Curation of Project Materials), CUL-8 (Annual Site Condition Verification), CUL-9 (Comprehensive District Study and National Register Nomination), and CUL-10 (Burro Flats Complex Documentation and National Register Nomination) would avoid, minimize, reduce, or compensate for potential impacts to historical resources in the event of inadvertent discovery. Avoidance of impacts to unknown archaeological resources encountered during construction is often not feasible as resources are in most instances irreversibly impacted as a result of construction activities during the discovery process. Data recovery as mitigation for historical resources that are eligible for the CRHR under Criterion 4 in that they derive their significance from their scientific value or data potential, may effectively mitigate impacts to a less-than-significant level. However, as discussed earlier in the analysis for the overall site cleanup, these measures may not mitigate impacts to a less-than-significant level, particularly if a resource is found to be individually eligible for the CRHR under Criteria 1 (Associated with Important Events), 2 (Associated with Important Persons), or 3 (Distinctive Characteristics) or as a contributor to the District.

> Conclusion: Mitigation Measures CUL-1through CUL-10 provide for protection, planning, preservation, documentation, and data recovery and would avoid, minimize, reduce, or compensate for potential direct and indirect impacts of the overall site cleanup on archaeological resources qualifying as historical resources or unique archaeological resources. However, these measures would not mitigate impacts to a point where no significant effect on the environment would occur. Therefore, impacts of the overall site cleanup to archaeological resources qualifying as historical resources or unique archaeological resources would be significant and unavoidable at the program level.

Impact 4.4-1a Determination: *With implementation of Mitigation Measures CUL-1 through CUL-10, impacts to archaeological resources qualifying as historical resources or unique archaeological resources from the* ***overall site cleanup*** *would be* ***significant and unavoidable.***

Initial Project Assessment

Impact 4.4-1b: Would implementation of the **initial activities** could cause a substantial adverse change in the significance of archaeological resources qualifying as historical resources or unique archaeological resources as defined in CEQA Guidelines Section 15064.5?

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement up to eight projects as soon as possible after approval by DTSC. This following discussions address impacts related to those activities:

DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal (Impact 4.4-1b)

DOE's initial project proposes to excavate and remediate up to 392,000 CY of soil from Area IV. Four archaeological sites (CA-VEN-1302, -1412, -1420, and -1775) are known to overlap with the areas proposed for excavation under DOE's initial project and may be impacted. Three of these sites (CA-VEN-1302, -1412, and -1775) have been evaluated and recommended individually eligible for listing in the NRHP and are considered historical resources under CEQA. One site (CA-VEN-1420) has been evaluated and recommended as not individually eligible for listing in the NRHP and is not considered a historical resource or unique archaeological resource. Direct impacts from DOE's initial project to the three known individually eligible archaeological sites (CA-VEN-1302, -1412, -and -1775) could result in a substantial adverse change in the significance of these historical resources through demolition or alteration of those physical characteristics of the historical resources that convey their historical significance and qualify them for individual listing in the CRHR. Implementation of Mitigation Measures CUL-1 (Cultural Resources Personnel Professional Qualifications Standard), CUL-2 (Preparation of a CRMP), CUL-3 (Worker Cultural Resources Sensitivity Program), CUL-4 (Avoidance and Preservation in Place), CUL-5 (Archaeological and Native American Monitoring), CUL-7 (Curation of Project Materials), and CUL-8 (Annual Site Condition Verification) would avoid, minimize, or reduce impacts to the three known individually eligible archaeological resources to a less-than-significant level.

As previously described, all of the 132 prehistoric sites and the prehistoric components of the six multicomponent archaeological sites identified to date within the project site are contributors to the significance of the District. DOE's initial project would remove large amounts of soil that may result in direct impacts to four known archaeological sites (CA-VEN-1302, -1412, -1420, and -1775), each of which are considered contributors to the District. Impacts to known District contributors could result in a substantial adverse change in the significance of the District as a historical resource through demolition or alteration of those physical characteristics of the District that convey its historical significance and qualify it for inclusion in the CRHR. Furthermore, large amounts of soil disturbance would indirectly impact the District through alteration of the historical setting of the District and its contributors. Indirect impacts could also result from disturbances to contributors caused by erosion or by an increased number of vehicles and personnel at the site, which could expose or damage contributors. For the reasons described previously in the analysis for the overall site cleanup, DOE's initial project could cause a substantial adverse change in the significance of the District. Implementation of Mitigation Measures CUL-1 (Cultural Resources Personnel Professional Qualifications Standard), CUL-2 (Preparation of a Cultural Resources Management Plan [CRMP]), CUL-3 (Worker Cultural Resources Sensitivity Program), CUL-4 (Avoidance and Preservation in Place), CUL-5 (Archaeological and Native American Monitoring), CUL-7 (Curation of Project Materials), CUL-8 (Annual Condition Verification), and CUL-9 (Comprehensive District Study and National Register Nomination) would avoid, minimize, reduce, or compensate for the impact of DOE's initial project on the District; however, because impacts to District contributors would result in damage to the integrity of the District and a loss of data to adequately inform relevant regional

research themes as described earlier in this section, the impacts to the District resulting from DOE's initial project would not be mitigated to a less-than-significant level.

Potential project impacts to unknown archaeological resources qualifying as historical resources or unique archaeological resources from DOE's initial project would be similar to those previously described for the overall site cleanup. Ground-disturbing activities associated with DOE's initial project would have the potential to cause substantial adverse changes to unknown archaeological resources that may be individually eligible or eligible as contributors to the District. Implementation of Mitigation Measures CUL-1 (Cultural Resources Personnel Professional Qualifications Standard), CUL-2 (Preparation of a Cultural Resources Management Plan [CRMP]), CUL-3 (Worker Cultural Resources Sensitivity Program), CUL-4 (Avoidance and Preservation in Place), CUL-5 (Archaeological and Native American Monitoring), CUL-6 (Inadvertent Discovery of Potential Historical Resources and Unique Archaeological Resources), CUL-7 (Curation of Project Materials), CUL-8 (Annual Condition Verification), and CUL-9 (Comprehensive District Study and National Register Nomination) would avoid, minimize, reduce, or compensate for potential impacts to historical resources in the event of inadvertent discovery. Avoidance of impacts to unknown archaeological resources encountered during construction is often not feasible as resources are in most instances irreversibly impacted as a result of construction activities during the discovery process. Data recovery as mitigation for historical resources that are eligible for the CRHR under Criterion 4 in that they derive their significance from their scientific value or data potential, may effectively mitigate impacts to a less-than-significant level. However, as discussed earlier in the analysis for the overall site cleanup, these measures may not mitigate impacts to a less-than-significant level, particularly if a resource is found to be individually eligible for the CRHR under Criteria 1 (Associated with Important Events), 2 (Associated with Important Persons), or 3 (Distinctive Characteristics) or as a contributor to the District.

> Conclusion: Mitigation Measures CUL-1 through CUL-9 provide for protection, planning, preservation, documentation, and data recovery and would avoid, minimize, reduce, or compensate for potential direct and indirect impacts of DOE's initial project on archaeological resources qualifying as historical resources or unique archaeological resources. However, these measures would not mitigate impacts to a point where no significant effect on the environment would occur. Therefore, impacts of DOE's initial project to archaeological resources qualifying as historical resources or unique archaeological resources would be significant and unavoidable.

NASA Liquid Oxygen Plant (Impact 4.4-1b)

NASA's Liquid Oxygen Plant project proposes to excavate up to 73,533 CY of soil for offsite disposal. This initial project does not overlap with any known individual archaeological resources or District contributors and therefore would not result in direct impacts to known archaeological resources or District contributors qualifying as historical resources or unique archaeological resources. However, NASA's initial project would remove soil in areas of the project site located in the vicinity of known archaeological sites that could be individually eligible and that are considered contributors to the District. Large amounts of soil disturbance could indirectly impact

the District through alteration of the historical setting of its contributors. Indirect impacts could also result from disturbances to resources caused by erosion or by an increased number of vehicles and personnel at the site, which could expose or damage archaeological resources. For the reasons described previously in the analysis for the overall site cleanup, NASA's initial project would cause a substantial adverse change in the significance of the District as a historical resource through demolition or alteration of the historical setting of the District that is important in conveying the District's historical significance. Implementation of Mitigation Measures CUL-1 (Cultural Resources Personnel Professional Qualifications Standard), CUL-2 (Preparation of a Cultural Resources Management Plan [CRMP]), CUL-3 (Worker Cultural Resources Sensitivity Program), CUL-4 (Avoidance and Preservation in Place), CUL-5 (Archaeological and Native American Monitoring), CUL-7 (Curation of Project Materials) and CUL-8 (Annual Site Condition Verification) would avoid, minimize, or reduce for the indirect impact of NASA's initial project on the District, but would not mitigate indirect impacts to a less-than-significant level.

Potential project impacts to unknown archaeological resources qualifying as historical resources or unique archaeological resources from NASA's initial project would be similar to those previously described for the overall site cleanup. Ground-disturbing activities associated with this initial project would have the potential to cause substantial adverse changes to unknown significant archaeological resources that may be individually eligible or eligible as contributors to the District. Implementation of Mitigation Measures CUL-1 (Cultural Resources Personnel Professional Qualifications Standard), CUL-2 (Preparation of a Cultural Resources Management Plan [CRMP]), CUL-3 (Worker Cultural Resources Sensitivity Program), CUL-4 (Avoidance and Preservation in Place), CUL-5 (Archaeological and Native American Monitoring), CUL-6 (Inadvertent Discovery of Potential Historical Resources and Unique Archaeological Resources), CUL-7 (Curation of Project Materials), CUL-8 (Annual Condition Verification), CUL-9 (Comprehensive District Study and National Register Nomination), and CUL-10 (Burro Flats Complex Documentation and National Register Nomination) would avoid, minimize, reduce, or compensate for potential impacts to historical resources in the event of inadvertent discovery. Avoidance of impacts to unknown archaeological resources encountered during construction is often not feasible as resources are in most instances irreversibly impacted as a result of construction activities during the discovery process. Data recovery as mitigation for historical resources that are eligible for the CRHR under Criterion 4 in that they derive their significance from their scientific value or data potential, may effectively mitigate impacts to a less-than-significant level. However, as discussed earlier in the analysis for the overall site cleanup, these measures may not mitigate impacts to a less-than-significant level, particularly if a resource is found to be individually eligible for the CRHR under Criteria 1 (Associated with Important Events), 2 (Associated with Important Persons), or 3 (Distinctive Characteristics) or as a contributor to the District.

> Conclusion: Mitigation Measures CUL-1 through CUL-10 provide for protection, planning, preservation, documentation, and data recovery and would avoid, minimize, reduce, or compensate for potential direct and indirect impacts of NASA's initial project on archaeological resources qualifying as historical resources or unique archaeological

resources. However, these measures would not mitigate impacts to a point where no significant effect on the environment would occur. Therefore, impacts of NASA's initial project to archaeological resources qualifying as historical resources or unique archaeological resources would be significant and unavoidable.

DOE Building Demolition Activities (Impact 4.4-1b)

DOE demolition activities would involve the removal of aboveground facilities, floor slabs, subsurface vaults, and foundations and subsurface excavation to depths up to 40 feet which could involve the removal of soils not previously disturbed. No known individual archaeological resources or District contributors overlap with this project; ergo, known individual archaeological resources or District contributors would not be directly or indirectly impacted by soil removal associated with DOE building demolition activities.

Potential impacts resulting from demolition activities to unknown archaeological resources that qualify as historical resources or unique archaeological resources would be similar to those previously described for the overall site cleanup. Ground-disturbing activities of any previously undisturbed soils associated with the demolition activities would have the potential to cause substantial adverse changes to unknown archaeological resources that may be individually eligible or eligible as contributors to the District. Implementation of Mitigation Measures CUL-1 (Cultural Resources Personnel Professional Qualifications Standard), CUL-2 (Preparation of a Cultural Resources Management Plan [CRMP]), CUL-3 (Worker Cultural Resources Sensitivity Program), CUL-4 (Avoidance and Preservation in Place), CUL-5 (Archaeological and Native American Monitoring), CUL-6 (Inadvertent Discovery of Potential Historical Resources and Unique Archaeological Resources), CUL-7 (Curation of Project Materials), CUL-8 (Annual Site Condition Verification), and CUL-9 (Comprehensive District Study and National Register Nomination) would avoid, minimize, reduce, or compensate for potential impacts to historical resources in the event of inadvertent discovery. Avoidance of impacts to unknown archaeological resources encountered during construction is often not feasible as resources are in most instances irreversibly impacted as a result of construction activities during the discovery process. Data recovery as mitigation for historical resources that are eligible for the CRHR under Criterion 4 in that they derive their significance from their scientific value or data potential, may effectively mitigate impacts to a less-than-significant level. However, as discussed earlier in the analysis for the overall site cleanup, these measures may not mitigate impacts to a less-than-significant level, particularly if a resource is found to be individually eligible for the CRHR under Criteria 1 (Associated with Important Events), 2 (Associated with Important Persons), or 3 (Distinctive Characteristics) or as a contributor to the District.

Conclusion: Mitigation Measures CUL-1 through CUL-9 provide for protection, planning, preservation, documentation, and data recovery and would avoid, minimize, reduce, or compensate for potential direct and indirect impacts of DOE building demolition activities on archaeological resources qualifying as historical resources or unique archaeological resources. However, these measures would not mitigate impacts to a point where no significant effect on the environment would occur. Therefore, impacts

of DOE building demolition activities to archaeological resources qualifying as historical resources or unique archaeological resources would be significant and unavoidable.

RCRA Post-Closure and Hazardous Waste Facility Closure (Impact 4.4-1b)

This discussion addresses the five closure projects described in Section 3.7.4, *RCRA Post-Closure and Hazardous Waste Facility Closure*:

- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

Thermal Treatment Facility Closure (Impact 4.4-1b)

The TTF closure project located in Area I (Boeing) would include additional sampling, excavation, and disposal of about 300 CY of in situ soil and concrete debris at an offsite RCRA permitted disposal facility, followed by confirmation sampling and restoration. Although limited, these activities could incidentally involve the removal and disruption of soils not previously disturbed.

No known individual archaeological resources or District contributors would be directly or indirectly impacted by soil removal for the TTF closure.

Potential TTF closure impacts to unknown archaeological resources that qualify as historical resources or unique archaeological resources would be similar to those previously described for the overall site cleanup. Ground-disturbing activities of any previously undisturbed soils associated with TTF closure would have the potential to cause substantial adverse changes to unknown significant archaeological resources that may be individually eligible or eligible as contributors to the District. Implementation of Mitigation Measures CUL-1 (Cultural Resources Personnel Professional Qualifications Standard), CUL-2 (Preparation of a Cultural Resources Management Plan [CRMP]), CUL-3 (Worker Cultural Resources Sensitivity Program), CUL-4 (Avoidance and Preservation in Place), CUL-5 (Archaeological and Native American Monitoring), CUL-6 (Inadvertent Discovery of Potential Historical Resources and Unique Archaeological Resources), CUL-7 (Curation of Project Materials), CUL-8 (Annual Site Condition Verification), and CUL-9 (Comprehensive District Study and National Register Nomination) would avoid, minimize, reduce, or compensate for potential impacts to historical resources in the event of inadvertent discovery. Avoidance of impacts to unknown archaeological resources encountered during construction is often not feasible as resources are in most instances irreversibly impacted as a result of construction activities during the discovery process. Data recovery as mitigation for historical resources that are eligible for the CRHR under Criterion 4 in that they derive their significance from their scientific value or data potential, may effectively mitigate impacts to a less-than-significant level. However, as discussed earlier in the analysis for the overall site cleanup, these measures may not mitigate impacts to a less-than-significant level, particularly if a resource is found to be individually eligible for the CRHR under Criteria 1

(Associated with Important Events), 2 (Associated with Important Persons), or 3 (Distinctive Characteristics) or as a contributor to the District.

> Conclusion: Mitigation Measures CUL-1 through CUL-9 provide for protection, planning, preservation, documentation, and data recovery and would avoid, minimize, reduce, or compensate for potential direct and indirect impacts of TTF closure on archaeological resources qualifying as historical resources or unique archaeological resources. However, these measures would not mitigate impacts to a point where no significant effect on the environment would occur. Therefore, impacts of TTF closure to archaeological resources qualifying as historical resources or unique archaeological resources would be significant and unavoidable.

Radioactive Materials Handling Facility Closure and Hazardous Waste Management Facility Closure (Impact 4.4-1b)

Closure activities for these projects would be largely limited to decontamination and demolition of the physical facilities and characterization of all building debris with remediation of soil beneath and surrounding the buildings as part of a subsequent and separate phase under the AOC. Although limited, these activities could incidentally involve the removal and disruption of soils not previously disturbed.

No known individual archaeological resources or District contributors would be directly or indirectly impacted by RMHF and HWMF closure.

Potential RMHF and HWMF closure impacts to unknown archaeological resources that qualify as historical resources or unique archaeological resources would be similar to those previously described for the overall site cleanup. Ground-disturbing activities of any previously undisturbed soils associated with RMHF and HWMF closure would have the potential to cause substantial adverse changes to unknown significant archaeological resources that may be individually eligible or eligible as contributors to the District. Implementation of Mitigation Measures CUL-1 (Cultural Resources Personnel Professional Qualifications Standard), CUL-2 (Preparation of a Cultural Resources Management Plan [CRMP]), CUL-3 (Worker Cultural Resources Sensitivity Program), CUL-4 (Avoidance and Preservation in Place), CUL-5 (Archaeological and Native American Monitoring), CUL-6 (Inadvertent Discovery of Potential Historical Resources and Unique Archaeological Resources), CUL-7 (Curation of Project Materials), CUL-8 (Annual Site Condition Verification), and CUL-9 (Comprehensive District Study and National Register Nomination) would avoid, minimize, reduce, or compensate for potential impacts to historical resources in the event of inadvertent discovery. Avoidance of impacts to unknown archaeological resources encountered during construction is often not feasible as resources are in most instances irreversibly impacted as a result of construction activities during the discovery process. Data recovery as mitigation for historical resources that are eligible for the CRHR under Criterion 4 in that they derive their significance from their scientific value or data potential, may effectively mitigate impacts to a less-than-significant level. However, as discussed earlier in the analysis for the overall site cleanup, these measures may not mitigate impacts to a less-than-significant level, particularly if a resource is found to be individually eligible for the CRHR under Criteria 1

(Associated with Important Events), 2 (Associated with Important Persons), or 3 (Distinctive Characteristics) or as a contributor to the District.

Conclusion: Mitigation Measures CUL-1 through CUL-9 provide for protection, planning, preservation, documentation, and data recovery and would avoid, minimize, reduce, or compensate for potential direct and indirect impacts of RMHF and HWMF closure on archaeological resources qualifying as historical resources or unique archaeological resources. However, these measures would not mitigate impacts to a point where no significant effect on the environment would occur. Therefore, impacts of RMHF and HWMF closure to archaeological resources qualifying as historical resources or unique archaeological resources would be significant and unavoidable.

Areas I, II, and III Impoundment Post-Closure (Impact 4.4-1b)

The proposed activities associated with the impoundment permit renewals are limited to managing impoundments through monitoring and periodic maintenance. The primary maintenance activities would include ongoing maintenance of the surface impoundment caps, surface water diversion features, and maintenance of the monitoring well network used to evaluate ongoing groundwater conditions.

One archaeological site, CA-VEN-1471, overlaps with two impoundments subject to post-closure. However, because no new ground-disturbing activities are proposed, the site would not be directly impacted. Mitigation Measures CUL-1 (Cultural Resources Personnel Professional Qualifications Standard), CUL-2 (Preparation of a Cultural Resources Management Plan [CRMP]), CUL-3 (Worker Resources Sensitivity Program), CUL-4 (Avoidance and Preservation in Place), CUL-5 (Archaeological and Native American Monitoring), CUL-7 (Curation of Project Materials), and CUL-8 (Annual Site Condition Verification) would ensure that CA-VEN-1471 is not impacted by this initial project and the impact would be reduced to a less-than-significant level.

The District contributors would likewise not be significantly impacted by the initial activities, because no contributors to the District would be impacted. Since these actions do not involve removal of soil, there would be no impact to unknown archaeological resources.

> Conclusion: This action would result in a less-than-significant impact to archaeological resources qualifying as historical resources or unique archaeological resources with implementation of Mitigation Measures CUL-1 through CUL-5, CUL-7, and CUL-8.

Impact 4.4-1b Determination: *With implementation of Mitigation Measures CUL-1 through CUL-10, impacts to archaeological resources qualifying as historical resources and unique archaeological resources from the* ***initial activities*** *would be* ***significant and unavoidable****.*

4.4.5.2 Native American Resources (SSFL TCP)

Program Assessment

Impact 4.4-2a: Would implementation of the **overall site cleanup** cause a substantial adverse change in the significance of a tribal cultural resource as a result of the physical destruction and alteration to the characteristics of the property that convey its significance and qualify it for inclusion in the CRHR as defined in CEQA Guidelines Section 21074?

Overall Site Cleanup (Impact 4.4-2a)

The project site is located within, and is encompassed by, a TCP (SSFL TCP) of traditional religious and cultural significance to several local tribes. As a result of Section 106 consultation, NASA determined that the SSFL TCP was eligible for inclusion in the NRHP under Criteria A and D (NASA et al., 2014).[1] Because the TCP has been determined eligible for inclusion in the NRHP, it is automatically listed in the CRHR (PRC Section 5024.1(d)(1)) and is considered a tribal cultural resource per CEQA Guidelines Section 21074(a)(1)(A).

Physical characteristics ("contributing elements") of the SSFL TCP that appear to convey its significance include prehistoric and multicomponent archaeological sites and isolates[2], prehistoric rock art, topographic features (including mountain peaks and rock outcroppings), plants (particularly indigenous plants of traditional cultural significance), and animals (Armenta, 2013; Armenta, 2014; NAHC, 2013).

Impacts to contributing elements would result in a significant impact to the tribal cultural resource identified as the SSFL TCP. Although some boulders might be temporarily relocated to access contaminated soils beneath them, based on the distribution of contaminants, topographic features, such as rock outcroppings and mountain peaks, are unlikely to be disturbed or otherwise impacted by the overall site cleanup. Impacts to each of the other contributing elements are considered as follows.

Prehistoric and Multicomponent Archaeological Resources and Isolates

Some local tribes value prehistoric archaeological resources as an integral part of the SSFL TCP. All archaeological sites and isolates within the project site that contain a prehistoric component are considered contributing elements to the SSFL TCP.[3] Any damage, destruction, or alteration to such an archaeological resource would negatively affect the SSFL TCP.

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1 The geographic area of the TCP determined eligible for the NRHP by NASA was limited to NASA administered Areas I and II.

2 Although isolates are not considered eligible for individual listing in the CRHR or as contributors to the District and do not qualify as unique archaeological resources, isolates are an important Native American resource and are considered contributors to the SSFL TCP.

3 Prehistoric archaeological resources and isolates are considered contributors to the SSFL TCP regardless of their individual eligibility for listing in the CRHR or their eligibility as contributors to the District and regardless of whether they qualify as unique or non-unique archaeological resources.

The District, as a prehistoric archaeological resource that includes the individual prehistoric and multicomponent sites already identified as contributors to the SSFL TCP, is also considered a contributing element to the SSFL TCP. As discussed earlier for Impact 4.4-1a, the District would also sustain a significant and unavoidable impact as a result of the overall site cleanup.

Prehistoric Rock Art

Twenty-three archaeological sites within the project site contain rock art. Because of the distribution of contaminants, rock art, typically associated with bedrock outcroppings, is unlikely to be directly impacted by overall site cleanup. However, rock art is integrally tied to the surrounding setting and could sustain significant indirect impacts resulting from large-scale excavation, which could affect the feeling and association of rock art to the SSFL TCP.

Plants and Animals

Inventories of native plant and animal species have indicated that there are a large number of plant species located within the project site that are traditionally important to Native American communities. As discussed in Section 4.3, *Biological Resources*, of this PEIR, the project would involve extensive excavation and vegetation removal, and would destroy many acres of natural habitat, including aquatic/riparian habitats, coast live oak woodland habitats, Venturan coastal sage scrub, and vegetated rock outcrops. This loss of natural habitat would impact vegetation and wildlife that are integrally tied to the importance of the SSFL TCP and its natural setting.

The excavation and remediation of over 2 million cubic yards of soil would directly impact contributing elements of the SSFL TCP through the alteration or destruction of prehistoric archaeological sites and isolates, alteration of the natural landscape surrounding important archaeological resources and rock art sites, and the alteration of natural habitat affecting plant and animal communities associated with the SSFL TCP and would constitute a profound impact to some Native American tribes whose culture, history, and identity is significantly tied to the area. Furthermore, the overall natural setting, feeling, and associations of the SSFL TCP would be significantly modified thus altering the interrelationships of contributing elements to one another. Although excavated areas would be partially backfilled, graded to allow for natural surface water drainage, and re-vegetated, only up to one-third of the excavation volumes in Area I, Area II, Area III, and Southern Undeveloped Area, and up to three-quarters of the excavation volumes in Area IV and the Northern Undeveloped Area would be backfilled; thus, the relationship of natural topography, native habitat, and other contributors within the SSFL TCP would not be returned to its pre-project condition and the appearance of the SSFL TCP would be permanently altered.

Because the overall site cleanup would cause direct and indirect impacts to the SSFL TCP, the overall site cleanup would result in a substantial adverse change in the significance of a tribal cultural resource. The SSFL TCP is a nonrenewable resource and possesses significant intrinsic value to local Native American groups. The overall site cleanup would result in the destruction and alteration of contributing elements of the SSFL TCP, which would result in a substantial adverse change to this tribal cultural resource and which would significantly alter the ability of the resource to convey its significance. Implementation of Mitigation Measures CUL-11 (Native American Document Review and Comment), CUL-12 (Native American Access), CUL-13

(Native American Communication), CUL-14 (Comprehensive Ethnographic Study), CUL-15 (Rock Art Recordation and Interpretation), and CUL-16 (Research Grant for Future Cultural Resources Studies), in conjunction with CUL-1 through CUL-10 as well as Mitigation Measures BIO-2 (Worker Environmental Awareness Training), BIO-5 (Revegetation Plan), BIO-12 (Wildlife Monitoring), and BIO-19 (Sensitive Habitats) would avoid, minimize, rectify, reduce, or compensate for the impact of the overall site cleanup. Mitigation Measure CUL-11 outlines procedures for Interested Tribes to be afforded the opportunity to review cultural-resources-related documentation and provide comment and input. Mitigation Measure CUL-12 outlines procedures for Interested Tribes to access the site. Mitigation Measure CUL-13 outlines communication procedures with Interested Tribes to continue their involvement through project implementation. Mitigation Measure CUL-14 requires that a Comprehensive Ethnographic Study be prepared that considers the Tribal perspective of the SSFL TCP in its larger local and regional context and that captures the intrinsic value of the SSFL TCP to Tribes such that this resource is preserved in posterity through documentation. Mitigation Measure CUL-15 requires that rock art sites be documented and studied using state-of-the-art technologies to capture the condition of the sites in the larger context of the SSFL TCP prior to any physical impacts occurring such that the context and setting of the rock art is preserved in posterity. Mitigation Measure CUL-16 requires that grant funding be provided for students to use the data gathered as a result of overall site cleanup to complete studies that preserve and advance the understanding of Tribal, cultural, and archaeological resources associated with the SSFL TCP. Mitigation Measure BIO-2 (Worker Environmental Awareness Program) requires sensitivity training for project personnel. Mitigation Measure BIO-5 (Revegetation Plan) requires restoration of impacted native vegetation communities. Mitigation Measure BIO-12 (Wildlife Monitoring) requires monitoring of wildlife. Mitigation Measure BIO-19 (Sensitive Habitats) requires mitigation for impacts to sensitive habitats, including oak woodlands. Although these measures would avoid, minimize, rectify, reduce, or compensate for the impact of the overall site cleanup, they would not mitigate the impact to the SSFL TCP to a less-than-significant level.

> Conclusion: The overall site cleanup would result in the destruction or alteration of contributing elements which convey the significance of the SSFL TCP. The SSFL TCP is a non- renewable resource and possesses significant intrinsic value to local Native American groups. Although the implementation of Mitigation Measures CUL-1 through CUL-16 as well as BIO-2, BIO-5, BIO-12 and BIO-19 would avoid, minimize, rectify, reduce, or compensate for impacts to the SSFL TCP, they would not be mitigated to a less-than-significant level. Therefore, impacts to the tribal cultural resource identified as the SSFL TCP would be significant and unavoidable.

Impact 4.4-2a Determination: *With implementation of Mitigation Measures CUL-1 through CUL-16, BIO-2, BIO-5, BIO-12, and BIO-19, impacts to tribal cultural resources from the* ***overall site cleanup*** *would be* ***significant and unavoidable.***

Initial Project Assessment

Impact 4.4-2b: Would implementation of the **initial activities** cause a substantial adverse change in the significance of tribal cultural resources as a result of the physical destruction and alteration to the characteristics of the property that convey its significance and qualify it for inclusion in the CRHR as defined in CEQA Guidelines Section 21074?

The RPs have identified initial projects that are ready to be implemented. The impacts of those initial activities are evaluated at the project-level below and in the following pages.

DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal (Impact 4.4-2b)

DOE's initial project proposes to excavate and remediate up to 392,000 CY of soil from Area IV. Potential project impacts to the SSFL TCP from DOE's initial project would be similar to those previously described for the overall site cleanup. Four known archaeological sites (CA-VEN-1302, -1412, -1420, and -1775), all of which are contributors to the SSFL TCP, overlap with the areas proposed for excavation under DOE's initial project and could be directly impacted. In addition, isolates may be disturbed, and unknown archaeological resources could be inadvertently encountered during ground disturbance and thereby directly impacted by the project. No known rock art would be directly impacted by DOE's initial project. The excavation of 392,000 CY of soil remove or otherwise disturb habitat and thus plants and animals (identified as contributors the SSFL TCP) associated with approximately 23 acres of habitat including chaparral, Venturan coastal sage scrub, mulefat scrub, coast live oak riparian forest, coast live oak woodland, California walnut woodland, nonnative grassland, and rock outcrop habitats, significantly altering the historical setting and interrelationships of contributors to the SSFL TCP. Implementation of Mitigation Measures CUL-1 through CUL-9, CUL-11 through CUL-16, as well as BIO-2, BIO-5, BIO-12, and BIO-19 would avoid, minimize, rectify, reduce, or compensate for impacts to the SSFL TCP; however, they would not be mitigated to a less-than-significant level.

> Conclusion: DOE's initial project would result in the destruction or alteration of contributing elements that convey the significance of the SSFL TCP. The SSFL TCP is a non- renewable resource and possesses significant intrinsic value to local Native American groups. Although the implementation of Mitigation Measures CUL-1 through CUL-9, CUL-11 through CUL-16, as well as BIO-2, BIO-5, BIO-12, and BIO-19 would avoid, minimize, rectify, reduce, or compensate for impacts to the SSFL TCP, they would not be mitigated to a less-than-significant level. Therefore, impacts to the tribal cultural resource identified as the SSFL TCP would be significant and unavoidable.

NASA Liquid Oxygen Plant (Impact 4.4-2b)

NASA's Liquid Oxygen Plant project proposes to excavate up to 73,533 CY of soil for offsite disposal. Potential project impacts to the SSFL TCP from NASA's initial project would be similar to those previously described for the overall site cleanup. While no known archaeological sites would be directly impacted by this initial project, isolates could be disturbed and unknown archaeological resources could be inadvertently impacted during project implementation. No

known rock art would be directly impacted by NASA's initial project. The excavation of 73,533 CY of soil would remove or otherwise disturb habitat and thus plants and animals (identified as contributors to the SSFL TCP) associated with approximately 14 acres of habitat including aquatic (riverine), coast live oak woodland, nonnative grassland, rock outcrop, coast live oak woodland (riparian), mulefat scrub, southern willow scrub, chaparral, and undifferentiated exotic vegetation, thus significantly altering the historical setting and interrelationships of contributors of the SSFL TCP. Implementation of Mitigation Measures CUL-1 through CUL-16 as well as BIO-2, BIO-5, BIO-12, and BIO-19 would avoid, minimize, rectify, reduce, or compensate for impacts to the SSFL TCP; however, they would not be mitigated to a less-than-significant level.

> Conclusion: NASA's initial project would result in the destruction or alteration of contributing elements that convey the significance of the SSFL TCP. The SSFL TCP is a non- renewable resource and possesses significant intrinsic value to local Native American groups. Although the implementation of Mitigation Measures CUL-1 through CUL-16 as well as BIO-2, BIO-5, BIO-12, and BIO-19 would avoid, minimize, rectify, reduce, or compensate for impacts to the SSFL TCP, they would not be mitigated to a less-than-significant level. Therefore, impacts to the tribal cultural resource identified as the SSFL TCP would be significant and unavoidable.

DOE Building Demolition Activities (Impact 4.4-2b)

DOE demolition activities would involve the removal of aboveground facilities, floor slabs, subsurface vaults, and foundations and subsurface excavation to depths up to 40 feet. Although limited, these activities could incidentally involve the removal and disruption of soils not previously disturbed. Potential project impacts to the SSFL TCP from this initial project would be similar to those previously described for the overall site cleanup. While no known archaeological resources, rock art, or natural habitat would be directly impacted by this initial project, unknown archaeological resources could be inadvertently disturbed and thereby directly impacted during project implementation. Direct impacts to unknown archaeological sites that may be altered or destroyed as a result of impacts to previously undisturbed soils associated with this project would constitute a significant impact to the SSFL TCP. Implementation of Mitigation Measures CUL-1 through CUL-9 and CUL-11 through CUL-16 would avoid, minimize, rectify, reduce, or compensate for impacts to the SSFL TCP, but because unknown archaeological resources may be irreversibly impacted during any discoveries associated with the project, mitigation measures would not reduce impacts to a less-than-significant level.

> Conclusion: The DOE Building Demolition Activities could result in the destruction or alteration of contributing elements that convey the significance of the SSFL TCP. The SSFL TCP is a non- renewable resource and possesses significant intrinsic value to local Native American groups. Although the implementation of Mitigation Measures CUL-1 through CUL-9 and CUL-11 through CUL-17 would avoid, minimize, rectify, reduce, or compensate for impacts to the SSFL TCP, they would not be mitigated to a less-than-significant level. Therefore, impacts to the tribal cultural resource identified as the SSFL TCP would be significant and unavoidable.

RCRA Post-Closure and Hazardous Waste Facility Closure (Impact 4.4-2b)

This discussion addresses the five closure projects described in Section 3.7.4, *RCRA Post-Closure and Hazardous Waste Facility Closure*:

- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

Thermal Treatment Facility Closure (Impact 4.4-2b)

The TTF closure project located in Area I (Boeing) would include additional sampling, excavation, and disposal of about 300 CY of in situ soil and concrete debris at an offsite RCRA permitted disposal facility, followed by confirmation sampling and restoration. Although limited, these activities could incidentally involve the removal and disruption of soils not previously disturbed.

While no known archaeological resources, rock art, or natural habitat would be directly impacted by this initial project, unknown archaeological resources could be inadvertently disturbed and thereby directly impacted during project implementation. Direct impacts to unknown archaeological sites that may be altered or destroyed as a result of impacts to previously undisturbed soils associated with this project would constitute a significant impact to the SSFL TCP. Implementation of Mitigation Measures CUL-1 through CUL-9 and CUL-11 through CUL-16 would avoid, minimize, rectify, reduce, or compensate for impacts to the SSFL TCP, but because unknown archaeological resources may be irreversibly impacted during any discoveries associated with the project, mitigation measures would not reduce impacts to a less-than-significant level.

> Conclusion: The TTF closure could result in the destruction or alteration of the contributing elements that convey the significance of the SSFL TCP. Although the implementation of Mitigation Measures CUL-1 through CUL-9 and CUL-11 through CUL-16 would avoid, minimize, reduce, or compensate for impacts to the SSFL TCP, they would not be reduced to a less-than-significant level. Therefore, impacts to the tribal cultural resource identified as the SSFL TCP would be significant and unavoidable.

Radioactive Materials Handling Facility Closure and Hazardous Waste Management Facility Closure (Impact 4.4-2b)

Closure activities for these projects would be limited to decontamination and demolition of the physical facilities and characterization of all building debris with remediation of soil beneath and surrounding the buildings as part of a subsequent and separate phase under the AOC. Nonetheless, although limited, these activities could incidentally involve the removal and disruption of soils not previously disturbed.

While no known archaeological resources, rock art, or natural habitat would be directly impacted by this initial project, unknown archaeological resources could be inadvertently disturbed and thereby directly impacted during project implementation. Direct impacts to unknown archaeological sites that may be altered or destroyed as a result of impacts to previously undisturbed soils associated with this project would constitute a significant impact to the SSFL TCP. Implementation of Mitigation Measures CUL-1 through CUL-9 and CUL-11 through CUL-16 would avoid, minimize, rectify, reduce, or compensate for impacts to the SSFL TCP, but because unknown archaeological resources may be irreversibly impacted during any discoveries associated with the project, mitigation measures would not reduce impacts to a less-than-significant level.

> Conclusion: The RMHF and HWMF closure could result in the destruction or alteration of the contributing elements that convey the significance of the SSFL TCP. Although the implementation of Mitigation Measures CUL-1 through CUL-9 and CUL-11 through CUL-16 would avoid, minimize, reduce, or compensate for impacts to the SSFL TCP, they would not be reduced to a less-than-significant level. Therefore, impacts to the tribal cultural resource identified as the SSFL TCP would be significant and unavoidable.

Areas I, II, and III Impoundment Post-Closure (Impact 4.4-2b)

The proposed activities associated with the impoundment permit renewals are limited to managing impoundments through monitoring and periodic maintenance. The primary maintenance activities would include ongoing maintenance of the surface impoundment caps, surface water diversion features, and maintenance of the monitoring well network used to evaluate ongoing groundwater conditions.

One archaeological site, CA-VEN-1471, overlaps with two impoundments subject to permit renewals. One archaeological site, CA-VEN-1471 (which is a contributor to the SSFL TCP), overlaps with two impoundments subject to post-closure. However, because no new ground-disturbing activities are proposed, the site would not be directly impacted nor would there be potential for unknown archaeological resources to be disturbed. Rock art and natural habitat would also not be impacted. Mitigation Measures CUL-1 (Cultural Resources Personnel Professional Qualifications Standard), CUL-2 (Preparation of a Cultural Resources Management Plan [CRMP]), CUL-3 (Worker Resources Sensitivity Program), CUL-4 (Avoidance and Preservation in Place), CUL-5 (Archaeological and Native American Monitoring), CUL-7 (Curation of Project Materials, and CUL-8 (Annual Site Condition Verification) would ensure that CA-VEN-1471 is not impacted by this initial project and impacts to the SSFL TCP would be reduced to a less-than-significant level.

> Conclusion: This action would result in a less-than-significant impact to the SSFL TCP qualifying as a tribal cultural resource with implementation of Mitigation Measures CUL-1 through CUL-5, CUL-7, and CUL-8.

Impact 4.4-2b Determination: *With implementation of Mitigation Measures CUL-1 through CUL-16, along with Mitigation Measures BIO-2, BIO-5, BIO-12, and BIO-19, impacts to tribal cultural resources from the* ***initial activities*** *would be* ***significant and unavoidable****.*

4.4.5.3 Built Environment Resources

Program Assessment

Impact 4.4-3a: Would implementation of the **overall site cleanup** cause a substantial adverse change in the significance of built environment resources qualifying as historical resources as defined in CEQA Guidelines Section 15064.5?

Overall Site Cleanup (Impact 4.4-3a)

All historic-period built environment resources, including utility infrastructure within Areas I, III, and IV, have been determined not eligible for listing in the NRHP or CRHR and are therefore not considered historical resources pursuant to CEQA Guidelines Section 15064.5. Demolition, alteration, or removal of built environment resources in Areas I, III, and IV would not constitute a substantial adverse change in the significance of built environment resources that qualify as historical resources. As discussed in Section 3.3.4, future actions related to the guard shack and fire station are not subject to DTSC approval (i.e., because they are not associated with solid waste management units) and are therefore not evaluated or described in this PEIR as part of the proposed project.

As discussed in Section 3.7.3.3, *NASA Test Stands and Buildings*, demolition of historic-period built environment resources in NASA's area of responsibility is not subject to DTSC approval and is therefore not evaluated or described in this PEIR as part of the proposed project. Built environment resources in Area II are, however, addressed in the cumulative impacts section.

> Conclusion: The overall site cleanup would result in no impact to built environment resources qualifying as historical resources. No mitigation is required.

Impact 4.4-3a Determination: *The* ***overall site cleanup*** *would result in* ***no impact*** *to built environment resources that qualify as historical resources.*

Initial Project Assessment

Impact 4.4-3b: Would implementation of the **initial activities** cause a substantial adverse change in the significance of built environment resources qualifying as historical resources as defined in CEQA Guidelines Section 15064.5?

Initial Activities (Impact 4.4-3b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal

- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

DOE and NASA's initial soil excavation and disposal projects would involve the excavation and disposal of soil; waste characterization; and backfilling and restoration. No built environment resources would be demolished, altered, or removed as part of these actions and no impact would occur.

DOE currently owns 13 buildings (B4019, B4024, B4034, B4038, B4044, B4057, B4075, B4563, B4658, B4665, B4688, B4462, and B4463) and plans to remove all of them, as well as a concrete slab associated with building B4663. The 13 buildings are not eligible for listing in the NRHP or CRHR and are not are not considered historical resources pursuant to CEQA Guidelines Section 15064.5. Demolition, alteration, or removal of these 13 buildings would not constitute a substantial adverse change in the significance of built environment resources that qualify as historical resources.

TTF closure would include additional sampling and excavation and disposal of the soils and debris that were contaminated by TTF operations, followed by confirmation sampling and restoration. No built environment resources that qualify as historical resources would be would be demolished, altered, or removed as part of this action.

The RMHF consists of buildings B4021, B4022, and B4034 and sheds B4044, B4075, B4563, B4621, B4658, B4665, and B4668, as well as the remaining concrete slab associated with B4663. Facilities to be removed include buildings B4021, B4022, and B4621 and Mixed-Waste Storage Yard. Closure activities for these buildings would include decontamination and demolition of the physical facilities and characterization of all building debris.

Buildings B4021, B4022, and B4621 are not eligible for listing in the NRHP or CRHR, and are not considered historical resources pursuant to CEQA Guidelines Section 15064.5. Demolition, alteration, or removal of these buildings would not constitute a substantial adverse change in the significance of built environment resources that qualify as historical resources.

The HWMF includes two buildings (B4029 and B4133). Closure activities for these buildings would include decontamination and demolition of the physical facilities. The HWMF buildings B4029 and B4133 are not eligible for listing the NRHP or CRHR, are not considered historical resources pursuant to CEQA Guidelines Section 15064.5. Demolition, alteration, or removal of these two buildings would not constitute a substantial adverse change in the significance of built environment resources that qualify as historical resources.

The activities associated with Areas I, II, and III Impoundment Post-Closures are limited to managing impoundments through monitoring and periodic maintenance. No built environment resources would be would be demolished, altered, or removed as part of this action.

Conclusion: The initial activities would result in no impact to built environment resources qualifying as historical resources. No mitigation is required.

Impact 4.4-3b Determination: *The **initial activities** would result in **no impact** to built environment resources that qualify as historical resources.*

4.4.5.4 Paleontological Resources

Program Assessment

Impact 4.4-4a: Would implementation of the **overall site cleanup** directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Overall Site Cleanup (Impact 4.4-3a)

The overall site cleanup would involve ground-disturbing activities including but not limited to the excavation and removal over 2 million CY of soil, drilling and installation of wells, and trenching for piping. The project site is underlain by eight geological formations/units: clay and siltstone beds of the Santa Susana Formation (Tsu); Las Virgenes Sandstone Member of the Santa Susana Formation (Tsuv); Simi Conglomerate Member of the Santa Susana Formation (Tsi); lower Chatsworth Formation (Kcsh); middle Miocene detrital sediments of Lindero Canyon (Tls and Tlsc); upper Chatsworth Formation (Kcs); and Quaternary alluvium (Qa). Three of the eight geological units have high paleontological sensitivity (Tsu, Tsuv, and Tsi). One unit has moderate to high paleontological sensitivity (Kcsh). Two units have moderate paleontological sensitivity (Tls and Tlsc). One unit has low to moderate paleontological sensitivity (Kcs). One unit has low paleontological sensitivity that increases with depth (Qa).

Excavation at any depth into high, moderate to high, and moderate sensitivity units (Tsu, Tsuv, Tsi, Kcsh, Tls, and Tlsc), excavation below 3 feet in low to moderate upper Chatsworth Formation (Kcs), and excavation below 3 feet in Quaternary alluvium (Qa), has the potential to impact a unique paleontological resource or site or unique geologic feature. Mitigation Measure CUL-18 requires implementation of a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) which would reduce some long-term and indirect impacts to unique paleontological resources or unique geological features by providing qualified professionals, sensitivity training, monitoring as outlined in the PRMMP, discovery and fossil recovery in the event resources are encountered, sediment sampling, and documentation and curation for any specimens salvaged during monitoring and would reduce impacts to a less-than-significant level.

Conclusion: Excavation activities would impact a unique paleontological resource or site or unique geologic feature. Mitigation Measure CUL-17 requiring the implementation of a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) would reduce impacts to less than significant.

Impact 4.4-4a Determination: *With implementation of Mitigation Measure CUL-17, impacts to unique paleontological resources or sites and unique geologic features from the* ***overall site cleanup*** *would be* ***less than significant****.*

Initial Project Assessment

Impact 4.4-4b: Would implementation of **initial activities** could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal (Impact 4.4-4b)

DOE's initial activities would remove approximately 300,000 CY of soil within Area IV and the Northern Undeveloped Area. The majority of Area IV and the Northern Undeveloped Area is underlain by the low-to-moderate-sensitivity upper Chatsworth Formation (Kcs). The southern portion of Area IV is underlain by the clay and siltstone beds of the high-sensitivity Santa Susana Formation (Tsu). The bulk of soil remediation would occur within the upper Chatsworth Formation (Kcs); however, approximately 24 soil remediation locations would be located within the clay and siltstone beds of the Santa Susana Formation (Tsu).

Conclusion: Excavations into these formations have the potential to impact a unique paleontological resource or site or unique geologic feature; however, implementation of Mitigation Measure CUL-17 would require preparation of a PRMMP and would reduce impacts to less than significant.

NASA Liquid Oxygen Plant (Impact 4.4-4b)

NASA's initial activities would remove up to approximately 73,533 CY of soil on 41.7 acres in the northern portion of Area I, which is entirely underlain by the low-to-moderate-sensitivity upper Chatsworth Formation.

Conclusion: Excavations below 3 feet in the low-to-moderate-sensitivity upper Chatsworth Formation (Kcs) have the potential to impact a unique paleontological resource or site or unique geologic feature. Mitigation Measure CUL-17 would require preparation of a PRMMP and would reduce impacts to less than significant.

DOE Demolition Activities (Impact 4.4-4b)

DOE demolition activities would involve the removal of aboveground facilities, floor slabs, subsurface vaults, and foundations and subsurface excavation to depths up to 40 feet. These activities would occur in Area IV on the low-to-moderate-sensitivity upper Chatsworth Formation (Kcs). While demolition activities would generally not extend into undisturbed sediments, deeper

excavations (below 3 feet) required for removal of foundations may extend into the low-to-moderate-sensitivity upper Chatsworth Formation (Kcs).

> Conclusion: Deeper excavations (below 3 feet) may extend into the low-to-moderate-sensitivity upper Chatsworth Formation (Kcs) and have the potential to impact a unique paleontological resource or site or unique geologic feature. Mitigation Measure CUL-17 would require preparation of a PRMMP and would reduce impacts to less than significant.

RCRA Post-Closure and Hazardous Waste Facility Closure

Thermal Treatment Facility Closure (Impact 4.4-4b)

TTF closure would include additional sampling and excavation and disposal of the soils and debris that were contaminated by TTF operations, followed by confirmation sampling and restoration. Approximately 300 CY of soil would be removed and excavations would extend up to 10 feet below the ground surface. The sampling locations are located in a portion of Area I underlain by Quaternary alluvium.

> Conclusion: Excavations below 3 feet in Quaternary alluvium (Qa) have the potential to impact a unique paleontological resource or site or unique geologic feature. Mitigation Measure CUL-17 would require preparation of a PRMMP and would reduce impacts to less than significant.

Radioactive Materials Handling Facility Closure and Hazardous Waste Management Facility Closure (Impact 4.4-4b)

Closure activities for these projects would generally be limited to decontamination and demolition of the physical facility and characterization of all building debris. Although remediation of soil beneath and surrounding the buildings is part of a subsequent and separate phase under the AOC, previously undisturbed soils may be impacted as a result of demolition activities. These soil disturbances are not anticipated to involve removal of soil beyond surficial soils and therefore would not constitute a potential impact to paleontological resources.

> Conclusion: Because these actions do not involve removal of soil beyond surficial soils, they would result in no impact to unique paleontological resources or sites of unique geologic features.

Areas I, II, and III Impoundment Post-Closure Permit Renewals (Impact 4.4-4b)

The proposed activities associated with the impoundment permit renewals are limited to managing impoundments through monitoring and periodic maintenance. The primary maintenance activities would include ongoing maintenance of the surface impoundment caps, surface water diversion features, and maintenance of the monitoring well network used to evaluate ongoing groundwater conditions.

> Conclusion: Because this action does not involve removal of soil, it would result in no impact to unique paleontological resources or sites of unique geologic features.

Impact 4.4-4b Determination: *With implementation of Mitigation Measure CUL-17, impacts to unique paleontological resources and unique geologic features from the* ***initial activities*** *would be* ***less than significant.***

4.4.5.5 Human Remains

Program Assessment

Impact 4.4-5a: Would implementation of the **overall site cleanup** could disturb human remains, including those interred outside of formal cemeteries?

Overall Site Cleanup (Impact 4.4-5a)

Romani (1981) mentioned the possible presence of cremated human remains at the Burro Flats Site Complex; however, there is no documentation or direct evidence of such remains and these assertions appear to be based on secondhand information (see Corbett et al., 2015).

However, large habitation sites such as the Burro Flats Site Complex very often have cemeteries associated with them; therefore, there is a strong possibility that human remains have been, or still are, present within the project site.

As discussed earlier, given the length and intensity of human occupation of the area, it is possible that unknown human remains may be present within the project site. Ground-disturbing activities associated with the project could result in the inadvertent discovery of human remains, which would be a significant impact, however, implementation of Mitigation Measures CUL-1 (Cultural Resources Personnel Professional Qualifications Standard), CUL-2 (Preparation of a Cultural Resources Management Plan [CRMP]), CUL-3 (Worker Resources Sensitivity Program), CUL-4 (Avoidance and Preservation in Place), CUL-5 (Archaeological and Native American Monitoring), CUL-6 (Inadvertent Discovery of Potential Historical Resources and Unique Archaeological Resources), and CUL-18 (Human Remains) would reduce the significant impact to human remains by providing qualified professionals, preparation of a CRMP, worker sensitivity training, archaeological and Native American monitoring, stop work and avoidance and preservation procedures, and coordination to determine the appropriate disposition of the remains. These measures would reduce impacts to human remains to a less-than-significant level.

> Conclusion: Implementation of Mitigation Measures CUL-1 through CUL-6 and CUL-18 would ensure protection and appropriate treatment and would reduce impacts to human remains to less than significant.

Impact 4.4-5a Determination: *With implementation of Mitigation Measures CUL-1 through CUL-6 and CUL-18, impacts to human remains from the* ***overall site cleanup*** *would be reduced to a* ***less-than-significant*** *level.*

Initial Project Assessment

Impact 4.4-5b: Would implementation of the **initial activities** disturb human remains, including those interred outside of formal cemeteries?

Initial Activities (Impact 4.4-5b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The first six initial activities listed above (DOE Area IV Soil Removal, NASA Liquid Oxygen Plant, DOE Building Demolition, TTF, and RMHF and HWMF) would involve soil disturbances, albeit of various degrees, and could result in the inadvertent discovery of human remains, which would be a significant impact. However, implementation of Mitigation Measures CUL-1 (Cultural Resources Personnel Professional Qualifications Standard), CUL-2 (Preparation of a CRMP), CUL-3 (Worker Resources Sensitivity Program), CUL-4 (Avoidance and Preservation in Place), CUL-5 (Archaeological and Native American Monitoring), CUL-6 (Inadvertent Discovery of Potential Historical Resources and Unique Archaeological Resources), and CUL-18 (Human Remains), as described earlier, would minimize impacts to inadvertently discovered human remains by ensuring protection and appropriate treatment, which would reduce impacts to human remains to less than significant.

The remaining two initial activities described above (Area I/III and Area II Impoundments) involving facility closure and maintenance would not include soil excavation and therefore would not have the potential to disturb human remains and no impact would occur.

> Conclusion: Implementation of Mitigation Measures CUL-1 through CUL-6 and CUL-18 would ensure protection and appropriate treatment and would reduce impacts to human remains to less than significant.

Impact 4.4-5b Determination: *With implementation of Mitigation Measures CUL-1 through CUL-6 and CUL-18, impacts to human remains from the* ***initial activities*** *would be reduced to* ***less than significant****.*

4.4.6 Mitigation Measures

The following measures shall be implemented to mitigate impacts related to cultural resources:

BIO-2: Worker Environmental Awareness Program Training (see Section 4.3.6 for description).

BIO-5: Revegetation Plan (see Section 4.3.6 for description).

BIO-12: Wildlife Monitoring (see Section 4.3.6 for description).

BIO-19: Sensitive Habitats (see Section 4.3.6 for description).

CUL-1: Cultural Resources Personnel Professional Qualifications Standard. Cultural resources consulting staff shall meet, or be under the direct supervision of an individual meeting, the minimum professional qualifications standards (PQS) set forth by the Secretary of the Interior (SOI) (codified in 36 CFR Part 61; 48 FR 44739).

CUL-2: Cultural Resources Management Plan. Prior to the start of cleanup activities, an SOI-qualified archaeologist shall be retained by the RPs, and shall be subject to DTSC approval, to prepare a comprehensive Site-Wide Cultural Resources Management Plan (CRMP), which shall be submitted to DTSC for review and approval prior to the start of any ground-disturbing activities. The purpose of the CRMP is to document the actions and procedures to be followed to ensure avoidance or minimization of impacts to cultural resources consistent with CEQA Guidelines Section 15126.4(b), and to lay out a detailed program of mitigation for direct and indirect impacts on cultural resources during project implementation. The CRMP shall cover all project activities across the entire project site, and for the life of the project.

The CRMP shall include, but is not limited to, the following elements and shall be consistent with all mitigation measures contained in this document:

- A description of the roles and responsibilities of cultural resources personnel, and the reporting relationships between project construction management and the mitigation and monitoring team, including lines of communication and notification procedures.
- Contact list for project personnel and provisions for regular contact list updates.
- Specific measures to be taken to avoid impacts to significant cultural resources, such as the designation of Environmentally Sensitive Areas, consistent with Mitigation Measure CUL-4 (Avoidance and Preservation in Place).
- An archaeological and Native American monitoring plan to be employed through the life of the project, including protocols to be followed during routine monitoring and during discovery situations; roles of archaeological and Native American monitors; agency communication requirements; and reporting requirements (consistent with Mitigation Measure CUL-5 [Archaeological and Native American Monitoring]).
- High-resolution maps for use by construction personnel to identify locations where archaeological monitoring is required, based on the Santa Susana Field Laboratory Geoarchaeological Assessment (Lockwood, 2016).

- Native American participation in all cultural-resources-related actions consistent with Mitigation Measures CUL-11 through CUL-13.
- A Research Design to be used to guide the evaluation of cultural resources, including a regional cultural setting, appropriate regional research questions, and field methods for the testing and evaluation of cultural resources.
- Prescribed actions to be taken in the event that cultural resources are inadvertently discovered during construction, or known resources are impacted in an unanticipated manner, consistent with Mitigation Measure CUL-6 (Inadvertent Discovery), including, but not limited to:
  - Establishment of an Environmentally Sensitive Area, marked with exclusion fencing, with a minimum of a 100-foot radius unless a smaller buffer is agreed to among the SOI-qualified archaeologist, Interested Tribes,[4] and relevant RP, and upon DTSC approval.
  - Documentation of resource(s) on California Department of Parks and Recreation (DPR) 523 forms.
  - Inspection of the resource(s) by a qualified archaeologist.
  - Evaluation of the resource for listing in the California Register of Historical Resources (CRHR) (considering criteria 1 through 4) or as a unique archaeological resource, and as a contributor to the Simi Hills Archaeological District and/or the SSFL Traditional Cultural Property (TCP), following the research design established in the CRMP and consistent with the Simi Hills Archaeological District Study (Bray et al., 2016).
- Treatment protocols for significant cultural resources that cannot be avoided and analysis of data in a regional context, consistent with Mitigation Measures CUL-4 (Avoidance and Preservation in Place) and CUL-6 (Inadvertent Discovery) which shall include, but not be limited to:
  - A sufficient avoidance buffer, recommended by the SOI-qualified archaeologist, in coordination with the relevant RP, Interested Tribes, and with the approval of DTSC, to protect the resource until data recovery is completed;
  - Sample excavation.
  - Surface artifact collection.
  - Site documentation.
  - Special studies where sufficient data exists, as determined by the SOI-qualified archaeologist, including but not limited to radiocarbon dating, residue analysis, sourcing, and other materials analysis.
  - Historical research, with the aim to target the recovery of important scientific data contained in the portion of the significant resource to be impacted by the project.
  - Documentation, photography, and collection of oral histories.

[4] The term "Interested Tribes" as used in mitigation measures, is defined as those tribes or Native American individuals who are actively participating in the SSFL Sacred Sites Council.

- A report documenting the methods and results of the treatment of the resource shall be prepared by the SOI-qualified archaeologist, following Archaeological Resources Management Report (ARMR) guidelines, and shall be submitted to DTSC for review and approval within 90 days of the completion of treatment, and shall also be submitted to the South Central Coastal Information Center (SCCIC).
- Procedures for the appropriate treatment of human remains, consistent with Mitigation Measure CUL-18 (Human Remains).
- Procedures for Tribal access.
- Procedures for annual site condition verification, to document the condition of cultural resources throughout the life of the project and if impacts are observed, to provide additional protections, including but not limited to erosion controls and access barriers (consistent with Mitigation Measure CUL-8, Annual Site Condition Verification).
- Health and safety requirements for cultural resources personnel working onsite, including 40-hour Hazwoper training and copy of current certification for project records.
- Reporting procedures, including the requirement that reports resulting from documentation, evaluation, and treatment of cultural resources be filed with the SCCIC annually by April 1 of each year for work completed during the previous calendar year.
- Artifact collection, retention/disposal, and curation policies, including a statement that all cultural materials retained will be prepared in accordance with the requirements of an identified, qualified curatorial facility, per Mitigation Measure CUL-7 (Curation of Project Materials), and that the RPs shall be responsible for all expenses associated with the curation of the materials at the qualified curatorial facility.
- Preparation of an Annual Report that includes all cultural resources related activities that occurred for the previous calendar year. The annual report shall be submitted to DTSC for review and comment by March 1 of the year following the reporting year. The Annual Report shall include all documentation pertaining to Tribal communications required by Mitigation Measures CUL-11 through CUL-13, the Worker Cultural Resources Sensitivity Program required by Mitigation Measure CUL-3, the Annual Archaeological Monitoring Report with supporting documentation including daily logs required by Mitigation Measure CUL-5, all documentation resulting from eligibility evaluations and data recovery or other treatment resulting from Mitigation Measures CUL-4, and CUL-6, and the research design produced as part of the CRMP, and documentation resulting from the annual site condition verification program required by Mitigation Measure CUL-8; and
- Biennial review of the effectiveness of the CRMP by DTSC, in coordination with the RPs, SOI-qualified archaeologist, and Interested Tribes, during the life of the project to determine the need for any revisions to the CRMP either based on new cultural resources discoveries or other new information for which the CRMP provides inadequate direction, or revisions necessary to address procedural inadequacies.

CUL-3: Worker Cultural Resources Sensitivity Program. A worker cultural resources sensitivity program shall be implemented for the project. Prior to any ground-disturbing activity, an initial sensitivity training session shall be provided by the RPs to all project employees, contractors, subcontractors, and other professionals prior to their involvement in any ground-disturbing activities, with subsequent training sessions occurring on a quarterly basis to accommodate new personnel becoming involved in the project. The RPs shall invite Interested Tribes to participate in and present Native American perspectives during the training sessions if they so choose. The sensitivity program shall address: the cultural (Native American, archaeological, and paleontological) sensitivity of the project site and a tutorial providing information on how to identify these types of resources; appropriate behavior; worker access routes and restrictions; work area cleanliness; specific procedures to be followed in the event of an inadvertent discovery per the CRMP; safety procedures when working with monitors; and consequences in the event of noncompliance. The RPs shall notify DTSC and the Interested Tribes no less than 2 weeks prior to the training sessions. The program agenda and materials together with attendance rosters for the previous year shall be provided to DTSC as part of the Annual Report due March 1 of each year.

CUL-4: Avoidance and Preservation in Place. The RPs shall carry out, under the direction of DTSC, and require all subcontractors to carry out, all project activities in ways that minimize significant impacts to cultural resources. Avoidance and preservation in place shall be the preferred manner of mitigating impacts to historical and tribal cultural resources, taking into consideration the project objectives, in order to maintain the important relationship between artifacts and their archaeological context and to preserve each resource's scientific value, as well as to preserve the cultural values ascribed to resources by the Interested Tribes.

Where DTSC has determined that avoidance will be implemented, the construction zone shall be narrowed or otherwise altered to avoid cultural resources. In coordination with the SOI-qualified archaeologist, avoidance of cultural resources shall be ensured by the delineation of Environmentally Sensitive Areas, including an area within 100 feet of the known or previously mapped boundaries of the resources, and the resources shall be marked with exclusion markers as "Environmentally Sensitive Areas." Protective fencing shall not identify the protected area as a cultural resource area in order to discourage unauthorized disturbance or collection of artifacts.

Consistent with Mitigation Measure CUL-5 (Archaeological and Native American Monitoring), a qualified archaeological monitor shall monitor all project-related ground disturbing activities within 100 feet of the Environmentally Sensitive Areas, in order to ensure avoidance.

If due to cleanup requirements a cultural resource cannot be avoided, then the resource shall be evaluated for its individual eligibility for listing in the CRHR or as a unique archaeological resource, and for each resource's eligibility as a contributor to the Simi Hills Archaeological District and or the SSFL TCP, following the evaluation procedures detailed in the CRMP and consistent with the Simi Hills Archaeological District Study (Bray et al., 2016). If the resource is determined to be significant (i.e., eligible for individual listing in the CRHR or as a unique archaeological resource, and/or as a contributor to the Simi Hills Archaeological District and/or the SSFL TCP), DTSC, in coordination with Interested Tribes, would have the option to exercise the AOC

exception for "Native American artifacts that are formally recognized as Cultural Resources" or, in the case of resources located within Boeing-owned property (where the Exception is not applicable), may avoid impacts to the resource through coordinated project redesign. If DTSC elects not to exercise the AOC exception, or if avoidance of the significant cultural resource is determined by DTSC to be infeasible, then the resource would be subject to appropriate data recovery or treatment, following the treatment and reporting procedures detailed in the CRMP, that addresses the resource's relevant eligibility criteria and its eligibility as an individual resource, and/or a contributor to the District and/or TCP, as determined by DTSC and the SOI-qualified archaeologist, and in coordination with Interested Tribes.

CUL-5: Archaeological and Native American Monitoring. Archaeological monitoring shall be conducted during project-related ground-disturbing activities for the purpose of identifying and avoiding impacts to archaeological resources, consistent with the monitoring plan detailed in the CRMP. Ground-disturbing activities include, but are not limited to, brush clearance, grubbing, excavation, trenching, grading, and drilling.

Full-time archaeological monitoring shall occur during the following three activities:

- All initial brush clearance and vegetation removal.
- All ground-disturbing activities within 100 feet of an Environmentally Sensitive Area.
- All ground-disturbing activities within areas identified as having a high potential for buried archaeological resources as identified in Figure 7 of the *Santa Susana Field Laboratory Project: Geoarchaeological Assessment* (Lockwood, 2016).

Archaeological monitors shall have a B.S. or B.A. degree in anthropology, archaeology, or a related field, and at least one year's experience monitoring in California and shall be 40-hour HAZWOPER trained and currently certified. Archaeological monitors shall work under the direct supervision of an archaeologist meeting the minimum professional qualifications standards (PQS) set forth by the Secretary of the Interior (codified in 36 CFR Part 61; 48 FR 44739) consistent with Mitigation Measure CUL-1 (Cultural Resources Personnel Professional Qualifications Standards).

The number of archaeological monitors onsite at any given time during the three categories of ground disturbing activities described above shall be dependent on the size and geographic configuration of areas in which work is occurring. Archaeological monitors shall be positioned in proximity to the work sufficient for adequate visibility of surface and subsurface conditions. Typically, if two work areas are positioned more than 500 feet apart, a second monitor would be necessary to provide adequate monitoring of the activities. The number of archaeological monitors required for any given activity shall be determined by the SOI-qualified archaeologist and with the approval of DTSC.

Interested Tribes shall be invited to conduct Native American monitoring during all ground-disturbing activities associated with the project. A Native American monitor shall be invited to be onsite daily to coordinate with the archaeological monitors and to provide tribal perspectives in the event a discovery occurs. The Native American monitor shall be free to visit different activity areas throughout the course of a given day, notwithstanding any limitations based on safety concerns the RPs may identify in coordination with DTSC. Native American monitors shall be afforded a minimum of 1 weeks' notice prior

to the commencement of project-related ground-disturbing activities. During project activities, Native American monitors shall be provided with weekly work forecasts to facilitate scheduling of monitors. Because project implementation activities are often unpredictable, there may be changes in work activities. Native American monitors shall be notified by the RPs of any scheduling changes as soon as possible. The RPs will use daily field meetings, telephone, and email as methods of communicating work schedules. Native American monitors shall be alerted at the end of each work day whether work activities will be taking place the following day.

Archaeological monitors shall complete daily monitoring logs. Monthly progress reports shall be submitted to DTSC. An Annual Monitoring Report documenting monitoring activities shall be prepared following Archaeological Resources Management Report (ARMR) guidelines and shall be submitted to DTSC annually on March 1 for the previous calendar year as part of the Annual Report required by Mitigation Measure CUL-2. The monitoring reports shall document dates of monitoring and monitoring participants, activities observed, soil types observed, and any archaeological resources encountered. The RPs shall provide Interested Tribes an opportunity to contribute their monitoring observations to the monitoring reports. DPR 523 forms, following the OHP's *Instructions for Recording Historical Resources,* shall be prepared and filed with the SCCIC for all newly identified or updated resources and shall be appended to the Annual Monitoring Report. The Annual Monitoring Report shall be provided to the Interested Tribes for review and comment consistent with Mitigation Measure CUL-11 (Native American Document Review and Comment).

CUL-6: Inadvertent Discovery of Potential Historical Resources and Unique Archaeological Resources. In the event that cultural resources are inadvertently discovered during ground-disturbing activities, work in the vicinity of the discovery shall immediately cease within a 100-foot radius and temporary protective measures shall be implemented pursuant to provisions of the CRMP. If an archaeological monitor is present onsite, he or she shall be summoned to assess the significance of the find in coordination with the SOI-qualified archaeologist. If a monitor is not present onsite, no work within 100 feet of the find shall occur until an archaeological monitor or the SOI-qualified archaeologist can report to the site to assess the significance of the find.

The RPs shall notify DTSC within 24 hours of the discovery of any potential historical, unique archaeological, or tribal cultural resources. Avoidance and preservation in place shall be the preferred manner of mitigating impacts to such resources, taking into consideration the project objectives of soil remediation, in order to maintain the important relationship between artifacts and their archaeological context and to preserve each resource's scientific value, as well as to preserve the cultural values ascribed to resources by the Interested Tribes. The feasibility of avoidance, as it relates to the project objectives of soil remediation, shall be determined by DTSC based on factors including soil contamination levels in coordination with Interested Tribes and the relevant RP. Avoidance shall be ensured by the delineation of Environmentally Sensitive Areas, including an area within 100 feet of the resource (unless a smaller buffer is agreed to between the SOI-qualified archaeologist, Native American monitor, RP, and upon DTSC approval), which shall be marked with exclusion markers. Protective fencing shall not identify the protected area as a cultural resource area in order to discourage unauthorized disturbance or collection of artifacts.

If due to project design changes or cleanup requirements a cultural resource cannot be feasibly avoided, then the resource shall be evaluated for individual eligibility for listing in the CRHR or as a unique archaeological resource, and for its eligibility as a contributor to the Simi Hills Archaeological District and/or the SSFL TCP, following the evaluation procedures detailed in the CRMP and consistent with the Simi Hills Archaeological District Study (Bray et al. 2016). If the resource is determined to be significant (i.e., eligible for listing in the CRHR or as a unique archaeological resource, or as a contributor to the Simi Hills Archaeological District and/or the SSFL TCP), DTSC, in coordination with Interested Tribes, would have the option to exercise the AOC exception for "Native American artifacts that are formally recognized as Cultural Resources" (AOC exception) or, in the case of resources located within Boeing-owned property, may avoid impacts to the resource through project redesign. If DTSC elects not to exercise the AOC exception, or if avoidance of the significant cultural resource is determined to be infeasible by DTSC, then the resource would be subject to appropriate data recovery or treatment, following the treatment and reporting procedures detailed in the CRMP, that addresses the resource's relevant eligibility criteria and its eligibility as an individual resource, and/or a contributor to the District or SSFL TCP, as determined by DTSC and the SOI-qualified archaeologist, and in coordination with Interested Tribes. Documentation resulting from eligibility evaluations and data recovery or other treatment occurring during the previous calendar year shall be made part of the Annual Report due to DTSC by March 1 of the following calendar year as prescribed in Mitigation Measure CUL-2 **(**Preparation of a Cultural Resources Management Plan).

CUL-7: Curation of Project Materials. Prior to the start of initial activities or overall site cleanup, the RPs shall agree upon, and upon discretionary approval by DTSC, a single accredited repository at which to curate all archaeological materials recovered from SSFL. The repository shall be located in southern California so that the materials are available locally to Tribal members and researchers and shall meet the standards provided in the California State Historical Resources Commission's Guidelines for the Curation of Archaeological Collections. The RPs shall work with the identified local curatorial facility to transfer curation of materials currently in the RPs' possession or currently housed at a non-local facility, to the agreed-upon accredited local repository such that the materials can be accessioned as a unified collection. If it is determined that there is no southern California curation facility that can accommodate the entire SSFL collection, other accredited facilities in the State of California may be considered.

CUL-8: Annual Site Condition Verification. As part of the CRMP required by Mitigation Measure CUL-2, the RPs shall establish an annual site condition verification program to document the condition of all identified cultural resources in the project site including evaluated and unevaluated resources. The site verification program shall be implemented by an SOI-qualified archaeologist on an annual basis for the duration of the project. The RPs shall afford Interested Tribes the opportunity to participate in Native American monitoring during the annual site condition verification program and provide, at a minimum, 2 weeks' written notice to Interested Tribes prior to the commencement of the program each year.

The goal of the annual site condition verification program is to monitor on an annual basis whether project-related activities are indirectly impacting known cultural resources as a result of an increase in personnel and human activity onsite, changes in erosional patterns due to the movement of soils onsite, and other disturbances to resources that could be an inadvertent result of project activity. The annual site condition verification program shall include: development of Site Condition Assessment Forms and database; confirmation of resource boundaries with submeter GPS; relocation of previously identified features; confirmation of locations, quantities, and types of artifacts present; examination of the condition of rock art; general condition and disturbances observed; and photography to document whether any change in resource condition has occurred. DPR 523 form updates, following OHP *Instructions for Recording Historical Resources,* shall be prepared and filed with the SCCIC for all resources where changes in setting or condition are observed. The Site Condition Assessment Forms, database spreadsheet, DPR 523 form updates, and documentation of the implementation of additional protective measures for resources where impacts are observed, shall be provided to DTSC annually by March 1 for the previous calendar year as part of the Annual Report required by Mitigation Measure CUL-2 (Preparation of a Cultural Resources Management Plan). The RPs shall notify DTSC upon scheduling and completion of the program each year. Mitigation Measure CUL-11 (Native American Document Review and Comment) shall govern review and comment of the report by Interested Tribes.

If the annual site condition verification program identifies impacts to cultural resources resulting from implementation of the project, or if, at any time, the RPs or DTSC become aware of such impacts, the appropriate RP shall notify DTSC immediately and implement additional protective measures including but not limited to erosion controls and access barriers or other measures as necessary to protect cultural resources from project impacts, as recommended by the SOI-qualified archaeologist in coordination with Interested Tribes.

CUL-9: Comprehensive District Study and National Register Nomination. Following the completion of all archaeological studies related to project implementation, the RPs shall retain, and DTSC shall have discretionary approval of, an SOI-qualified archaeologist who will prepare a Comprehensive Simi Hills Archaeological District Study. The Study shall build on the previously prepared Simi Hills Archaeological District Study (Bray et al., 2016), and shall document and analyze all additional archaeological resources data generated as a result of the project, including data collected through testing, data recovery, and treatment. The Study shall consider similar research questions and shall re-evaluate the boundaries of and contributors to the District in light of the additional data and project impacts. If the Study finds that the District continues to retain sufficient integrity for listing, a National Register Nomination for the District will be prepared. The Study and Nomination shall be submitted to DTSC for review and comment within 1 year of the completion of project activities. The Study shall be submitted to the SCCIC once approved and finalized and the Nomination shall be coordinated by the SOI-qualified archaeologist with SHPO and National Park Service.

CUL-10: Burro Flats Site Complex Documentation and National Register Nomination. Prior to project implementation, NASA and Boeing shall retain, and DTSC shall have discretionary approval of, an SOI-qualified archaeologist to confirm the boundary of the Burro Flats Site Complex on both NASA and Boeing land. Based on this boundary confirmation, the SOI-qualified archaeologist shall prepare an updated DPR 523 form and National Register Nomination form for the Burro Flats Site Complex. The Nomination shall be prepared within one year of the boundary confirmation. The updated Nomination shall utilize and synthesize all available existing information on the Burro Flats Site Complex and shall be coordinated by the SOI-qualified archaeologist with SHPO and National Park Service.

CUL-11: Native American Document Review and Comment. Interested Tribes shall be afforded the opportunity to review and comment on all draft cultural-resources-related documentation prepared as a result of the project. Native American comments must be provided in writing for consideration by DTSC, in coordination with the RPs prior to a document being finalized. Draft cultural resources documents to be made available for Interested Tribes' comment shall include, but not be limited to the CRMP; cultural-resources-related technical reports; site condition verification documentation; and annual reports.

CUL-12: Native American Access. Interested Tribes shall be provided reasonable access to the project site upon written request to the RPs, to the extent that the landowners and land managers have the authority to facilitate such access and be consistent with existing laws, regulations, and agreements as they pertain to property within the project site. There may be access restrictions into certain areas, subject to DTSC review, with regard to health and safety concerns and to ensure noninterference with approved remediation activities. The RPs shall retain copies of all access-related communications to be provided to DTSC on an annual basis, as required by Mitigation Measure CUL-13 (Native American Communication).

CUL-13: Native American Communication. The RPs shall communicate with Interested Tribes prior to the start of and during remediation activities for the project, regarding project progress, upcoming site remediation activities, and other topics of interest to Interested Tribes. The RPs shall document, and accommodate, the Tribes' preferences for method and timing of communication and for transmitting large documents. Outreach efforts between the Interested Tribes and the RPs shall be communicated by the RPs to DTSC on an annual basis during project activities for review and input, as part of the annual report due to DTSC on March 1 of each year, as required by Mitigation Measure CUL-2 (Preparation of a Cultural Resources Management Plan).

CUL-14: Comprehensive Ethnographic Study. Within 1 year following the start of project activities, the RPs shall retain, and DTSC shall have discretionary approval of, a qualified ethnographer with demonstrated expertise in the field of ethnography and cultural anthropology, to prepare a Comprehensive Ethnographic Study that documents the ethnographic context in which the SSFL TCP and contributing archaeological resources exist, focusing on the SSFL and surrounding Simi Hills. The qualified ethnographer shall be selected in coordination with Interested Tribes, to the extent that Interested Tribes elect to participate. The purpose of the Study will be to provide an ethnographic context for the SSFL TCP, to attempt to capture the significance and

traditional cultural value ascribed to the SSFL TCP, and to provide a form of preservation and dissemination of Native American perspectives of the landscape and the places and material remains within it. The Study shall be prepared in coordination and collaboration with Interested Tribes, to the extent that Tribes choose to participate, and shall include interviews with representatives of Interested Tribes who express interest in participating. The draft Study shall be submitted to DTSC and Tribal Governments for review and comment within 2 years of the start of project activities.

CUL-15: Rock Art Site Recordation and Interpretation. The RPs shall retain, and DTSC shall approve, an SOI-qualified archaeologist with demonstrated expertise in the field of rock art studies to coordinate the comprehensive recordation and interpretation of all archaeological sites within the project site that contain rock art. The methods of recordation and the interpretations developed shall be coordinated and collaborated with Interested Tribes.

The rock art site recordation component shall involve thorough documentation of archaeological sites containing rock art, their immediate setting within the SSFL and Simi Hills, and the rock art itself, with the goal of documenting their condition prior to project implementation, and preparing an interpretive report focused on the results of the documentation, and interpretation of the age, content, and artistic style of the rock art. The documentation shall be accomplished through the use of accepted methodologies and current state-of-the-art technologies, which shall include (but are not limited to) mapping, digital photography, stereo spherical gigapixel photography, drawing, photogrammetry, laser scanning, digital image processing techniques including D-Stretch, Reflectance Transformation Imaging, residue analysis, and archaeological dating and/or other rock art documentation techniques provided by the Center of Interdisciplinary Science for Art, Architecture, and Archaeology at University of California, San Diego, or other service provider who conducts similar documentation techniques. The rock art site documentation shall be completed prior to the start of project activities in order to capture the pre-project condition of the rock art sites and to ensure that the pre-project condition and setting and feeling of the rock art sites is captured prior to disturbances.

The rock art interpretation component (an interpretive report) shall include a description of the regional context for the rock art; a review of regional and local rock art types, techniques, pigments, and chronologies; and interpretation of symbolism. The RPs shall collaborate with the SOI-qualified archaeologist, Interested Tribes (to the extent Tribes chose to participate), and DTSC on the content and interpretations to be studied and presented in the report.

The rock art documentation and report shall be submitted to DTSC within 1 year of the completion of recordation and shall be submitted to the SCCIC and copies to Interested Tribes upon request to the RPs.

CUL-16: Research Grant for Future Cultural Resources Studies. Within 6 months of project approval, each RP shall make a 1-year grant contribution to the National Science Foundation (NSF) for studies on topics of tribal interest related to the cultural resources of the SSFL such that members of the Tribal community may identify aspects of the SSFL TCP and related archaeological resources impacted by the project that may warrant further preservation through study. Formal documentation that the grant contribution has been made to the NSF shall be provided to DTSC within 7 months of project approval.

Each of the three grants would enable an undergraduate or graduate student to use the cultural resources data obtained through the implementation of project-related archaeological, ethnographic, and rock art mitigation in the preparation of a research project, such as a thesis, dissertation, or published paper. Each student would enter into an agreement that sensitive archaeological site and tribal information is kept confidential. If the NSF is unable to find students interested in using the grant for studies of the cultural resources of the SSFL within 10 years of the funding of the grant, then the grant funds will be returned to the RPs or their designees, who may, at their discretion, elect to contribute the funding to another, similar topic of study in the larger Santa Monica Mountains Region and adjacent coast.

CUL-17: Paleontological Resources Monitoring and Mitigation Plan. Prior to the start of initial project or program level activities, the RPs shall retain a qualified principal paleontologist (investigator) meeting the SVP (2010) standards to prepare a Paleontological Resources Monitoring and Mitigation Plan (PRMMP). The PRMPP shall be approved by DTSC before work (including, but not limited to, ground-disturbing activities) may be initiated on the site. The PRMPP shall include:

- Retention of Qualified Staff: The PRMMP shall stipulate that qualified professionals meeting the SVP (2010) standards shall conduct paleontological work.
- Construction Worker Sensitivity Training: The PRMMP shall state that construction personnel shall be trained to understand what paleontological resources are, which types of fossils may be encountered during ground disturbance, and measures used to protect paleontological resources in compliance with CEQA and other relevant legislation. Construction personnel shall also be trained on the procedures to be followed upon the discovery of paleontological materials with and without a paleontological monitor onsite. Personnel shall be instructed that unauthorized collection or disturbance of fossils is unlawful and can result in criminal penalties.
- Monitoring Requirements: The PRMMP shall require full-time monitoring of ground disturbing activities in the high sensitivity Santa Susanna Formation (Tsu, Tsuv, and Tsi), the moderate to high lower Chatsworth Formation (Kcsh), and the moderate sensitivity detrital sediments of Lindero Canyon geological unit (Tls and Tlsc). The PRMMP shall also require part-time monitoring below a depth of 3 feet in the low to moderate sensitivity upper Chatsworth Formation (Kcs) and low sensitivity Quaternary alluvium (Qa) to ensure no significant paleontological resources are being impacted. The PRMMP shall develop a coordination strategy to ensure adequate monitoring of construction disturbances, and procedures to reduce, or discontinue monitoring in nonproductive geological lenses per the SVP (2010) guidelines. The PRMMP shall also detail the daily and weekly reporting requirements of the paleontological monitor and/or qualified principal paleontologist.
- Preparation of High Resolution Geological Maps: The PRMMP shall require preparation of high resolution maps that depict the geological formations/units underlying the SSFL. The maps shall detail the locations of high sensitivity Santa Susanna Formation (Tsu, Tsuv, and Tsi), the moderate to high lower Chatsworth Formation (Kcsh), and the moderate sensitivity detrital sediments of Lindero Canyon geological unit (Tls and Tlsc) where full-time monitoring is required, and the locations of low to moderate sensitivity upper Chatsworth Formation (Kcs) and low sensitivity Quaternary alluvium (Qa) where part-time monitoring is required.

- Discovery and Fossil Recovery Procedures: The PRMMP shall present procedures for halting or redirecting construction and setting up an exclusion zone with flagging tape when the paleontological monitor or construction personnel make a discovery if the monitor is not present. Provisions shall be included that identify notification procedures for unanticipated fossil discoveries by construction personnel when a paleontological monitor is not present and describe fossil recovery methods (including necessary equipment) and adequate data collection. The PRMMP shall emphasize the importance of collecting accurate geographic, stratigraphic, and sedimentologic data (including samples for radiometric dating if applicable).
- Sampling: The PRMMP shall include sampling methods and frequency of sampling (e.g., collecting sediment samples for microfossil recovery per the SVP [2010] guidelines), as well as other applicable procedures. The qualified paleontologist overseeing the project shall determine if and when it is appropriate to test a horizon for the presence of microfossils based on sedimentologic indicators (abundant plant debris, fine-grained sediments, carbonate nodules, etc.). The test sample shall consist of approximately 6000 pounds of sediment to be screened onsite or offsite. If scientifically significant microfossils are recovered, a standard sample shall be collected and screened on or offsite (a standard sample is approximately 4 cubic yards or 6000 pounds per the SVP [2010] guidelines). Contaminated fossils should be safely handled to ensure worker health and safety. Specific safe handling procedures should be established in the PRMMP.
- Post-Excavation Preparation, Analysis, Reporting, and Curation: The PRMMP shall discuss procedures for post-excavation preparation and analyses of fossil specimens collected during project-related excavations and shall provide analytical techniques. The report shall detail the identification of specimens, final curation of specimens at an accredited facility, data analyses, and reporting. The final monitoring report shall include a discussion of the background information for the project; the geology and stratigraphy of impacted geological units; mitigation methods, including fossil treatment and any recommendations for further work; a description and inventory of salvaged paleontological resources; scientific importance of the salvaged paleontological resources; the results and findings of analyses conducted on fossil remains; research questions that may be answered or raised as a result of the analyses; and pertinent maps with fossil localities. Maps showing fossil localities shall be included in a confidential appendix.

CUL-18: Inadvertent discovery of human remains. In the event of inadvertent discovery of human remains, all work shall be halted within a 100-foot radius and temporary protective measures shall be implemented. Avoidance and preservation in place shall be emphasized as the preferred manner of mitigation for human remains and disturbances shall be avoided to the maximum extent feasible as it relates to the project objectives of soil remediation, as determined by DTSC, in coordination with Interested Tribes and respective RPs. The RPs shall notify DTSC of any inadvertent discovery of human remains within 24 hours of the discovery.

On non-federally owned land (Area I, Area III, Area IV, the Northern Undeveloped Area, and the Southern Undeveloped Area), the RPs shall contact the Ventura County Coroner to evaluate the remains and follow the procedures and protocols set forth in Section 15064.4 (e)(1) of CEQA. If the Coroner determines the remains are Native American in origin, the Coroner shall contact the NAHC. As provided in PRC Section 5097.98, the NAHC shall identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent (MLD) shall be afforded the opportunity to provide recommendations concerning the future disposition of the remains and any associated grave goods as provided in PRC Section 5097.98. Per PRC Section 5097.98, the landowner shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located, is not damaged or disturbed by further development activity until the landowner has discussed and conferred with the MLD regarding their recommendations, taking into account the possibility of multiple human remains.

On federally owned land (Area II and the NASA-owned portion of Area I), NASA shall be notified and human remains and associated funerary objects shall be treated pursuant to the Native American Graves Protection and Repatriation Act and in accordance with Stipulation VIIB of the NASA Programmatic Agreement.

4.4.7 Impact Summary

Incorporation of Mitigation Measures CUL-1 through CUL-16, BIO-2, BIO-5, BIO-12, and BIO-19 would avoid, minimize, rectify, reduce, or compensate for potential direct and indirect impacts to historical resources, unique archaeological resources, and tribal cultural resources resulting from overall site cleanup and initial activities, but would not mitigate the effects to a point where no significant effect on the environment would occur. Impacts to historical resources, unique archaeological resources, and tribal cultural resources would remain significant and unavoidable. No impact to built environment resources resulting from overall site cleanup and initial activities has been identified. Implementation of Mitigation Measure CUL-17 would reduce impacts to unique paleontological resources or sites or unique geologic features to a less-than-significant level. Implementation of Mitigation Measure CUL-18, together with Mitigation Measures CUL-1 through CUL-6, would reduce impacts to human remains to a less-than-significant level

Table 4.4-6 summarizes the proposed project's impacts and significance determinations related to cultural resources.

TABLE 4.4-6
SUMMARY OF IMPACTS – CULTURAL RESOURCES

Impact	Overall Project	DOE Initial Project	NASA Initial Project	DOE Demolition Activities	RCRA Post-Closure and Facility Closure	Mitigation Measures
Impact 4.4-1a: Adverse effect on Archaeological Sites Qualifying as Historical Resources or Unique Archaeological Resources	S&U	--	--	--	--	CUL-1 through CUL-10
Impact 4.4-1b: Adverse effect on Archaeological Sites Qualifying as Historical Resources or Unique Archaeological Resources	--	S&U	S&U	S&U	S&U	CUL-1 through CUL-10
Impact 4.4-2a: Adverse effect on tribal cultural resources	S&U	--	--	--	--	CUL-1 through CUL-16, BIO-2, BIO-5, BIO-12, and BIO-19
Impact 4.4-2b: Adverse effect on tribal cultural resources	--	S&U	S&U	S&U	S&U	CUL-1 through CUL-16, BIO-2, BIO-5, BIO-12, and BIO-19
Impact 4.4-3a: Adverse effect on built environment resources qualifying as historical resources	NI	--	--	--	--	N/A
Impact 4.4-3b: Adverse effect on built environment resources qualifying as historical resources	--	NI	NI	NI	NI	N/A
Impact 4.4-4a: Adverse effect on a unique paleontological resource or site or unique geologic feature	LSM	--	--	--	--	CUL-17
Impact 4.4-4b: Adverse effect on a unique paleontological resource or site or unique geologic feature	--	LSM	LSM	LSM	LSM	CUL-17
Impact 4.4-5a: Adverse effect by disturbing human remains including those interred outside of formal cemeteries	LSM	--	--	--	--	CUL-1 through CUL-6 and CUL-18
Impact 4.4-5b: Adverse effect by disturbing human remains including those interred outside of formal cemeteries	--	LSM	LSM	LSM	LSM	CUL-1 through CUL-6 and CUL-18

NI = No Impact
S&U = Significant and unavoidable
LSM = Less than significant with mitigation incorporated

4.5 Geology, Soils, and Seismicity

This section analyzes the potential impacts associated with geology, seismicity, and soils relevant to the overall site cleanup and the initial activities. The existing geological setting is provided along with the relevant regulatory background. Applicable project impacts and mitigation measures, as necessary, are presented. The analysis in this section is based on review of available information from the U.S. Geological Survey (USGS), the California Geological Survey (CGS; formerly the California Division of Mines and Geology), and the Natural Resources Conservation Service (NRCS).

4.5.1 Environmental Setting

4.5.1.1 Location and Topography

The project site is located in the western Transverse Ranges geomorphic province of California, a province identified by a series of east-west trending steep mountain ranges and valleys (CGS, 2002). These valleys and mountain ranges result from intense north-south compression along an east-west trending bend in the San Andreas Fault Zone that marks the boundary between the Pacific and North American Plates. Due to its proximity to the plate boundary, the region is seismically active. The project site is located within the Simi Hills, which rise to approximately 2,400 feet AMSL. The topography within the project site varies from approximately 1,175 feet AMSL at the eastern property boundary near Dayton Canyon to approximately 2,245 feet AMSL near the center of the project site (MWH, 2009).

4.5.1.2 Regional Geology

Within the Transverse Ranges province, the region encompassing the project site includes the Simi Valley, the Thousand Oaks Valley, the western San Fernando Valley, the Simi Hills, and portions of the Santa Susana and Santa Monica Mountains (MWH, 2009). Basement rocks exposed in the Santa Susana Mountains and Simi Hills are primarily of sedimentary and volcanic origin, and range in age from Late Cretaceous (about 65 million years ago) to Late Pliocene (about 1.6 million years ago). These units are well exposed except where overlain by alluvium in some valleys and canyons. The sedimentary rocks in the region encompassing the project site range from coarse-grained sandstone and conglomerate to fine-grained siltstone and shale.

Figure 4.5-1 shows the geologic map for the project site and surrounding area (MWH, 2009). The geologic units in the region are generally marine and non-marine sedimentary and volcanic rocks. The Chatsworth Formation underlies most of the project site, except for western and southeastern portions of the site where either the Santa Susana Formation or the detrital sediments of Lindero Canyon are present (see Figure 4.5-1). Deposited about 70 to 65 million years ago, the Chatsworth Formation is at least 6,000 feet thick (Yerkes and Campbell, 2005) and currently extends more than 2,000 feet below sea level in the vicinity of the project site. It is the primary rock unit exposed at the project site. The Chatsworth Formation primarily consists of sandstone with thin interbeds of siltstone, although conglomerate and shale members of the Chatsworth Formation are also expressed at the surface in the Simi Hills.

Overlying the Chatsworth Formation (generally extending northwest from the Chatsworth Formation) is a sequence of younger (i.e., Tertiary, about 65 to 5 million years before present) sedimentary and volcanic marine and non-marine formations. From oldest to youngest, the overlying sedimentary formations are the Simi Conglomerate and the Las Virgenes, Santa Susana, Llajas, Sespe, Vaqueros, Topanga, Calabasas, and Modelo/Monterey Formations. The Simi, Las Virgenes, and Sespe Formations were deposited primarily in streams or alluvial fan environments, whereas the other Tertiary formations were deposited primarily in marine environments. The total aggregate thickness of these sedimentary units is greater than 40,000 feet (Yerkes and Campbell, 2005). The region's youngest geologic units consist of Quaternary alluvium within the Simi, San Fernando, and other area valleys. These largely consist of stratified, but unconsolidated, sands, silts, and clays formed by material eroded from adjacent, uplifted rocks.

The Chatsworth Formation in the vicinity of the project site is subdivided informally into upper and lower units (MWH, 2009). The lower Chatsworth Formation is exposed in the southeastern project site (mostly within the Southern Undeveloped Area), while the upper Chatsworth is exposed in much of the remainder of the project site where much of the proposed cleanup activities are planned. The upper Chatsworth is further divided into coarser- and finer-grained members. The coarse-grained members are primarily sandstone, and the finer-grained members mostly siltstone and shale.

The site is characterized by many fractured outcrops of the bedrock units described above, due to the combination of lithology and tectonic history of the Simi Hills, described further below. However, alluvium and thin soils have developed on portions of the project site. Alluvium has accumulated to thicknesses greater than 5 feet over approximately 315 acres (11 percent) of the project site, generally limited to topographic lows and ephemeral streams. These areas often coincide with the locations of roads and buildings, and proposed cleanup areas. In addition to the naturally occurring unconsolidated deposits, artificial fill derived from onsite disturbed soils has been placed in developed portions of the project site.

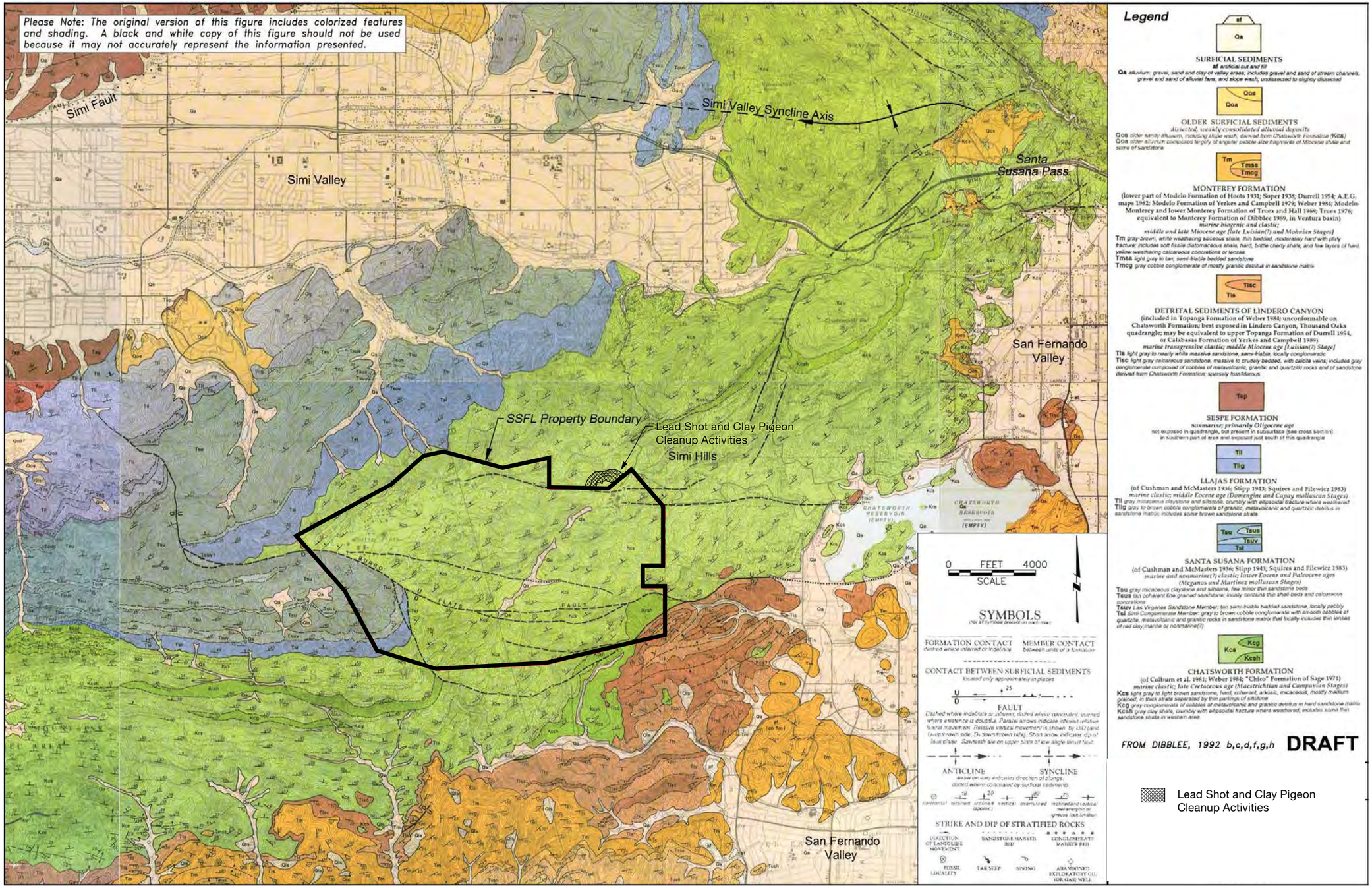
4.5.1.3 Faulting and Seismicity

As noted above, the project site is located in a region that is seismically active, and evidence exists that the region has been seismically active for tens of millions of years (Yerkes and Campbell, 2005). The rocks in the vicinity of the project site have undergone multiple rounds of folding and faulting since deposition.

Earthquake Mechanisms and Fault Activity

Faults are planar features within the earth's crust that have formed to release strain caused by the dynamic movements of the earth's major tectonic plates. An earthquake on a fault is produced when these strains overcome the inherent strength of the earth's crust, and the rock ruptures. The rupture causes seismic waves that propagate through the earth's crust, producing the ground shaking effect known as an earthquake. The rupture also causes variable amounts of slip along the fault, which may or may not be visible at the earth's surface.

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of this figure should not be used because it may not accurately represent the information presented.



SOURCE: MWH, 2009

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Figure 4.5-1
Geologic Map

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Geologists commonly use the age of offset rocks as evidence of fault activity—the younger the displaced rocks, the more recently earthquakes have occurred. To evaluate the likelihood that a fault would produce an earthquake, geologists examine the magnitude and frequency of recorded earthquakes and evidence of past displacement along a fault. The State of California considers a fault to be "active" if evidence exists of surface displacement within about the past 11,000 years (Holocene epoch); the USGS uses 15,000 years to define active faults. A Quaternary fault is defined as a fault that has shown evidence of surface displacement during the Quaternary period (about the last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not mean that a fault lacking evidence of surface displacement is necessarily inactive. The term "sufficiently active" is also used to describe a fault if there is some evidence that Holocene displacement has occurred on one or more of its segments or branches (Bryant and Hart, 2007).

For the purpose of delineating fault rupture zones, the CGS historically sought to delineate faults defined as potentially active, which are faults that have shown evidence of surface displacement during the Quaternary period (the last 1.6 million years). Older maps still use the "potentially active" term. However, under the Alquist-Priolo Earthquake Fault Zoning Act, usage of this term was discontinued when it became apparent that the sheer number of Quaternary-age faults in the state made it meaningless to delineate all of them (Bryant and Hart, 2007). In late 1975, the State Geologist made a policy decision to delineate only those faults that had a relatively high potential for ground rupture, determining that a fault should be considered for delineation only if it was sufficiently active and "well defined."[1] Blind faults[2] do not show surface evidence of past earthquakes, even if they occurred in the recent past; and faults that are confined to pre-Quaternary rocks (more than 1.6 million years old) are considered inactive and incapable of generating an earthquake.

Earthquake Magnitude

When an earthquake occurs along a fault, its size can be determined by measuring the energy released during the event. A network of seismographs records the amplitude and frequency of the seismic waves that an earthquake generates. The Richter magnitude (ML) of an earthquake represents the highest amplitude measured by the seismograph at a distance of 100 kilometers from the epicenter. Richter magnitudes vary logarithmically with each whole-number step, representing a ten-fold increase in the amplitude of the recorded seismic waves and 32 times the amount of energy released. While Richter magnitude was historically the primary measure of earthquake magnitude, seismologists now use Moment Magnitude as the preferred way to express the size of an earthquake. The Moment Magnitude (Mw) scale is related to the physical characteristics of a fault, including the rigidity of the rock, the size of fault rupture, and the style

[1] A fault is considered well defined if its trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The fault may be identified by direct observation or by indirect methods (e.g., geomorphic and geophysical evidence). The critical consideration is that the fault, or some part of it, can be located in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.

[2] A blind fault is a fault without a surface trace or other evidence of its existence that is reasonably observable at the surface.

of movement or displacement across the fault. Although the formulae of the scales are different, they both contain a similar continuum of magnitude values, except that Mw can reliably measure larger earthquakes and do so from greater distances.

Regional Seismicity and Earthquake Probability

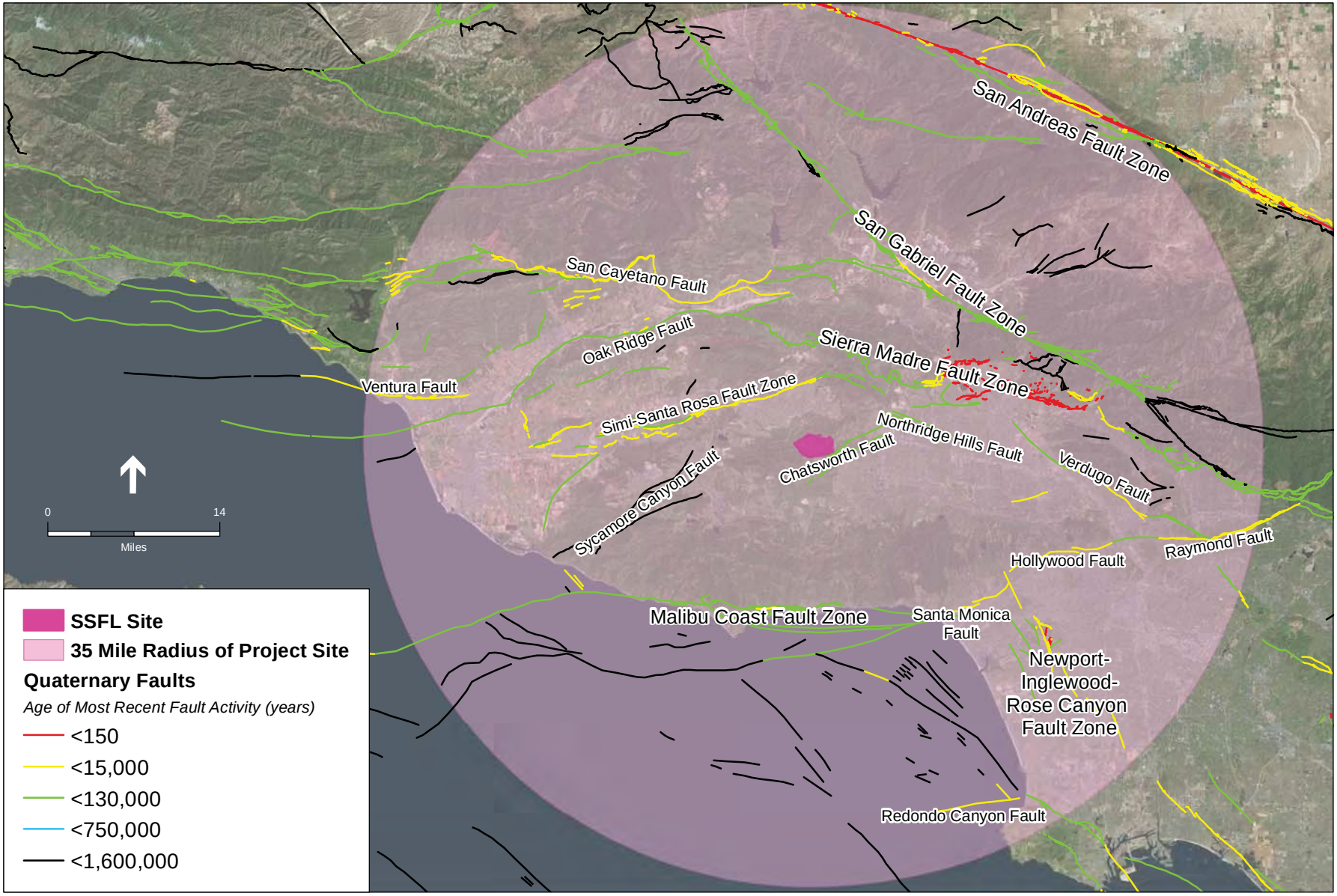
The nearest faults exhibiting evidence of activity within the last 15,000 years or less are faults in the Simi-Santa Rosa Fault Zone, located approximately 4 miles northeast of the project site (see **Figure 4.5-2**). The San Andreas Fault Zone, located approximately 30 miles northeast of the project site, is also active. In addition to these active faults, other faults within 5 miles of the project site exhibiting evidence of activity over the last 1.6 million years include the Chatsworth, Northridge Hills, and Sierra Madre Faults (USGS and CGS, 2006). Active and potentially active faults in the region are listed in **Table 4.5-1** below.

TABLE 4.5-1
ACTIVE AND POTENTIALLY ACTIVE FAULTS

Fault or Fault Zone	Location Relative to Project Component	Age of Faulting	Slip Rate (millimeters/ year)	Maximum Moment Magnitude (Mw)	Historical Seismicity[a]
Chatsworth Fault	Southeast and adjacent to project site	Late Quaternary (Potentially Active)	Unknown	6.0-6.8	None known
Simi-Santa Rosa Fault Zone	4 miles north	Holocene (Active)	0.2-1	Unknown	None known
Northridge Hills Fault	5 miles northeast	Late Quaternary (Potentially Active)	unknown	Unknown	None known
Sycamore Canyon Fault	7 miles west	Early Quaternary	< 0.2	Unknown	None known
Sierra Madre Fault Zone	11 miles northeast	Holocene (Active)	> 5	6.6	6.6 (1971)
Oak Ridge Fault	12 miles northwest	Late Quaternary (Potentially Active)	3.5-6	6.5-7.5	None known
San Cayetano Fault	12 miles northwest	Late Quaternary (Potentially Active)	>5	6.5-7.3	None known
Malibu Coast Fault Zone	13 miles south	Quaternary to Late Quaternary (Potentially Active)	0.2-1	Unknown	None known
San Gabriel Fault Zone	15 miles northeast	Late Quaternary (Potentially Active)	0.2-1	Unknown	None known
Newport-Inglewood-Rose Canyon Fault Zone	23 miles southeast	Holocene (Active)	1-5	6.0-7.2	4.9 (1920)
San Andreas Fault Zone	33 miles northeast	Holocene (Active)	>5	6.8-8	7.9 (1857)

[a] Richter Magnitude (ML) or Moment Magnitude (Mw) and year of recent or large events. References that cite earthquake magnitudes do not always specify whether the measurement used the Richter or Moment Magnitude scale; however, the ML and Mw values are similar.

SOURCES: SCEC, 2013; USGS and CGS, 2006.



SOURCE: USGS and CGS, 2006

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Figure 4.5-2
Regional Faults

The rocks of the Chatsworth Formation have been compressed, stretched, and twisted over the 65 million-year geologic history of the formation. Consequently bedding-parallel fractures[3] and joints (fractures that are nearly perpendicular to the bedding direction of the rock) are pervasive through the rocks underlying the project site, and many faults (shearing fractures with appreciable offset) are also present, as mapped in December 2009; however, these faults are not considered active because no evidence indicates movement has occurred more recently than 1.6 million years ago (MWH, 2009).

4.5.1.4 Seismic Hazards

Seismic hazards are generally classified into two categories: primary seismic hazards (surface fault rupture and ground shaking) and secondary seismic hazards (liquefaction and other types of seismically induced ground failure, such as seismically induced landslides).

Fault Rupture

The California Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act; described in greater detail below) prohibits the development of facilities for human occupancy[4] across active fault traces.[5] Under the Alquist-Priolo Act, the CGS must establish zones on either side of the active fault that delimit areas susceptible to surface fault rupture. These zones are referred to as fault rupture hazard zones and are shown on official maps published by the CGS. These zones vary in width, but average about one-quarter mile wide. While it is possible that surface rupture could occur outside of these zones, the risk of occurrence is not substantial.

The State Geologist has not designated any faults in the project site as active, and the project site is not located within any designated Earthquake Fault Zones. While faults have been mapped across the site, as shown in Figure 4.5-2, no evidence has been found of movement across these faults in the past 1.6 million years.

Seismic Ground Shaking

Probabilistic approaches to assessing seismic hazards use the statistics of earthquake occurrence in a region to estimate the level of ground motion for which the exceedance probability is acceptably low. The USGS has prepared National Seismic Hazard Maps which display the distribution of earthquake shaking levels that have a certain probability of occurring in the United

3 "Bedding-parallel" indicates that the geologic property in question occurs in a pattern that is parallel to the horizontal plane along which deposition of the sediments occurred.

4 A structure for human occupancy is one that is intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person hours per year (Hart, 1997).

5 The Alquist-Priolo Act designates zones that are most likely to experience fault rupture, although surface fault rupture is not necessarily restricted to those specifically zoned areas. The zones are defined by the CGS. For the purpose of delineating fault rupture zones, the CGS historically sought to also zone faults defined as potentially active, which are faults that have shown evidence of surface displacement during the Quaternary period (the last 1.6 million years). In late 1975, the State Geologist made a policy decision to zone only those faults that had a relatively high potential for ground rupture, determining that a fault should be considered for zoning as active only if it was sufficiently active and "well defined." Sufficiently active is also used to describe a fault if there is some evidence that Holocene displacement occurred on one or more of its segments or branches. Faults that are confined to pre-Quaternary rocks (more than 1.6 million years old) are considered inactive and incapable of generating an earthquake.

States. Maps for the nation, including California, were updated in 2014 to represent the best available science in earthquake hazards. The maps were developed with the input of scientists and engineers, and were reviewed by science organizations and State Geological surveys.

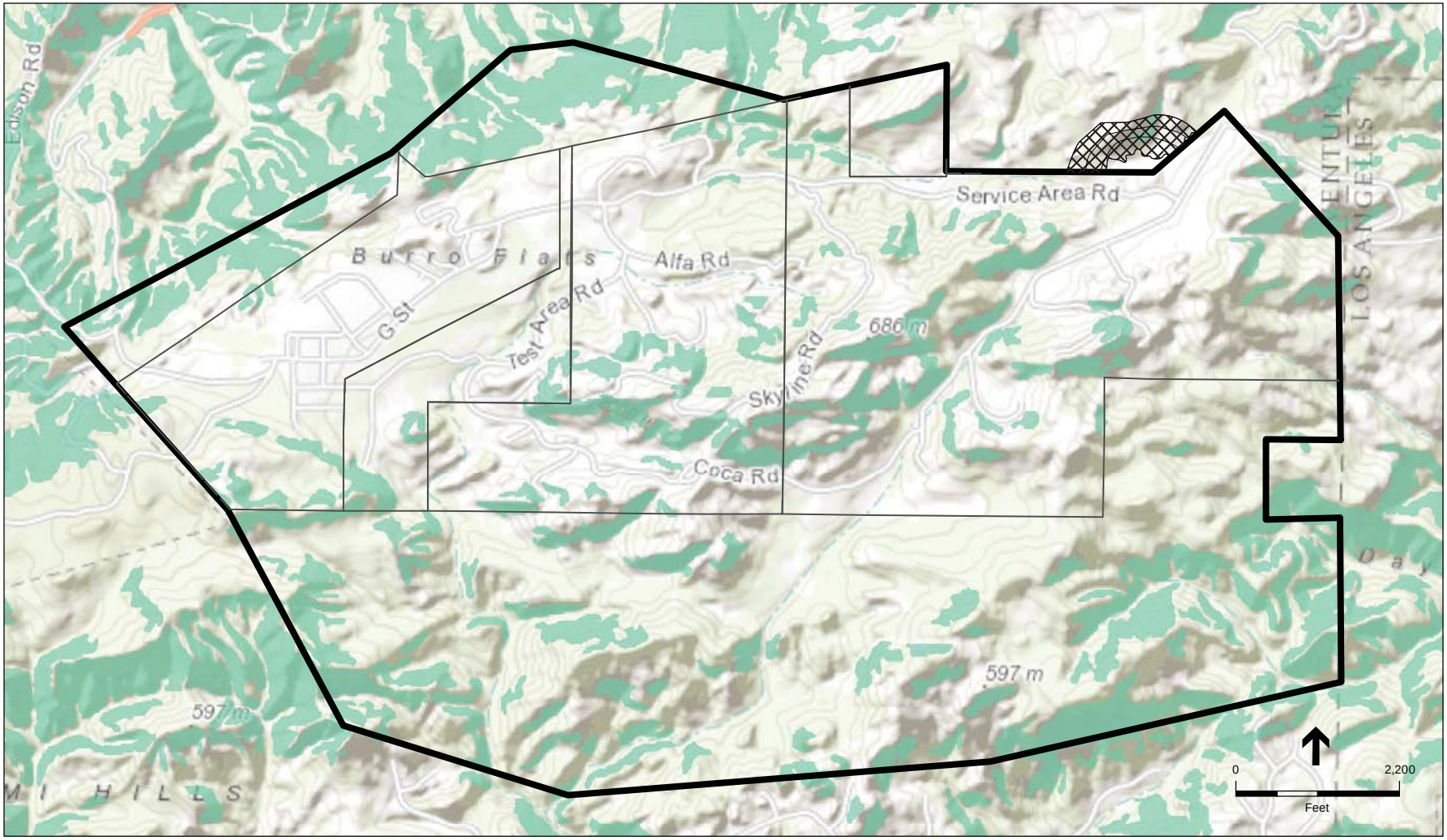
The maps show the annual probability of exceeding a set of ground motions (also expressed as ground acceleration, which expresses the forcefulness of ground shaking). The highest ground acceleration at a given location as a result of a certain earthquake magnitude is called the peak ground acceleration (PGA). Unlike measures of magnitude, which provide a single measure of earthquake energy, PGA varies from place to place and is dependent on the distance from the epicenter and the character of the underlying geology (e.g., hard bedrock, soft sediments, or artificial fills). The ground motions being considered at a given location are those from all future possible earthquake magnitudes at all possible distances from that location.

To determine seismic hazard, the California portion of the National Seismic Hazard Maps uses the Uniform California Earthquake Rupture Forecast version 3, a model that estimates the magnitude, location, and time-averaged frequency of potentially damaging earthquakes in California, developed by the Working Group on California Earthquake Probabilities. At the project site, the earthquake peak ground acceleration that has a 10 percent chance of being exceeded in 50 years has a value of 0.47g (CGS, 2008), which corresponds to shaking that would be widely felt by humans and could overturn unstable objects and break windows (Wald, et al., 1999; USGS, 2000).

Liquefaction and Lateral Spreading

Soil liquefaction is caused by pressure waves moving through the ground due to earthquakes. Research and historical data indicate that loose granular soils (such as nonindurated sand) and non-plastic silts that are saturated by relatively shallow groundwater (generally less than 50 feet) are susceptible to liquefaction. Liquefaction causes soil to lose strength and act like a liquid, triggering structural distress or failure due to the dynamic settlement of the ground or a loss of strength in the soils underneath facilities. Liquefaction in a subsurface layer can in turn cause lateral spreading of the ground surface, which usually takes place along weak shear zones that have formed within the liquefiable soil layer. Lateral spreading has generally been observed to take place in the direction of a free face (e.g., a retaining wall or slope).

As described above, most of the soil at the project site is very thin and underlain by weathered or unweathered bedrock. The limited-extent alluvial deposits over 5 feet deep are present in topographic lows across the site. These areas of alluvium are not mapped by the State of California as a liquefaction hazard zone, shown in **Figure 4.5-3** (CGS, 2006). The project site also is not mapped as a liquefaction area in Ventura County General Plan (Ventura County, 2013).



Liquefaction Hazard Zones

Seismically-Induced Landslide Hazard Zones

SSFL Boundary

Lead Shot and Clay Pigeon Cleanup Activities

Administrative Boundary

SOURCE: CGS, 2006

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Figure 4.5-3
Liquefaction and Landslide Hazard Zones

Earthquake-Induced Settlement

Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid rearrangement, compaction, and settling of subsurface materials (particularly loose, noncompacted, and variable sandy sediments). Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Areas are susceptible to differential settlement if underlain by compressible sediments, such as poorly engineered artificial fill. Artificial fill and compressible sediments that could be susceptible to earthquake-induced settlement are located in topographic lows and ephemeral streams within the project site.

Landslides

Landslides triggered by earthquakes have historically been a significant cause of earthquake-related damage. Areas that are most susceptible to earthquake-induced landslides are steep slopes in poorly cemented or highly fractured rocks, areas underlain by loose, weak soils, and areas on or adjacent to existing landslide deposits. The State of California identifies earthquake-induced landslide hazard zones as areas that have either been identified as having experienced landslide movement in the past, or areas where geologic and geotechnical data and analyses indicate that earth material may be susceptible to earthquake-induced slope failure (CGS, 2006). Areas of landslide hazard are present within and around the project site, as shown on Figure 4.5-3, particularly in the steeper slopes along the northwestern boundary of the site (CGS, 2006).

4.5.1.5 Surface and Subsurface Soil Conditions

In some areas within the project site and in the regional vicinity, the geologic units described above are overlain by a layer of soil. In general, soil characteristics are strongly governed by slope, relief, climate, vegetation, and the rock type upon which they form.

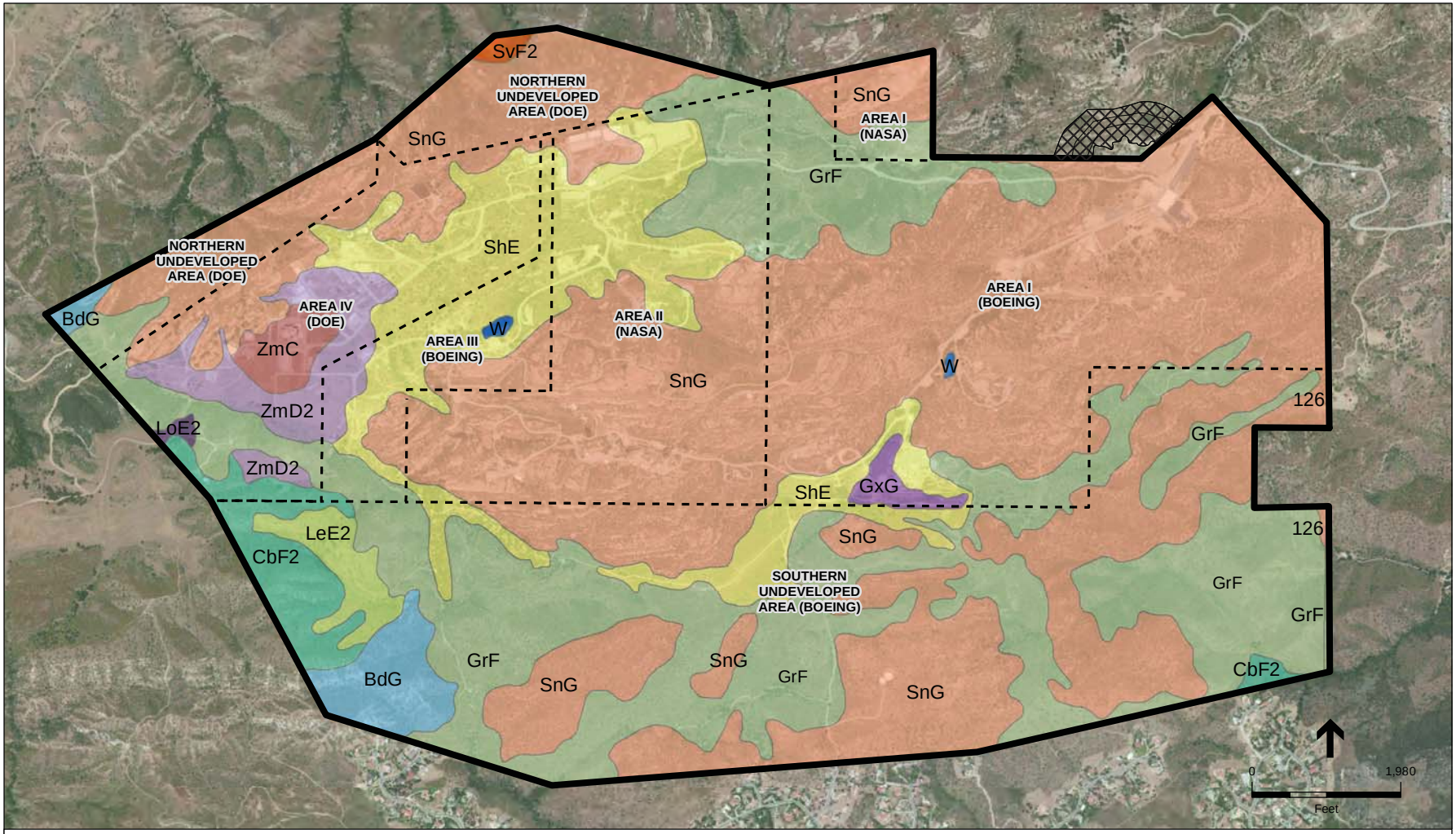
Soil types are important in describing engineering constraints such as erosion and runoff potential, corrosion risks, and various behaviors that affect facilities, such as expansion and settlement. Soil properties of interest for this analysis are summarized in **Table 4.5-2** and shown on **Figure 4.5-4**, below.

Factors identified in the table include linear extensibility, hydrologic group, erosion hazard, and corrosion hazard. These factors indicate how the soil may respond to construction activities. The erosion hazard rating in the table is based upon the whole soil erodibility (K) factor, which represents the combination of detachability of the soil, runoff potential of the soil, and the transportability of the sediment eroded from the soil. Major factors affecting soil erodibility are soil texture, the presence or amount of organic matter in the soil, soil structure, and soil permeability. The corrosion hazard rating is determined based upon the soil texture, soil water characteristics, soil acidity, and content of soluble salts.

TABLE 4.5-2
PROJECT SITE SOILS AND SELECT SOIL PROPERTIES THAT MAY AFFECT CLEANUP ACTIVITIES

Soil Map Unit	Soil Map Unit Name	Texture (Composition Description)	Linear Extensibility [A]	Hydrologic Group [B]	Erosion Hazard [C]	Corrosion		Depth to Restrictive Layer (inches) [D]	Restrictive Layer [D]
						Uncoated Steel	*Concrete*		
126	Rock	Unweathered bedrock	---	---	---	--	---	0-20	Unweathered bedrock
BdG	Badland	Weathered bedrock	---	---	---	---	---	0-60	Weathered Bedrock
CbF2	Calleguas	Channery loam, very channery silty clay loam	0.0–2.9	D	0.17 (Low)	Moderate	Moderate	8-20	Weathered Bedrock
GrF, 117	Gaviota	Sandy loam	0.0–2.9	D	0.2 (Low)	Moderate	Low	8-20	Unweathered bedrock
GxG	Gullied land	Variable	---	---	---	---	---	---	
LeE2	Linne	Silty clay loam	3.0–5.9	C	0.43 (Moderate)	Moderate	Low	24-48	Weathered Bedrock
LoE2	Los Osos	Clay loam, Clay	6.0–8.9	D	0.28 (Moderate)	High	Low	20-40	Weathered Bedrock
ShE	Saugus	Sandy loam, Loam	0.0–2.9	B	0.43 (Moderate)	Low	Low	40-60	Weathered Bedrock
SnG	Rock	Unweathered bedrock	---	---	---	---	---	0-20	Unweathered bedrock
SvF2	Soper	Gravelly loam, Very gravelly clay loam	3.0–5.9	C	0.17 (Low)	Moderate	Low	24-40	Weathered Bedrock
W	Water	Water	---	---	---	---	---	---	n/a
ZmC	Zamora	Loam, Clay loam	3.0–5.9	C	0.55 (High)	Moderate	Low	---	n/a
ZmD2	Zamora	Loam, Clay loam	3.0–5.9	C	0.55 (High)	Moderate	Low	---	n/a

[A] The linear extensibility of shrink-swell potential is low if the soil has a linear extensibility of less than three percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent.
[B] There are four hydrologic soils groups (A, B, C, D). A hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. Group A includes soils having a high infiltration rate (low runoff potential) when thoroughly wet and high rate of water transmission, mainly deep, well-drained sands or gravelly sands. Group B consists of soils having a moderate infiltration rate when thoroughly wet, chiefly soils that have moderately fine to moderately coarse texture. Group C consists of soils having a slow infiltration rate when thoroughly wet, usually soils that have a layer impeding downward movement of water or soils of moderately fine to fine texture. Group D soils have a very slow infiltration rate (high runoff potential) when thoroughly wet, and are usually either clays with high shrink-swell potential, soils with a water table near the surface, and soils that have a relatively impervious layer near the soil surface.
[C] Whole soil K (Kw) factors vary from 0.02 to 0.69. The California State Water Resources Control Board defines low K values as values ranging from 0.05 to 0.2, moderate K values as those ranging from 0.25 to 0.45, and high K values ranging from 0.45 to 0.69.
[D] A restrictive layer" is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment.
n/a = not available
SOURCE: NRCS, 2015a.



SOURCE: NRCS, 2015

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Figure 4.5-4
Soils Map

Slope Stability

Slope failures, such as landslides, include many phenomena that involve the downslope displacement and movement of material, triggered either by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Exposed rock slopes undergo rockfalls, rockslides, or rock avalanches, while soil slopes experience soil slumps, rapid debris flows, and deep-seated rotational slides. Slope stability can depend on a number of complex variables, including the local geology, geologic structure, and amount of groundwater at the site, as well as external processes such as climate, topography, slope geometry, and human activity. The factors that contribute to slope movements include those that decrease the resistance in the slope materials and those that increase the stresses on the slope. Landslides can occur on slopes of 15 percent or less, but the probability is greater on steeper slopes that exhibit old landslide features such as scarps, slanted vegetation, and transverse ridges.

Landslides and slope instability are widespread throughout hillside areas of Ventura County (Ventura County, 2013). Existing landslides are subject to potential renewal of movement if triggered by poorly planned grading, earthquake motions (described in *Seismic Hazards*, above), or increases in ground moisture by any one of numerous factors including sewage disposal, irrigation, or rainfall. The California Geological Survey has mapped the slopes with the greatest relief within the project site, generally located northwest of Area IV and along the ridge in Areas I and II, as Generally Susceptible Areas, which are at or near their stability limits due to a combination of weaker materials and steeper slopes. Flanking these areas are Marginally Susceptible Areas, which are less likely to mobilize under natural conditions, but may change radically in response to modification of the adjacent terrain (Irvine, 1989). Soil slip susceptibility maps, which identify the natural slopes most likely to be the sites of soil slips during periods of intense winter rainfall, have also been created for an area including the project site. Soil slips pose relatively little hazard at the sites of initial failure, but the debris flows that form from them can be a hazard to people and facilities in their flow paths (USGS, 2003). The rocks and soils at the project site range from low to moderate susceptibility. Most of the debris flows mapped in the hills northwest of Burro Flats traveled either down dip or along valleys that drain to the northwest, away from the project site (Irvine, 1989).

Expansive Soils

Expansive soils contain significant amounts of clay particles that have the ability to give up water (shrink) or take on water (swell). When these soils swell, the change in volume can exert significant pressures on loads that are placed on them, such as loads resulting from building and facility foundations or underground utilities, and can result in structural distress and/or damage. Often, grading, site preparations, and backfill operations associated with subsurface facilities can eliminate the potential for expansion. Linear extensibility is used to determine the linear expansion or shrink-swell potential of soils. If linear extensibility is greater than 3 percent (classified as Moderate potential), shrinking and swelling can cause damage to buildings, roads, and other facilities (NRCS, 2015b). Over half of the project site contains little or no soil (mapped as SnG; rock), and thus no soil expansion behavior is expected over half of the project site. The Los Osos clay (LoE2), mapped in a small portion of the project site along the western boundary, has high soil expansion potential. Soil units with moderate soil expansion potential include the

Linne silty clay loam (LeE2), the Soper gravelly clay loam (SvF2), and the Zamora clay loam (ZmD2). Soils exhibiting high or moderate soil expansion potential cover approximately 4 percent of the project site area, located primarily in the western corner of the site underlying the Burro Flats area.

The California Building Code directs that expansive soil tendency be evaluated using the Soil Expansion Potential test (ASTM D-4829). This test evaluates the texture of a soil and how much a sample of the soil expands when wetted to a certain percentage of saturation. The value resulting from this test is called the expansion index, which correlates with expansion potential, ranging from very low potential to very high potential.

Collapsible Soils

Collapsible soils are soils that compact and collapse after they get wet. This can occur when the soil particles are loosely packed. Once water has filled the pores of the loosely packed soil, the soil particles become buoyant and then sink, causing a reduction in the overall soil volume. The amount of collapse (or reduction in volume) depends upon how loosely the soil particles were packed and the thickness of the soil. Collapsible soils tend to form in drier climates at valley margins where alluvium is deposited by streams due to the change in topography or where wind-blown sediments are deposited (these sediments are called loess). Collapsible soils are not identified as hazards in the Ventura County General Plan and the texture of soils at the project site indicate that the potential for soils to collapse is unlikely. Generally, collapsible soils are found in regions which are more arid than the project site area.

Soil Corrosion

Corrosion is the deterioration of a metal, concrete, or other material through a reaction with its environment. The corrosivity of soils is commonly related to several key parameters, including soil resistivity, the presence of chlorides and sulfates, oxygen content, and pH. Typically, the most corrosive soils are those with the lowest pH and highest concentration of chlorides and sulfates. Wet/dry conditions can result in a concentration of chlorides and sulfates as well as their movement in the soil, both of which tend to break down the protective corrosion films and coatings on the surfaces of building materials. High-sulfate soils are corrosive to concrete and may prevent complete curing, reducing its strength considerably. Low pH and/or low-resistivity soils can corrode buried or partially buried metal facilities. Depending on the degree of corrosivity of the subsurface soils, concrete, reinforcing steel, and bare-metal facilities exposed to these soils can deteriorate, eventually leading to structural failures. Soils at the project site range from low corrosivity potential to high corrosivity potential, with most soils in the low to moderate range. The unweathered bedrock present at the ground surface of over half of the project site has no corrosion rating. The Los Osos clay loam, in a small (3-acre) area along the southwestern boundary of the site, has a high steel corrosivity rating. The other soils at the project site have a moderate or low steel corrosivity rating and a moderate or low concrete corrosivity rating.

Subsidence

Land subsidence is the gradual settling or sudden sinking of the earth's surface due to subsurface movement of earth materials (USGS, 1999). Compaction of subsurface water-containing geologic layers is the primary cause of land subsidence. Regional ground subsidence is typically caused by compaction as a result of petroleum or groundwater withdrawal. The soil compacts because the water or petroleum formerly in the pore spaces of sediments or rock is partially responsible for holding the ground up. Loss of this support when the liquid is withdrawn results in consolidation or settlement of the underlying soils. Local subsidence or settlement may also occur when areas containing compressible soils are subjected to foundation or fill loads. Subsidence typically occurs in fine-grained materials (clays and silts); coarse-grained units (sands and gravel) are less susceptible because the sand and gravel provide a skeletal support structure that limits compaction. Subsidence has historically occurred in the Oxnard Plain and along the Santa Clara River in southern Ventura County; however, the project site is not located within a subsidence hazard area mapped by Ventura County (Ventura County, 2013).

4.5.2 Regulatory Setting

4.5.2.1 Federal

Federal Occupational Safety and Health Administration Regulations

The Occupational Safety and Health Administration's (OSHA) Excavation and Trenching standard, Title 29 of the Code of Federal Regulations (CFR), Subpart 1926.650, covers requirements for excavation and trenching operations. OSHA requires that all excavations in which employees could potentially be exposed to cave-ins be protected by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area. These regulations apply to the proposed construction and trenching activities of the project.

4.5.2.2 State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to facilities for human occupancy. In accordance with this act, the State Geologist established regulatory zones, called "earthquake fault zones," around the surface traces of active faults and published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace, because many active faults are complex and consist of more than one branch. There is the potential for ground surface rupture along any of the branches.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate "zones of required investigation" (i.e., seismic hazard zones) where site investigations are required to determine the need for mitigation of potential liquefaction and/or earthquake-induced landslide ground displacements. Cities and counties shall require, prior to the approval of a project located in a seismic hazard zone, a geotechnical report defining and delineating any seismic hazard. Cities and counties can establish policies and criteria which are stricter than those established by this act.

California Building Code

The California Building Code (CBC), which is codified in Title 24 of the California Code of Regulations, Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards related to structural strength, egress facilities, and general building stability. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all building and facilities within its jurisdiction. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under State law, all building standards must be centralized in Title 24 or they are not enforceable. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

Chapter 18 of the CBC covers the requirements of geotechnical investigations (Section 1803), including excavation, grading, and fills (Section 1804). Chapter 18 also describes analysis of expansive soils and the determination of the depth to groundwater table. Previously, the Thresholds of Significance in Appendix G of the CEQA Guidelines stated that expansive soil would be characterized as defined in Table 18-1-B of the 1994 Uniform Building Code. However, that table is no longer used and the current CBC definition is as follows:

> **1803.5.3 Expansive Soil.** In areas likely to have expansive soil, the building official shall require soil tests to determine where such soils do exist. Soils meeting all four of the following provisions shall be considered expansive, except that tests to show compliance with Items 1, 2 and 3 shall not be required if the test prescribed in Item 4 is conducted:
>
> 1. Plasticity index (PI) of 15 or greater, determined in accordance with ASTM D 4318;
> 2. More than 10 percent of the soil particles pass a No. 200 sieve (75 micrometers), determined in accordance with ASTM D 422;
> 3. More than 10 percent of the soil particles are less than 5 micrometers in size, determined in accordance with ASTM D 422;
> 4. Expansion index greater than 20, determined in accordance with ASTM D 4829.

California Excavation Notification Requirements

California Government Code Section 4216 requires that construction contractors report a project that involves excavation at least two working days prior to breaking ground. This program allows owners of buried installations to identify and mark the location of its facilities before any nearby excavation projects commence. Adherence to this law by contractors of projects reduces the potential of inadvertent pipeline and utility damage and leaks.

California Health & Safety Code

The California Health and Safety Code§115700 includes laws that apply to the destruction or alteration of water wells. These laws include required safety specifications for inactive or abandoned wells and aim to prohibit the migration of pollutants and contaminants through inactive wells.

California Occupational Safety and Health Administration Regulations

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the work place. In California, the California Division of Occupational Safety and Health (Cal/OSHA) and the federal OSHA are the agencies responsible for ensuring worker safety in the workplace.

The OSHA Excavation and Trenching standard (29 CFR 1926.650), described above in Section 4.2.2.1, Federal Regulations, and California Government Code Section 4216 covers requirements for excavation and trenching operations, which are among the most hazardous construction activities. OSHA requires that all excavations in which employees could potentially be exposed to cave-ins be protected by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area. Cal/OSHA is the implementing agency for both state and federal OSHA standards.

NPDES Construction General Permit

NPDES Program, CWA Section 402

Under the CWA Section 402, the NPDES controls water pollution by regulating point sources of pollution to waters of the United States. The California State Water Resources Control Board administers the NPDES permit program in California.

Projects that disturb one or more acres of soil must obtain coverage under the state's NPDES General Permit for Discharges of Storm Water Associated with Construction Activity (NPDES Construction General Permit). A SWPPP must be developed and implemented for each project covered by the general permit. The SWPPP provides specific construction-related BMPs to prevent soil erosion and loss of topsoil. A SWPPP must be prepared before construction begins. The required components and best management practices commonly included in a SWPPP are described in greater detail in Section 4.8, *Hydrology and Water Quality,* of this PEIR.

4.5.2.3 Local

Ventura County General Plan

The Ventura County General Plan contains many policies designed to minimize the effects of geologic hazards and erosion. The policies relevant to the project are excerpted below.

> 2.1.2.3 Essential facilities shall be designed and constructed to resist forces generated by earthquakes, gravity, precipitation, fire, and winds.
>
> 2.2.2.5 Roads, streets, highways, utility conduits, and oil and gas pipelines, shall be planned to avoid crossing active faults where feasible. When such location is unavoidable, the design shall include measures to reduce the effects of any fault movement as much as possible.
>
> 2.7.2.1 Development in mapped landslide/mudslide hazard areas shall not be permitted unless adequate geotechnical engineering investigations are performed, and appropriate and sufficient safeguards are incorporated into the project design.
>
> 2.7.2.2 In landslide/mudslide hazard areas, there shall be no alteration of the land which is likely to increase the hazard, including concentration of water through drainage, irrigation or septic systems, removal of vegetative cover, and no undercutting of the bases of slopes or other improper grading methods.
>
> 2.7.2.3 Drainage plans that direct runoff and drainage away from slopes shall be required for construction in hillside areas.
>
> 2.8.2.1 Construction must conform to established standards of the Ventura County Building Code, adopted from the California Building Code.
>
> 2.8.2.2 A geotechnical report, prepared by a registered civil engineer and based upon adequate soil testing of the materials to be encountered at the sub-grade elevation, shall be submitted to the County Surveyor, Environmental Health Division, and Building and Safety for every applicable subdivision and Building Permit application (as required by the California Building Code).

Ventura County Building Code

Ventura County has adopted the updated California Building Code, with Ventura County Amendments, per Ordinance No, 4456. The Ventura County Building Code considers demolition a "construction activity" that must be approved by the County prior to proceeding. During review of construction documents submitted to obtain a building permit, the County evaluates the location of proposed construction activity with respect to physical features such as precipitous cliffs or other nearby vertical land masses of unknown stability, unstable soils or geologic conditions, and terrain subject to severe soil erosion.

Ventura County Grading Ordinance

The Ventura County Grading Ordinance includes ministerial standards for the proper conduct of grading, drainage improvement, and site development for Non-Development grading projects. All grading, drainage improvement, and site development is required to be conducted in a manner consistent with the requirements of the Grading Ordinance, regardless of whether or not a grading permit is required.

Ventura County Well Permits Ordinance

The Ventura County Well Permits Ordinance prohibits the construction, repair, modification, or destruction any cathodic protection well that is more than 50 feet deep, any engineering test hole that is more than 50 feet deep, any monitoring well, or any water well unless such work is done pursuant to and in compliance with an unexpired written permit for such work.

4.5.3 Thresholds of Significance

For the purposes of this PEIR, DTSC has based the thresholds of significance on the checklist questions regarding geologic resources in Appendix G of the CEQA Guidelines. In addition, Ventura County's Initial Study Assessment Guidelines have been incorporated, where appropriate, into the analysis. Please see Chapter 7.0, *Impacts Found Not to Be Significant*, of this PEIR, for a discussion of geologic resource issues that were found not to be significant and do not warrant detailed consideration.

Based on the size and scope of the project and the potential for impacts, the criteria identified below are included for evaluation in this PEIR.

Would the project:

4.5-1 Expose people or structures to potential substantial adverse effects including the risk of loss, injury, or death involving (refer to Impact Statements 4.5-1a and 4.5-1b);

- Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area, or based on other substantial evidence of a known fault?
- Strong seismic ground shaking?
- Seismic-related ground failure, including liquefaction and lateral spreading?
- Landslides?

4.5-2 Result in substantial soil erosion capable of causing significant property damage or the loss of useable topsoil (refer to Impact Statements 4.5-2a and 4.5-2b)?

4.5-3 Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in onsite or offsite landslides, lateral spreading, subsidence, or collapse (refer to Impact Statements 4.5-3a and 4.5-3b)?

4.5-4 Be located on problematic soils such as those characterized as expansive, as defined in 24 CCR 1803.5.3 of the California Building Code,[6] or corrosive (refer to Impact Statements 4.5-4a and 4.5-4b)?

4.5.4 Methodology

This impact section assesses potential impacts related to geology, seismicity, and soils based on the potential for the project to change geologic and soil conditions or expose facilities or people to unstable geologic conditions during project activities, using existing site conditions as a baseline for comparison. The potential for damage to proposed facilities or increased risk of injury due to geologic hazards is analyzed using available data from site-specific investigations, and existing publications and maps completed by state and federal agencies, such as the USGS, CGS, and United States Department of Agriculture. In addition, the severity and significance of geology and soils impacts are analyzed in the context of existing geologic and seismic hazard regulations and policies.

As noted in Chapter 3.0, *Project Description*, of this PEIR, any one or a combination of remedial activities and technologies could be used to achieve the objectives of the proposed project. Consequently, all proposed remedial activities and multiple remedial technologies are evaluated in this section at a programmatic level of detail. In addition, given that sufficient information is available regarding the initial activities proposed at the site, the following analysis also evaluates those initial activities at a project level of detail. The program- and project-level analyses are each discussed for all of the impacts identified in this PEIR.

For the purposes of analysis, construction activities would include the excavation of soils, restoration of disturbed areas, demolition and removal of facilities, and the construction of soil and groundwater treatment systems (e.g., soil vapor extraction systems, biotreatment systems, extraction wells, and groundwater treatment systems). These construction activities would represent relatively short-term events, although they would occur at various times spread out over time across the entire project site. Operations activities would include the operational phases of treatment technologies (e.g., soil vapor extraction, groundwater extraction and treatment, in situ or ex situ bioremediation, air sparging systems, etc.), but do not include soil excavation. In addition, the operations activities include the post-treatment monitoring activities conducted to verify that remedial objectives have been achieved.

4.5.5 Analysis of Project Impacts

The following text describes the potential environmental impacts related to geology, soils, and seismicity associated with implementing the overall site cleanup versus initial activities, demarcated as impact "a" and "b" respectively. As presented in *Section 3.7 Initial Activities*, of this PEIR, the initial activities include eight different projects. Depending on the degree to which

[6] The updated CBC no longer cites the 1997 UBC Table 18-1-B for identifying expansive soils. The checklist in Appendix G of the CEQA Guidelines still refers to this out-of-date table. This PEIR uses the updated CBC section as defined in 24 CCR 1803.5.3 of the California Building Code.

impacts of the initial activities would be similar to or different from each other, the impact analysis for the initial activities for some thresholds has been combined accordingly (i.e., the number of separate discussions for impact for each threshold ranges from one to eight). Following each potential impact is a significance determination for each potential impact.

4.5.5.1 Earthquake Faults, Seismic Events, and Landslides

Program Assessment

Impact 4.5-1a: Would implementation of the **overall site cleanup** result in the exposure of people or structures to potential substantial adverse effects including the risk of loss, injury, or death involving:

- Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?
- Strong seismic ground shaking?
- Seismic-related ground failure, including liquefaction?
- Landslides?

Overall Site Cleanup (Impact 4.5-1a)

The investigative process to date has determined that various remedial approaches and treatment technologies would be appropriate to clean up affected soil and groundwater at the project site. The differing remedial technologies are due to the ranging conditions (hydrogeology, topography, vegetation, access, sensitive biological and cultural resources, etc.) where multiple affected media are adversely affected by a wide variety of chemicals and radionuclides of concern.

As described in Section 4.5.1, *Environmental Setting*, none of the project activities at the project site would occur within an active fault rupture zone as delineated by the State Geologist. While the project site is located in a seismically active area and there is no guarantee that fault rupture would only occur in areas demonstrating evidence of past faulting, rupture on faults not identified as active is expected to be less likely (Bryant and Hart, 2007). Therefore, the risk of the project exposing people or structures to loss, injury, or death involving rupture of an earthquake fault would be less than significant and is not discussed further in the sections below.

As discussed above, there are 11 active or potentially active faults located within 35 miles of the project site. As shown on Figure 4.5-2, the active Simi-Santa Rosa Fault Zone is located about four miles north of the project site and the potentially active Chatsworth Fault is located along the south side of the project site. There is a potential for high-intensity ground shaking associated with a characteristic earthquake in this region. The intensity of such an event would depend on the causative fault and the distance to the epicenter, the moment magnitude, the duration of shaking, and the nature of the geologic materials on which the project activities would occur. Intense ground shaking and high ground accelerations would affect the entire area around the proposed soil and groundwater treatment facilities and associated pipelines. The primary and secondary effects of ground shaking could damage structural foundations, induce ground failure

(e.g., landslides), distort or break pipelines and other water conveyance facilities, and cause structural failure.

The impacts of seismic shaking at the project site during project activities would be minimized by implementing the recommendations of the geotechnical investigations prepared for the project as required by the Seismic Hazards Mapping Act and Mitigation Measure GEO-1, which would require site-specific geotechnical investigations that include specific recommendations to reduce the potential physical hazards associated with strong seismic ground shaking. For example, the required geotechnical investigations would include recommendations for the final slope configurations of excavated areas and the identification of problematic soils (e.g., liquefaction) to reduce the potential for seismically induced slope and ground failures of unstable soils. Liquefaction and unstable soil are further discussed below.

The initiation of seismically related ground failure such as liquefaction could occur, but is unlikely at the site, as the area is not characterized by the presence of deep sediments and/or shallow groundwater. The area is not mapped as being at risk for seismically induced ground failure such as liquefaction by the State or by Ventura County. The bedrock of the Chatsworth Formation is present at or within five feet of the ground surface throughout much of the project site. The type of material at the project site is not expected to liquefy during an earthquake; while alluvium greater than five feet thick is present in the valleys of the site, overall site cleanup would not add water in excess of existing amounts to the alluvium, and excavation along with partial backfilling and grading would replace removed alluvium with clean compacted fill. The potential of placing project workers, equipment, or facilities on liquefiable material is thus very low, and any risk that the project would expose structures or humans to loss or injury from seismically induced ground failure would be less than significant. As discussed above, the risk of exposure to seismically induced liquefaction hazard during overall site cleanup would be reduced by implementing the recommendations from geotechnical investigations required by the Seismic Hazards Mapping Act and Mitigation Measure GEO-1. Such geotechnical recommendations may include but would not be limited to removing or treating the liquefiable soils. In cases where the liquefiable soil unit is relatively thin, the unit could be excavated and replaced with fill or soil that is not liquefiable. Alternately, the liquefiable soil could be treated in place using various soil compaction techniques such as vibro-compaction (compaction of the soil by depth vibrators) or dynamic compaction (compaction by dropping a heavy weight repeatedly on the ground at regularly spaced intervals). These methods result in the densification of soil and enable structures to withstand soil liquefaction.

Cleanup activity and treatment system installation (e.g., soil vapor and groundwater treatment systems, soil vapor extraction wells, associated pipelines) would occur within or adjacent to areas mapped by the CGS as susceptible to seismically induced landslides (shown on Figure 4.5-3). An earthquake could initiate movement of earth materials located upslope of excavations or treatment facilities at the project site. However, adherence to sound grading practices (such as bracing or underpinning of excavated faces and installation of protective barriers to stop and contain falling earthen material) as required by OSHA regulations would reduce the potential for injury or structural damage as a result of seismically induced landslides during excavation activities. In

addition, site-specific engineering and geotechnical recommendations addressing slope stability and grading would be prepared for remediation activities at the site as required by the Seismic Hazards Mapping Act and Mitigation Measure GEO-1. Placement and compaction of fill would also be addressed by geotechnical recommendations for all remediation activities. Geotechnical analysis would be conducted to determine the potential for fault rupture, liquefaction, settlement, lateral spreading, landsliding, and other geologic hazards. Remediation activities would then be designed in accordance with the geotechnical analyses. In addition, steeply sloping disturbed material would be protected with sheeting or tarps prior to rain events in accordance with water quality control measures as required in Mitigation Measure HYDRO-1, which would minimize the potential for landsliding.

Implementation of the soil and groundwater remediation systems could involve the installation of facilities that would be operated over varying time frames. The geotechnical investigations prepared for each cleanup area, as required by the Seismic Hazards Mapping Act (and Mitigation Measure GEO-1) recommends structural features needed to minimize seismic damage to the treatment system infrastructure (infrastructure for the soil vapor extraction, in situ biotreatment, ex situ biotreatment, and groundwater treatment systems). In addition, the operation and maintenance of the non-excavation remedies and treatment systems would include contingency plans in the event of a significant seismic event.

With implementation of Mitigation Measures GEO-1 and HYDRO-1, the project would include site-specific engineering measures to minimize risks associated with seismic hazards, including slope stability and landsliding, as well as measures specifically addressing slope stability regardless of the source of destabilizing force. With implementation of Mitigation Measure GEO-1, overall site cleanup would include geotechnical recommendations for placement and compaction of fill material that would result in long-term stability of slopes. These features would reduce risks associated with exposure to seismically induced landsliding to less-than-significant levels. See Impact 4.5-3, below, for discussion of the impact of the project on landslides not induced by seismic ground shaking.

> Conclusion: Overall site cleanup would place people and facilities in an area that could experience strong seismic ground shaking or seismically induced ground failures (e.g., landslides). However, implementation of Mitigation Measures GEO-1 and HYDRO-1 and compliance with building code requirements, the Seismic Hazards Mapping Act, and OSHA regulations would ensure that implementation of overall site cleanup activities are such that the risk of loss, injury, or death from seismicity during project implementation would be less than significant with mitigation incorporated.

Impact 4.5-1a Determination: *The* ***overall site cleanup*** *would place people and soil and groundwater treatment system structures in an area that could experience strong seismic ground shaking or seismically induced ground failures (e.g., landslides). However, implementation of Mitigation Measures GEO-1 and HYDRO-1 and compliance with building code requirements, the Seismic Hazards Mapping Act, and OSHA regulations would ensure that implementation of overall site cleanup activities are such that impacts related to the risk of loss, injury, or death from seismicity during project implementation would be* ***less than significant with mitigation incorporated****.*

Initial Project Assessment

Impact 4.5-1b: Would implementation of the **initial activities** result in the exposure of people or structures to potential substantial adverse effects including the risk of loss, injury, or death involving:

- Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?
- Strong seismic shaking?
- Seismic-related ground failure, including liquefaction?
- Landslides?

Initial Activities (Impact 4.5-1b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

As discussed previously for the impacts of overall site cleanup, there are no fault rupture zones within the project site. All initial activities are located within the project site and thus would be subjected to the same level of seismic activity and risks as described previously for the overall site cleanup. Therefore, with implementation of Mitigation Measure GEO-1, which requires a geotechnical evaluation, and Mitigation Measure HYDRO-1, which requires a SWPPP, and compliance with building code requirements, the Seismic Hazards Mapping Act, and OSHA

regulations impacts from the eight initial activities would also be less than significant with mitigation incorporated.

> Conclusion: The eight initial activities would place people and structures in an area that could experience strong seismic ground shaking or seismically induced ground failures. However, with implementation of Mitigation Measures GEO-1 and HYDRO-1 and compliance with building code requirements, the Seismic Hazards Mapping Act, and OSHA regulations, the DOE and NASA initial activities would be designed such that the risk of loss, injury, or death from seismicity during cleanup would be less than significant with mitigation incorporated.

Impact 4.5-1b Determination: *The **initial activities** would result in the exposure of people or structures to potential substantial adverse effects including the risk of loss, injury or death involving rupture of a known earthquake fault, strong seismic shaking, or seismic-related ground failure, including liquefaction; or landslides. However, implementation of Mitigation Measures GEO-1 and HYDRO-1 and compliance with building code requirements, the Seismic Hazards Mapping Act, and OSHA regulations would ensure that implementation of the initial activities are such that impacts related to the risk of loss, injury, or death from seismicity during project implementation would be **less than significant with mitigation incorporated**.*

4.5.5.2 Soil Erosion or Loss of Topsoil

Program Assessment

Impact 4.5-2a: Would implementation of the **overall site cleanup** result in substantial soil erosion or the loss of topsoil?

Overall Site Cleanup (Impact 4.5-2a)

Overall site cleanup could involve many activities that disturb soil, and could result in substantial soil erosion. The technologies that would disturb soil include soil and bedrock excavation and disposal, ex situ bioremediation, in situ bioremediation, soil stabilization (as excavation would be required prior to addition of chemicals), soil vapor extraction, and soil washing/partitioning (also would require excavation prior to utilizing this technology). These technologies may require one or more of the following soil-disturbing activities: vegetation removal and grubbing; soil excavation; bedrock removal; stockpiling soil for later reuse, disposal, or treatment; backfilling excavated areas; and grading to return site topography to natural drainage conditions.

If left unprotected, construction sites can erode at rates in excess of one hundred times the natural background rate of erosion (CASQA, 2003). Erosion of disturbed soil at construction sites occurs through rainfall impact, sheet erosion (water flowing in a thin sheet across the soil surface), rill and gully erosion (grooves cut in the soil surface by water moving across the surface, can be one hundred times more effective at eroding soil than sheet flow), and stream and channel erosion. Erosion by wind also occurs at construction sites. Land clearing and grubbing, excavation and

other earthwork, drilling and blasting, materials handling (such as moving material to stockpiles), and demolition and debris disposal can all expose soil to erosion by wind.

However, due to the imperative to contain existing contaminated soil and water at the project site, overall site cleanup includes compliance with regulations and implementation of mitigation measures that would minimize erosion. To limit erosion, BMPs would be based on minimizing disturbed areas, stabilizing disturbed areas, and protecting slopes and channels. Due to the extent of soil disturbance required for the project, coverage under the California SWRCB General Permit for Storm Water Discharges Associated with Construction Activity Order Number 2009-0009-DWQ (the Construction General Permit) would be required. Development and implementation of a SWPPP would be required to obtain coverage under this permit. In accordance with Mitigation Measure HYDRO-1, a SWPPP would be developed incorporating sediment control BMPs designed to limit the amount of soil eroded by water.

Typical construction BMPs include scheduling or limiting activities within streambeds to certain times of the year; installing sediment barriers such as silt fences and fiber rolls along the perimeter of the construction area; maintaining equipment and vehicles used for construction; methods to control the tracking of soil by construction vehicles; and developing and implementing a spill prevention and cleanup plan. Erosion control and soil management BMPs include: silt fences, sand bags, straw waddles, fiber rolls, stockpile management, dewatering runoff controls, soil binders, erosion mats, check dams, gabion walls, and the use of protective sheeting or tarps prior to a rain event on steep slopes. In addition, Mitigation Measure AQ-4 requires a soil management plan that would be prepared in compliance with VCAPCD rules, and would protect soil from wind erosion The soil management plan would also include many of the BMPs described in the SWPPP and mitigation measures. Mitigation Measure BIO-5 requires a revegetation plan that would ensure that disturbed areas are revegetated to prevent erosion. Also, Mitigation Measure GEO-1 requires a geotechnical evaluation which would include project-specific measures to reduce the potential physical hazards associated earthwork-related conditions during construction. Geotechnical measures to address slope-related unstable soils could include removal of relatively small volumes, installation of shoring, or stabilization techniques, such as described in Mitigation Measure BIO-5.

Compliance with regulations and implementation of mitigation measures would limit the duration of exposed disturbed soil conditions, limit the duration of exposure to erosive forces by vegetating areas that sustained plant cover prior to overall site cleanup, protect disturbed materials from wind erosion by stabilizing them or limiting the extent of disturbance, protect disturbed materials from water erosion using multiple techniques that limit the extent of soil exposure in space and time and stabilize the soil, and protect slopes and channels by grading in ways that reflect natural contours.

In addition to the measures required during cleanup, the SWPPP would also require implementation of post-cleanup BMPs that would restore previous topographic grades and slopes at the worksite to facilitate revegetation, and minimize long-term erosion problems and the impacts of loss of topsoil. In addition to the measures required during cleanup by the SWPPP

(HYDRO-1), native vegetation on disturbed areas that were previously vegetated would be replaced (Mitigation Measure BIO-5). Additionally, excavation areas would be backfilled and contoured to mimic natural drainage patterns.

> Conclusion: The overall site cleanup would require extensive soil disturbance over select areas of the site during the short term, however, implementation of Mitigation Measures AQ-4, BIO-5, GEO-1, and HYDRO-1 would control erosion and soil loss at the work sites resulting in a less than significant impact with mitigation incorporated.

Impact 4.5-2a Determination: *The* ***overall site cleanup*** *would require extensive soil disturbance over select areas of the site during the short term, however, implementation of Mitigation Measures AQ-4, BIO-5, GEO-1, and HYDRO-1 would control erosion and soil loss at the work sites resulting in a* ***less than significant impact with mitigation incorporated****.*

Initial Project Assessment

Impact 4.5-2b: Would implementation of the **initial activities** result in substantial soil erosion or the loss of topsoil?

Initial Activities (Impact 4.5-2b)

This discussion addresses the two initial excavation projects described in Section 3.7, *Initial Activities*:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant

DOE and NASA would each implement initial activities consisting of soil excavation and offsite disposal, as described in Section 3.7 and summarized under Impact 4.5-1b.

The excavation of contaminated soils under this initial project would represent the time period of highest potential for exposing soils, both clean and contaminated, to potential sedimentation and erosion. If not managed appropriately, excavation could result in extensive soil erosion.

As discussed previously for the impacts of overall site cleanup, all excavation and earthwork activities would be completed in accordance with the soil handling protocols and BMPs described in DTSC-approved cleanup decision documents and the SWPPP required by Mitigation Measure HYDRO-1 and the Construction General Permit, along with Mitigation Measures AQ-4, BIO-5, and GEO-1 to further manage ground disturbing activities in a manner that would minimize erosion.

Following completion of soil removal, depending on the depth of excavation, the excavated areas would be partially backfilled with clean soil and regraded in accordance with the cleanup decision documents. The regraded areas would be seeded with native vegetation (Mitigation Measure BIO-5) and treated with soil stabilization measures where necessary to minimize erosion of

exposed soils (Mitigation Measure GEO-1). Once earthwork activities are complete, the excavated areas would be stabilized in accordance with the cleanup decision documents and monitored for effectiveness to ensure that the potential for erosion is minimized.

> Conclusion: The DOE and NASA initial activities would involve substantive earthwork activities that could result in erosion or loss of topsoil. However, implementation of Construction General Permit, OSHA excavation requirements and Mitigation Measures AQ-4, BIO-5, GEO-1, and HYDRO-1 would ensure impacts related to erosion and soil loss would be less than significant with mitigation incorporated.

DOE Building Demolition Activities (Impact 4.5-2b)

As discussed in Section 3.7.3, DOE onsite demolition activities would include demolishing buildings and features using standard construction equipment and demolition techniques, followed by placing the demolition areas in a safe and stable configuration (to minimize erosion and safety hazards) to facilitate later soil characterization and remediation. Implementation of this project would also include removal of subsurface vaults under two of the buildings followed by backfilling and/or stabilization of the void space left by the vaults. Soil handling may be necessary to facilitate removal of the vaults and/or building slabs.

Removal of the buildings themselves and demolition and debris disposal can all expose soil to erosion. The onsite demolition activities would expose soil to erosion during demolition, excavation, and material stockpiling that must be addressed during the safe and stable configuration.

Prior to demolition and excavation, demolition permits and grading permits (for the soil disturbance) would be secured from Ventura County. During review of construction documents submitted to obtain building and grading permits, Ventura County would evaluate the location of proposed cleanup activity with respect to physical features such as slopes or other nearby land masses of unknown stability, unstable soils or geologic conditions, and terrain subject to soil erosion. Compliance with the County and OSHA excavation regulations would ensure impacts would be less than significant.

In addition, the potential for the excavation portion of these demolition activities to increase soil instability and result in onsite or offsite soil mobilization would be minimized by the specific earthwork-related protective measures in the required geotechnical investigation recommendations (Mitigation Measure GEO-1). Stockpiles and debris piles would be secured per the SWPPP required by the Construction General Permit and Mitigation Measure HYDRO-1. In addition, Mitigation Measure AQ-4 requires a soil management plan that would be prepared in compliance with VCAPCD rules, and would protect soil from wind erosion. Mitigation Measure BIO-5 requires a revegetation plan that would ensure that disturbed areas are revegetated to prevent erosion. Additionally, excavation areas would be backfilled and contoured to mimic natural drainage patterns.

During the safe and stable configuration stage, all demolition sites would be secured to prevent contaminant release, which would include minimizing the transport of sediment via wind or

water. As a condition of coverage under the Construction General Permit, post-cleanup BMPs must be implemented that minimize the release of pollutants, including sediment, into stormwater (also required under Mitigation Measure HYDRO-1). These post-cleanup BMPs would minimize the potential for onsite erosion or the transport of soil offsite during the safe and stable configuration stage.

> Conclusion: DOE demolition activities would comply with the Construction General Permit, OSHA excavation requirements and Mitigation Measures AQ-4, BIO-5, GEO-1, and HYDRO-1which would ensure that impacts related to erosion and soil loss would be less than significant with mitigation incorporated.

RCRA Post-Closure and Hazardous Waste Facility Closure

This discussion addresses the five closure projects described in Section 3.7.4, *RCRA Post-Closure and Hazardous Waste Facility Closure*:

- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

Thermal Treatment Facility Closure (Impact 4.5-2b)

The TTF closure project would include additional sampling, excavation, and disposal of about 300 CY of in situ soil and potentially some concrete debris at an offsite RCRA permitted disposal facility, followed by confirmation sampling and restoration. The methods proposed for the TTF closure are similar to those of the overall site cleanup described previously. The cleanup goals for the closure are required to comply with the 2007 Consent Order, (see Section 2.2.3, *Regulatory History*, of this PEIR). Excavated areas would be restored so that the drainage pattern in the area would be similar to the pre-excavation condition by backfilling and recontouring the area. Vegetated areas, if any, would be reseeded.

The Construction General Permit would require the implementation of a SWPPP (Mitigation Measure HYDRO-1), which would include BMPs that would ensure that impacts related to erosion and soil loss would be less than significant. In addition, impacts would be controlled by the implementation of the DTSC-approved closure plan discussed previously and the Soil management plan (Mitigation Measure AQ-4). Mitigation Measure BIO-5 requires a revegetation plan that would ensure that disturbed areas are revegetated to prevent erosion. Additionally, excavation areas would be backfilled and contoured to mimic natural drainage patterns.

> Conclusion: All excavation work for the TTF project would be completed in compliance with the DTSC-approved closure plan, Construction General Permit, OSHA excavation requirements and Mitigation Measures AQ-4, BIO-5, GEO-1, and HYDRO-1 which would ensure that impacts related to erosion and soil loss would be less than significant with mitigation incorporated.

Radioactive Materials Handling Facility Closure and Hazardous Waste Management Facility Closure (Impact 4.5-2b)

The RMHF and HWMF closure projects would involve decontamination and demolition of the physical features (building debris consisting of concrete, steel, other building materials and appurtenances) remaining at each site. As discussed previously for the impacts of overall site cleanup and similar to the demolition activities, all closure activities would be completed in accordance with DTSC-approved closure plans and the SWPPPs required by the Construction General Permit. The closure plans would describe the existing conditions including the facilities to be demolished; testing, decontamination, and handling procedures; performance standards, and safety measures. Compliance with the closure plans and Mitigation Measures BIO-5, AQ-4, GEO-1, and HYDRO-1 would ensure that impacts related to erosion and soil loss would be less than significant with mitigation incorporated.

During the safe and stable configuration stage, the demolition sites would be secured to prevent contaminant release, which would include limiting the transport of sediment via wind or water. As a condition of coverage under the Construction General Permit, post-construction BMPs must be implemented that minimize the release of pollutants, including sediment, into stormwater. These post-construction BMPs would minimize the potential for onsite erosion or the transport of soil offsite during the safe and stable configuration stage.

> Conclusion: The closure activities would require soil disturbance, however, compliance with the closure plans and the implementation of Mitigation Measures AQ-4, BIO-5, GEO-1, and HYDRO-1would control erosion and soil loss at the work sites resulting in a less-than-significant impact with mitigation incorporated.

Areas I, II, and III Impoundment Post-Closure (Impact 4.5-2b)

Impoundment maintenance would involve up to three workers driving to the sites in light trucks, checking impoundment cover integrity and existing concrete diversion channels to ensure they are effective and minimizing run-on or run-off and performing minor maintenance on an as needed basis. Such activities would involve only minimal ground disturbance and therefore would not result in erosion or loss of topsoil. The purpose of the impoundments is to maintain soil stability and minimize infiltration and monitoring and maintenance would be performed to ensure the impoundments are functioning correctly.

> Conclusion: The proposed monitoring and maintenance activities for the Areas I, II, and III Impoundment Post-Closure projects would maintain soil stability and water quality, and would not significantly alter existing conditions at the site. The extent of soil exposure and alterations to drainage patterns as a result of the project would be less than significant.

Impact 4.5-2b Determination: *The* ***initial activities*** *would require extensive soil disturbance over select areas of the site during the short term, however, implementation of Mitigation Measures AQ-4, BIO-5, GEO-1, and HYDRO-1 would control erosion and soil loss at the work sites resulting in a* ***less than significant impact with mitigation incorporated****.*

4.5.5.3 Unstable Soils

Program Assessment

Impact 4.5-3a: Would the **overall site cleanup** be located on a geologic unit that is unstable or includes soil that is unstable, or that would become unstable as a result of project implementation, and result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?

Overall Site Cleanup (Impact 4.5-3a)

Geologic units at the site could be destabilized by overall site cleanup. As described previously in Section 4.5.1, landslides and slope instability are widespread throughout hillside areas of Ventura County. The hillside areas of the project site are mapped as either Generally Susceptible or Marginally Susceptible to landsliding. Overall site cleanup activities that modify terrain adjacent to or within Marginally Susceptible Areas or Generally Susceptible Areas could result in landsliding. While the areas in which excavation and other earthmoving activities that would occur are mapped as generally exhibiting low susceptibility for ground failure, heavy rainfall, poorly planned grading, or other changes to the topography of the area could mobilize soils at the project site (project impacts related to seismically induced landsliding and liquefaction are discussed in Impact 4.5-1, above). Ventura County also has experienced destructive landslides as a result of the indiscriminate modification of sloping ground or creation of cut and/or fill slopes in susceptible areas (Ventura County, 2013).

Grading and excavations associated with access roads, construction staging areas, soil and groundwater treatment, and backfilling and site restoration, if improperly performed, could create unstable conditions or worsen existing landslide risks. Cuts into hillsides could remove material that is needed to support the upland material, and road or staging area fills could slough, slump, or ravel if they result in over-steepened slopes.

Adherence to sound grading practices (such as bracing or underpinning of excavated faces), as required by OSHA regulations would generally ensure that construction activities would not create new areas of instability. In addition, implementation of the BMPs in the SWPPP required by the Construction General Permit and multiple mitigation measures would limit water infiltration into soil stockpiles or excavated areas and would minimize creation of unstable conditions. Stockpiled material would be covered with non-toxic dust suppressants or tarps in accordance with Mitigation Measure AQ-4. Geotechnical recommendations and site-specific design measures developed to address slope stability, grading, excavation characteristics, and placement and compaction of fill would be incorporated in the project as required by the Seismic Hazards Mapping Act and Mitigation Measure GEO-1. Unstable soils are earth materials that, because of their nature or the influence of related conditions, cannot be depended upon to remain in place without treatment or extra support. Example measures that may be included in the geotechnical evaluation to address liquefiable soils are discussed above. Unstable soils also include soils on slopes susceptible to slope failure. Geotechnical measures to address slope-related unstable soils could include removal of relatively small volumes, installation of shoring,

or stabilization techniques, such as described in Mitigation Measure BIO-5. Protection of steeply sloping disturbed material prior to rain events in accordance with SWPPP BMPs (Mitigation Measure HYDRO-1) would also limit the impact of the project on soil stability. Areas where new facilities are required would be sloped, and compacted if necessary, to reduce the possibility of slope failure.

Subsidence of the ground surface has not been observed in the project area because the soil across the project site is generally coarse-grained making the soil units less susceptible to subsidence. In addition, there is limited saturated soil present and groundwater onsite is within fractured bedrock, which is also less susceptible to subsidence. Historically, up to 304 gpm were pumped from water supply wells onsite and no onsite subsidence was reported (MWH, 2009). As described in Section 4.5.1, no collapsible soils have been mapped at the project site, and no materials exhibiting collapsible soil properties have been identified at the project site. Geotechnical recommendations for the suitability of imported soil to use as fill and the placement and compaction of fill material would identify fill material types and compaction levels that limit soil instability (Mitigation Measure GEO-1).

The long-term stability of geologic materials at the site would be affected by the type and compaction of material used to backfill the excavated areas and the topography of the site after remedial activities are completed. If fill materials are not adequately compacted, or are not cohesive, then the project could increase the potential for onsite or offsite landsliding or collapse. Poorly planned cut-and-fill or other changes to site topography resulting from the project could also mobilize otherwise stable soil. The project includes mitigation measures addressing both of these issues. Geotechnical recommendations and site-specific design measures developed to address grading, suitability of imported soil, and placement and compaction of fill in order to ensure the fill would stable would be incorporated in the project (Mitigation Measure GEO-1). With implementation of Mitigation Measure BIO-5, areas that supported vegetation before the project would be replanted, further protecting soil from mobilization over the long-term.

> Conclusion: Overall site cleanup would excavate material in an area mapped as susceptible to landsliding; however, with implementation of Mitigation Measures GEO-1, BIO-5, HYDRO-1 and AQ-4, this impact would be less than significant with mitigation incorporated.

***Impact Determination 4.5-3a**: The **overall site cleanup** would result in conducting activities or placing structures on unstable geologic units or units that would become unstable as a result of project activities. With implementation of Mitigation Measures GEO-1, BIO-5, HYDRO-1, and AQ-4 this impact would be **less than significant with mitigation incorporated**.*

Initial Project Assessment

Impact 4.5-3b: Would the **initial activities** be located on a geologic unit that is unstable or includes soil that is unstable, or that would become unstable as a result of project implementation, and result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?

Initial Activities (Impact 4.5-3b)

This discussion addresses the two initial excavation projects described in Section 3.7, *Initial Activities*:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant

DOE and NASA would each implement initial activities consisting of soil excavation and offsite disposal, as described in Section 3.7 and summarized under Impact 4.5-1b. As discussed previously for the impacts of overall site cleanup, all excavation activities would be completed in accordance with the SWPPP (Mitigation Measure HYDRO-1) required by the Construction General Permit and OSHA excavation requirements. Implementation of these agency required protocols would ensure that impacts related to unstable soil would be less than significant. In addition, the DOE and NASA initial activities would implement the soil handling protocols and BMPs described in DTSC-approved cleanup decision documents, and Mitigation Measures, AQ-4, BIO-5, and GEO-1 to further reduce impacts.

Following completion of soil removal, depending on the depth of excavation, the excavated areas would be backfilled with clean soil and regraded in accordance with the cleanup decision documents. The regraded areas would be seeded with native vegetation (Mitigation Measure BIO-5) and given added soil stabilization measures where necessary to ensure that exposed soils are not susceptible to erosion (Mitigation Measure GEO-1). Once earthwork activities are complete, the excavated areas would be stabilized in accordance with the cleanup decision documents and monitored for effectiveness to ensure that the potential for erosion is minimized.

> Conclusion: The DOE and NASA initial activities would alter topography in areas that are susceptible to slope instability. However, with implementation of Mitigation Measures GEO-1, AQ-4, BIO-5, and HYDRO-1, this impact would be less than significant with mitigation incorporated.

DOE Building Demolition Activities (Impact 4.5-3b)

As discussed in Section 3.7.3, DOE demolition activities would include demolishing 24 buildings and other built environment resources using standard construction equipment and demolition techniques, followed by placing the demolition areas in a safe and stable configuration to facilitate later soil characterization and remediation. Implementation of this project would also include excavation to remove subsurface vaults under two of the buildings followed by backfilling and/or stabilization of the vault excavation area prior to placing the sites into safe and stable conditions.

The built environment resources to be demolished are predominantly located in the relatively flat Burro Flats area, within which the land would likely remain stable unless the topography is radically modified. Demolition of buildings along the northwest edge of the Burro Flats area may modify materials marginally susceptible to landsliding. As described in the discussion of erosion impacts related to demolition in Impact 4.5-2b, this demolition activity would be required to secure building and grading permits from Ventura County. In compliance with the CBC and Mitigation Measure GEO-1, a geotechnical investigation report would be prepared to identify potential geotechnical issues and to provide specific recommendations to address those issues. During review of construction documents submitted to obtain a building permit, which would include the geotechnical investigation report, Ventura County would evaluate the locations of proposed construction activities with respect to physical features such as precipitous cliffs or other nearby vertical land masses of unknown stability, unstable soils or geologic conditions, and terrain subject to severe soil erosion. Therefore, compliance with the Ventura County regulations and the CBC would ensure that geotechnical investigation recommendations would be implemented to address project features and activities located on unstable geologic or soil units, or that would become unstable as a result of project implementation. In addition, Mitigation Measure BIO-5 requires that disturbed vegetated areas are revegetated, which would stabilize disturbed soils. Also, stockpiled material would be covered with non-toxic dust suppressants or tarps in accordance with Mitigation Measure AQ-4.

During the safe-and-stable configuration stage, the demolition sites would generally not be at risk for destabilizing soils because most of the sites are located on relatively flat topography. Regardless of topography, all of the sites would still be required to comply with the SWPPP post-construction BMPs (Mitigation Measure HYDRO-1) that minimize the potential for onsite erosion or the transport of soil off site during the safe-and-stable configuration stage.

> Conclusion: DOE demolition activities would generally occur in an area not susceptible to unstable ground conditions. The demolition activities would comply with the requirements of Ventura County permits, the CBC, and the Construction General Permit required SWPPP. With compliance with regulations and implementation of Mitigation Measures GEO-1, AQ-4, BIO-5, and HYDRO-1, this impact would be less than significant with mitigation incorporated.

RCRA Post-Closure and Hazardous Waste Facility Closure

This discussion addresses the five closure projects described in Section 3.7.4, *RCRA Post-Closure and Hazardous Waste Facility Closure*:

- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure

Thermal Treatment Facility Closure (Impact 4.5-3b)

The TTF closure project would include additional sampling, excavation, and disposal of about 300 CY of in situ soil and concrete debris at an offsite RCRA permitted disposal facility,

followed by confirmation sampling and site restoration. A TTF closure plan would be submitted to DTSC for review and approval prior to implementation of facility closure. The TTF excavation would occur within an area marginally susceptible to unstable soil conditions, such as landslides, where excavation could affect slope instability if improperly done. The activities proposed for the TTF closure are similar to those of the overall site cleanup described previously. Excavated areas would be restored so that the drainage pattern in the area would be similar to the pre-excavation condition by backfilling and recontouring the area. Vegetated areas, if any, would be reseeded as required by Mitigation Measure BIO-5.

Compliance with the DTSC-approved closure plan and OSHA excavation requirements (such as bracing or underpinning of excavated faces) would ensure that cleanup activities would not create new areas of soil instability. The Construction General Permit would require the implementation of a SWPPP (Mitigation Measure HYDRO-1) to control runoff and further reduce impacts to the stability of soils. Compliance with these regulations would ensure that impacts related to slope instability would be less than significant. In addition, impacts would be further reduced by the implementation of the approved soil management plan (Mitigation Measure AQ-4). The geotechnical recommendations regarding fill material and grading characteristics for excavation and backfilling also include restoring the drainage pattern, minimizing the risk that new areas of soil instability would be created by the project (Mitigation Measure GEO-1). Consistent with the overall site cleanup, the TTF closure design would include soil stabilization BMPs during site restoration (Mitigation Measure BIO-5) and post-cleanup maintenance required by the SWPPP (Mitigation Measure HYDRO-1), which would also minimize the potential for site soils to become unstable.

> Conclusion: All excavation work for the TTF project would be completed in compliance with the DTSC-approved closure plan, the SWPPP required by the Construction General Permit, and OSHA excavation requirements. With implementation of Mitigation Measures GEO-1, AQ-4, BIO-5, and HYDRO-1, this impact would be less than significant with mitigation incorporated.

Radioactive Materials Handling Facility Closure and Hazardous Waste Management Facility Closure (Impact 4.5-3b)

As described in Section 3.7.4, buildings and features would be demolished using standard construction equipment and demolition techniques. Construction staging areas would not require grading or significant removal of vegetation. Following demolition, demolition areas would be placed in a safe-and-stable configuration to facilitate later soil characterization and remediation. The RMHF and HWMF facilities are predominantly located in the relatively flat Burro Flats area, within which the land would likely remain stable. Demolition of buildings along the northwest edge of the Burro Flats area may modify materials marginally susceptible to unstable soil issues, such as landsliding.

Similar to demolition, during excavation, the potential for the RMHF and HWMF projects to increase soil instability and result in onsite or offsite soil mobilization would be minimized by compliance with DTSC-approved closure plans, which would ensure that impacts related to slope instability would be less than significant. In addition, stockpiles would be secured per the SWPPP

(Mitigation Measure HYDRO-1). In addition, Mitigation Measure BIO-5 requires that disturbed vegetated areas are revegetated, which would stabilize disturbed soils. Also, stockpiled material would be covered with non-toxic dust suppressants or tarps in accordance with Mitigation Measure AQ-4.

During the safe-and-stable configuration stage, building sites would generally not be at risk for destabilizing soils because most of the sites are located on relatively flat topography. Regardless of topography, all of the sites would be required to comply with the SWPPP post-cleanup BMPs that minimize the potential for onsite erosion or the transport of soil offsite during the safe-and-stable configuration stage (Mitigation Measure HYDRO-1).

> Conclusion: The closure of the RMHF and HMWF would generally occur in an area not susceptible to unstable soil conditions, such as landsliding, and the projects would include multiple design features to stabilize slopes during cleanup and after the projects are completed. Implementation of Mitigation Measures GEO-1, AQ-4, BIO-5, and HYDRO-1 would reduce risks due to unstable soils. This impact would be less than significant with mitigation incorporated.

Areas I, II, and III Impoundment Post-Closure (Impact 4.5-3b)

Impoundment maintenance would include a work crew of up to three people checking existing concrete diversion channels to ensure they are effective and maintaining vegetative cover, both of which would minimize the potential for soil instability in the area or offsite. No excavation would be performed as part of the maintenance activities, so the impact would be less than significant.

> Conclusion: The proposed monitoring and maintenance activities for the Areas I, II, and III Impoundment Post-Closure projects would maintain slope stability and would not significantly alter existing conditions at the site. The effects of monitoring and maintenance related to permit renewals on slope instability would be less than significant with mitigation incorporated.

Impact 4.5-3b Determination: *The* ***initial activities*** *could result in conducting activities or placing structures on unstable geologic units or units that would become unstable as a result of project activities. With implementation of Mitigation Measures GEO-1, AQ-4, BIO-5, and HYDRO-1, this impact would be* ***less than significant with mitigation incorporated****.*

4.5.5.4 Expansive Soils

Program Assessment

Impact 4.5-4a: Would the **overall site cleanup** be located on expansive soil and create substantial risks to life or property?

Overall Site Cleanup (Impact 4.5-4a)

While representative soil texture (the array of particle sizes in the soil) data were collected as part of background studies to characterize the site, the expansion index (which is the basis for the classification of a soil as expansive per the California Building Code) was not calculated for these representative samples. However, as described in Mitigation Measure GEO-1, geotechnical investigations would include evaluation of soil expansion potential for those treatment sites that include facilities (e.g., soil vapor extraction and treatment systems). Soil expansion potential can be approximated based on existing information, but whether the soil qualifies according to the California Building Code standard cannot be determined until preparation of geotechnical reports for specific cleanup projects.

As indicated previously in Section 4.5.1 and Table 4.5-2, soils with moderate to high expansion potential can be found in some areas at the site. Approximately 18 percent of the total site area has a low to high expansion potential. While potentially expansive soils are present at the site, they pose a relatively low risk to life and property for overall site cleanup for the following reasons:

- Excavation would remove some potentially expansive soils at the site, particularly in the Burro Flats area.
- Soil expansion at excavation and backfill sites, if any, would have no impact since there would be no structures to damage.
- For treatment sites with facilities (wells, piping, treatment system equipment), none of the facilities to be constructed on site would be occupied (i.e., no buildings would be constructed for occupation by workers or residents). Incremental movement of these facilities would not be expected to damage the facilities.

Geotechnical reports prepared for overall site cleanup as described in Mitigation Measure GEO-1 would include recommendations for the facilities to be installed at the site to be designed to withstand seismic ground shaking, the removal of problematic soils, and recommendations both for suitability of imported soil as fill and for placement and compaction of fill materials. These recommendations would also increase the strength of the facilities to resist the force exerted on the facilities by soil expansion. Given the relatively low susceptibility of the proposed cleanup activities to damage from soil expansion and the geotechnical recommendations to protect against seismic activity, impacts would be less than significant.

> Conclusion: The overall site cleanup could risk life and property due to expansive soil at the project site. Mitigation Measure GEO-1 would reduce this impact through implementation of recommendations from the site-specific geotechnical evaluation. This impact would be less than significant with mitigation incorporated.

Impact 4.5-4a Determination: *The* ***overall site cleanup*** *could risk life and property due to expansive soil at the project site. Mitigation Measure GEO-1 would reduce impacts related to risks to life and property resulting from expansive soil at the project site. This impact would be* ***less than significant with mitigation incorporated****.*

Initial Project Assessment

Impact 4.5-4b: Would the **initial activities** be located on expansive soil and create substantial risks to life or property?

DOE Area IV Radiological and Contiguous Chemically Impacted Soil Removal (Impact 4.5-4b)

The DOE initial project would remove soil with moderate to high potential for soil expansion. As described previously for the overall site cleanup, while potentially expansive soils are present at the site, they pose a relatively low risk to life and property for the DOE initial project for multiple reasons, and impacts would be less than significant. In addition, the geotechnical report that would be prepared for the project (Mitigation Measure GEO-1) would include measures to address grading and soil hazards that exist at the site, and preparing recommendations both for suitability of imported soil as fill and for placement and compaction of fill materials. Excavated areas would be backfilled with material determined by qualified engineers to be suitable for use at the site.

> Conclusion: This project could risk life and property due to expansive soil at the project site. Mitigation Measure GEO-1 would reduce this impact. This impact would be less than significant with mitigation incorporated.

NASA Liquid Oxygen Plant (Impact 4.5-4b)

The NASA initial project would remove soils with low potential for soil expansion and would result in a less than significant impact. In addition, the geotechnical report that would be prepared for the project (Mitigation Measure GEO-1) would include measures to address grading and soil hazards that exist at the site and would include recommendations for ensuring suitability of imported soil as fill and for placement and compaction of fill materials. Excavated areas would be backfilled with material determined to be suitable for use at the site by qualified engineers.

> Conclusion: Impacts related to risks to life and property resulting from expansive soil at the Liquid Oxygen Plant site would be less than significant. Implementation of Mitigation Measure GEO-1 would further reduce this impact.

DOE Building Demolition Activities (Impact 4.5-4b)

The built environment resources to be demolished under this initial project for DOE are located on soils of low to moderate soil expansion potential. In addition, the proposed project does not include construction of any structures for human occupancy. As described previously for overall site cleanup, while potentially expansive soils are present at the site, they pose a relatively low risk to life and property for the demolition activities, and impacts would be less than significant.

> Conclusion: Impacts related to risks to life and property resulting from expansive soil for the demolition activities would be less than significant. Implementation of Mitigation Measure GEO-1 would further reduce this impact.

RCRA Post-Closure and Hazardous Waste Facility Closure

Thermal Treatment Facility Closure (Impact 4.5-4b)

The underlying soils at the TTF site have low soil expansion potential. As described previously for the overall site cleanup, while potentially expansive soils are present at the site, they pose a relatively low risk to life and property for the TTF closure for multiple reasons, and implementation of this post-closure project would be less than significant. In addition, no facilities would be constructed after demolition.

> Conclusion: Impacts related to risks to life and property resulting from expansive soil at the TTF Closure would be less than significant. Implementation of Mitigation Measure GEO-1 would further reduce this impact.

Radioactive Materials Handling Facility and Hazardous Waste Management Facility Closures (Impact 4.5-4b)

The buildings to be decontaminated and demolished for these two initial activities are located on soils with low soil expansion potential. As described previously for the overall site cleanup, while potentially expansive soils are present at the project site, they pose a relatively low risk to life and property for the RMHF and HWMF closure projects, and impacts would be less than significant. In addition, no structures would be constructed after demolition.

> Conclusion: The risks to life and property resulting from expansive soil at the RMHF and HWMF closure projects would be less than significant. Implementation of Mitigation Measure GEO-1 would further reduce this impact.

Areas I, II, and III Impoundment Post-Closure (Impact 4.5-4b)

The proposed activities associated with the impoundment permits are limited to managing the existing impoundments through monitoring and periodic maintenance. There would be no impact because there would be no changes to the existing systems. Monitoring and maintenance for permit renewals would not result in installation of new facilities on expansive soil.

> Conclusion: The Areas I, II, and III Impoundment Post-Closure activities would not result in installation of new facilities and would not otherwise affect the exposure of life or property to expansive soils. Therefore, there would be no impact.

Impact 4.5-4b Determination: *The proposed* ***initial activities*** *would result in placing structures on expansive soils that would result in risk posed to life or property by expansive soil. Implementation of Mitigation Measure GEO-1 would reduce this impact. This impact would be* ***less than significant with mitigation incorporated****.*

4.5.6 Mitigation Measures

The following measures shall be implemented to mitigate impacts related to geology, soils and seismicity:

AQ-4: Soil Management Plan (see Section 4.2.6 for description).

BIO-5: Revegetation Plan (see Section 4.3.6 for description).

HYDRO-1: Stormwater Pollution Prevention Program (SWPPP) (see Section 4.8.6 for description).

GEO-1: Geotechnical Evaluation. Prior to commencement of cleanup activities, site-specific geotechnical evaluations shall be developed, by the RPs, under the direction of DTSC, in accordance with applicable regulations. Each geotechnical evaluation shall be prepared by a registered geotechnical engineer and approved prior to implementation. DTSC shall work with Ventura County to facilitate review and approval as necessary, based on the scope of the investigation. Specific measures to reduce the potential physical hazards associated with strong seismic ground shaking, liquefaction, subsidence, unstable soil conditions, temporary slopes and excavations, permanent slopes, and other earthwork-related conditions during cleanup shall be recommended in the report and implemented by the RPs.

4.5.7 Impact Summary

Table 4.5-3 summarizes the proposed project's impacts and significance determinations related to geology, soils, and seismicity.

TABLE 4.5-3
SUMMARY OF IMPACTS – GEOLOGY, SEISMICITY, AND SOILS

Impact	Overall Site Cleanup	DOE Initial Project	NASA Initial Project	DOE Demolition Activities	RCRA Post-Closure and Facility Closure	Mitigation Measures
Impact 4.5-1a: Earthquake Faults and seismic events	LSM	--	--	--	--	GEO-1, HYDRO-1
Impact 4.5-1b: Earthquake Faults and seismic events	--	LSM	LSM	LSM	LSM	GEO-1, HYDRO-1
Impact 4.5-2a: Soil erosion or loss of topsoil	LSM	--	--	--	--	AQ-4, BIO-5, GEO-1, HYDRO-1
Impact 4.5-2b: Soil erosion or loss of topsoil	--	LSM	LSM	LSM	LSM	AQ-4, BIO-5, GEO-1, HYDRO-1
Impact 4.5-3a: Unstable geologic units	LSM	--	--	--	--	AQ-4, BIO-5, GEO-1, HYDRO-1
Impact 4.5-3b: Unstable geologic units	--	LSM	LSM	LSM	LSM	AQ-4, BIO-5, GEO-1, HYDRO-1
Impact 4.5-4a: Problematic soils	LSM	--	--	--	--	GEO-1
Impact 4.5-4b: Problematic soils	--	LSM	LSM	LSM	LSM	GEO-1

LSM = Less than significant with mitigation incorporated

4.6 Greenhouse Gas

This section evaluates the potential for impacts related to greenhouse gas (GHG) emissions and global climate change resulting from implementation of the overall site cleanup and the initial activities. The existing setting related to climate change is described along with the relevant regulatory background. Project impacts and mitigation measures, as necessary, are presented.

4.6.1 Environmental Setting

Gases that trap heat in the atmosphere are called GHGs. The main concern with GHGs is that increases in GHG concentrations in the Earth's atmosphere are causing global climate change. Global climate change is a change in the average weather on Earth that can be measured by wind patterns, storms, precipitation, and temperature.

The principal GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs). Because different GHGs have different Global Warming Potentials (GWPs) and CO_2 is the most common reference gas for climate change, GHG emissions are often quantified and reported as CO_2 equivalents (CO_2e). For example, SF_6 is a GHG commonly used in the utility industry as an insulating gas in circuit breakers and other electronic equipment. SF_6, while comprising a small fraction of the total GHGs emitted annually worldwide, is a much more potent GHG with 22,800 times the GWP as CO_2. Therefore, an emission of one metric ton (MT) of SF_6 could be reported as an emission of 22,800 MT of CO_2e (Intergovernmental Panel on Climate Change [IPCC], 2007). Large emission sources are reported in million metric tons (MMT) of CO_2e.[1]

Global warming can affect California by reducing snow pack, increasing sea-level rise, and increasing the number of extreme heat days per year, high ozone days, wildfires, and drought years. Globally, climate change has the potential to impact numerous environmental resources through potential changes related to future air and ocean temperatures and precipitation patterns. The projected consequence of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects (IPCC, 2001):

- Higher maximum temperatures and more hot days over nearly all land areas
- Higher minimum temperatures and fewer cold days and frost days over nearly all land areas
- Reduced diurnal temperature range over most land areas
- Increase of heat index over land areas
- More intense precipitation events

[1] A metric ton is 1,000 kilograms; it is equal to approximately 1.1 U.S. tons and approximately 2,204.6 pounds.

Also, there are many secondary effects that are projected to result from global warming, including global rise in sea level, ocean acidification, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully understood and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be great.

California produced 459 gross $MMTCO_2e$ in 2012 (CARB, 2014a). This is an increase from levels between 2009 and 2011 (458.44, 453.06, and 450.94 $MMTCO_2e$ for each year, respectively) but a decrease from levels between 2000 and 2008, where emissions ranged from a low of 466.32 in 2000 to a high of 492.86 in 2004 (CARB, 2014a). Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2012, accounting for 36 percent of total GHG emissions in the state (CARB, 2014a). This sector was followed by the electric power sector (including both in-state and out-of-state sources) (21 percent) and the industrial sector (19 percent) (CARB, 2014a).

4.6.1.1 Existing Conditions

Current operations onsite include monitoring and maintenance for the existing groundwater extraction and treatment system and the existing surface water treatment systems. In support of the continuing activities, each of the RPs has workers or contractors accessing the site daily. Boeing has 15 workers and 15 contractors, DOE has 2 workers, and NASA has 5 workers.[2] The commuting and onsite travel of these workers and contractors result in the emissions of criteria pollutants. In addition, existing operations consume approximately 117,602 kilowatt hours (kWh) per month, or 1,411 megawatt hours (MWh) per year. Emissions are quantified as defined in the methodology section below. **Table 4.6-1** shows the existing onsite GHG emissions.

TABLE 4.6-1
EXISTING ONSITE EMISSIONS

	MT/year			
	CO_2	CH_4	N_2O	CO_2e
Electrical	404	<1	1	451
Boeing Worker Commute	250	<1	-	206
DOE Worker Commute	17	<1	-	13
NASA Worker Commute[1]	40	<1	-	40
Total Existing				**710**

1 Note that NASA demolition activities were not operational at the time of the NOP; therefore, they are not included in the existing conditions.
2 The <1 designation indicates that while there are emissions they are less than 1 MT per year.

SOURCE: ESA, 2017b (see Appendix E of this PEIR).

2 The NOP was completed before NASA began demolition of existing structures. The personnel onsite consist of one NASA civil servant and four NASA contractors for environmental investigation (NASA, 2016). The analysis assumed six workers as a worst-case scenario based on the information provided at the time the analysis was conducted.

4.6.2 Regulatory Setting

4.6.2.1 Federal

Clean Air Act

The principal air quality regulatory mechanism at the federal level is the CAA and, in particular, the 1990 amendments to the CAA, which established the NAAQS. The federal CAA does not specifically regulate GHG emissions; however, the U.S. Supreme Court has determined that GHGs are pollutants that can be regulated under the federal CAA. There are currently no federal regulations that set ambient air quality standards for GHGs.

Fuel Efficiency Standard

The federal government sets emission standards for construction equipment. The first federal standards (Tier 1) were adopted in 1994 for all off-road engines over 50 horsepower (hp) to be phased in by 2000. In 1998, a new standard was adopted that introduced Tier 1 for all equipment below 50 hp and introduced the Tier 2 and Tier 3 standards. Tier 2 and Tier 3 standards for all equipment was to be phased in by 2008. Tier 4 efficiency requirements are contained in 40 Code of Federal Regulations Parts 1039, 1065, and 1068 (originally adopted in 69 Federal Register 38958 [June 29, 2004], and were most recently updated in 2014 [79 Federal Register 46356]). Emissions requirements for new off-road Tier 4 vehicles were to be completely phased in by the end of 2015.

4.6.2.2 State

Executive Orders S-3-05 & B-30-15

In 2005, in recognition of California's vulnerability to the effects of climate change, Governor Schwarzenegger established Executive Order S-3-05, which set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels
- By 2020, reduce GHG emissions to 1990 levels
- By 2050, reduce GHG emissions to 80 percent below 1990 levels

In 2015, Governor Brown issued Executive Order B-30-15 to establish a GHG reduction target of 40 percent below 1990 levels by 2030. These orders are only applicable to "state agencies with jurisdiction over sources of greenhouse gas emissions" (Order B-30-15 Section 2). There is currently no implementation strategy for these Executive Orders (i.e., a plan, similar to the AB 32 Scoping Plan, which apportions GHG reductions by economic sector/activity/region).

Executive Order S-1-07

Executive Order S-1-07, which was signed by Governor Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California. It establishes a goal to reduce the carbon intensity of transportation fuels sold in California by at least 10 percent by 2020. As a result of this order, California Air Resources Board (CARB) adopted a regulation to implement the Low Carbon Fuel Standard (LCFS) on April 23, 2009, which would reduce GHG

emissions from the transportation sector in California by about 16 MMT CO_2e by 2020. The LCFS is designed to reduce California's dependence on petroleum, create a lasting market for clean transportation technology, and stimulate the production and use of alternative, low-carbon fuels in California. The LCFS is designed to provide a durable framework that uses market mechanisms to spur the steady introduction of lower carbon fuels. The framework establishes performance standards that fuel producers and importers must meet each year, which began in 2011.

Assembly Bill 32

In response to the 2006 Executive Order, the California Legislature adopted AB 32, the Global Warming Solutions Act of 2006, which requires CARB to establish a statewide GHG emissions cap for 2020 based on 1990 emission levels. AB 32 required CARB to adopt and enforce programs and regulations that identify and require selected sectors or categories of emitters of GHGs to report and verify their statewide GHG emissions. In December 2007 CARB adopted 427 MMT CO_2e as the statewide GHG emissions limit equivalent to the statewide levels for 1990. This is approximately 28 percent below forecasted 2020 "business-as-usual" emissions of 596 MMT of CO_2e, and about 10 percent below average annual GHG emissions during the period of 2002 through 2004 (CARB, 2008).[3,4]

CARB published the "Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration" in September 2007 (CARB, 2007). CARB adopted nine Early Action Measures for implementation, including Ship Electrification at Ports, Reduction of High Global-Warming-Potential Gases in Consumer Products, Heavy-Duty Vehicle Greenhouse Gas Emission Reduction (Aerodynamic Efficiency), Reduction of Perfluorocarbons from Semiconductor Manufacturing, Improved Landfill Gas Capture, Reduction of Hydrofluorocarbon-134a from Do-It-Yourself Motor Vehicle Servicing, Sulfur Hexaflouride Reductions from the Non-Electric Sector, a Tire Inflation Program, and an LCFS.

By January 1, 2011, CARB was required to adopt rules and regulations (which were to become operative January 1, 2012), to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 permitted the use of market-based compliance mechanisms to achieve those reductions. AB 32 also required CARB to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism that it had adopted.

As of January 1, 2012, the GHG emissions limits and reduction measures adopted in 2011 by CARB became enforceable. In designing emission reduction measures, CARB must aim to minimize costs, maximize benefits, improve and modernize California's energy infrastructure, maintain electric system reliability, maximize additional environmental and economic co-benefits for California, and complement the state's efforts to improve air quality.

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3 The Scoping Plan document states "approximately 30 percent from BAU analysis (CARB, 2008 pg. 12). When calculated the percent reduction between the 1990 goal of 427 MMT CO_2e by 2020 and the 2020 BAU of 596 MMT CO_2e equals 28.36 [(596 – 427)/596).

4 Updates to these values are discussed under the Climate Change Scoping Plan in Section 3.6.3.2.4.

Senate Bill 97

Senate Bill (SB) 97 (Chapter 185, Statutes of 2007), enacted in 2007, amended CEQA to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directed the California Office of Planning and Research (OPR) to develop revisions to the State CEQA Guidelines "for the mitigation of GHG emissions or the effects of GHG emissions" and directed the Resources Agency to certify and adopt these revised State CEQA Guidelines by January 2010. The revisions were completed in March 2010 and codified into the California Code of Regulations and became effective within 120 days pursuant to CEQA. The amendments provide regulatory guidance for the analysis and mitigation of the potential effects of GHG emissions. The CEQA Guidelines require:

- Inclusion of GHG analyses in CEQA documents
- Determination of significance of GHG emissions
- If significant GHG emissions would occur, adoption of mitigation to address significant emissions

Climate Change Scoping Plan

In December 2008, CARB approved the AB 32 Climate Change Scoping Plan (Scoping Plan) outlining the State's strategy to achieve the 2020 GHG emissions limit (CARB, 2008). The first update to the AB 32 Scoping Plan was approved on May 22, 2014, by CARB. As part of the proposed update to the Scoping Plan, the emissions reductions required to meet the 2020 statewide GHG emissions limit were further adjusted (CARB, 2014b). As recently described by the California Governor in the 2015 Executive Order "California is on track to meet or exceed the current target of reducing greenhouse gas emissions to 1990 levels by 2020, as established in the California Global Warming Solutions Act of 2006 (AB 32)" (Brown, 2015). In 2016 SB 32 was passed which codifies the reduction target of GHG emissions to 40 percent below 1990 levels by 2030. AB 197 was also passed which provides additional direction to for developing the Scoping Plan. Currently, the Final Proposed Scoping Plan is out for review which will update the Scoping Plan to reflect the 2030 targets and how they will be achieved.

Senate Bill 375

SB 375, which establishes mechanisms for the development of regional targets for reducing passenger vehicle GHG emissions, was adopted by the State on September 30, 2008. On September 23, 2010, CARB adopted the vehicular GHG emissions reduction targets that had been developed in consultation with the metropolitan planning organizations (MPOs); the targets require a 7 to 8 percent reduction by 2020 and between 13 to 16 percent reduction by 2035 for each MPO. SB 375 recognizes the importance of achieving significant GHG reductions by working with cities and counties to change land use patterns and improve transportation alternatives. Through the SB 375 process, MPOs such as SCAG work with local jurisdictions in the development of sustainable communities strategies (SCS) designed to integrate development patterns and the transportation network in a way that reduces GHG emissions while meeting housing needs and other regional planning objectives. SCAG's reduction target for per capita vehicular emissions is 8 percent by 2020 and 13 percent by 2035 (CARB, 2010).

In April 2012, the SCAG adopted the 2012-2035 RTP/SCS. SCAG's RTP/SCS includes a commitment to reduce emissions from transportation sources by promoting compact and infill development in order to comply with SB 375. However, the RTP/SCS strategies do not apply to the project as they focus on land use development decisions.

4.2.2.3 Regional

Ventura County Air Pollution Control District

VCAPCD has not adopted a significance threshold with respect to GHG emissions. Their most recent proposal of emissions (VCAPCD, 2011) summarizes the most prominent approaches and options that have been adopted or considered, including having a tiered approach that involves first applicability of CEQA exemptions, followed by consistency with a local climate action plan, then by an efficiency-based threshold and/or a bright line gap-based threshold. The other options include thresholds based on capturing 90 percent of project GHG emissions or thresholds based on air agencies' criteria pollutant thresholds. Based on this report, VCAPCD is still evaluating suitable GHG thresholds but holds preference for GHG thresholds consistent with the SCAQMD and SCAG region.

South Coast Air Quality Management District

SCAQMD has adopted an annual screening level threshold of 10,000 MT CO_2e for industrial projects for which the SCAQMD is the CEQA lead agency or has discretionary approval (SCAQMD, 2008). SCAQMD, in accordance with CEQA Guidelines Section 15064.7, adopted its annual threshold for industrial sources under a public review process as part of stakeholder working group meetings that were open to the public and based on substantial evidence. The intent of the threshold is to capture 90 percent of total emissions from all new or modified industrial and stationary source sector projects subject to a CEQA analysis where SCAQMD is the lead agency. Data collected by SCAQMD from its Annual Emissions Reporting (AER) Program indicates that a 90 percent capture rate would cover a substantial portion of future project emissions and would exclude small projects that would in aggregate contribute a relatively small fraction of the cumulative statewide GHG emissions (SCAQMD, 2008). The SCAQMD estimates that these small projects would in aggregate contribute less than 1 percent of the future 2050 statewide GHG emissions target.

4.6.2.4 Local

The project site is located within the County of Ventura and the local roadway network that would be used by project-related trucks is located in the county and city of Los Angeles. As such, this analysis considers the plans, policies, and standards from these relevant jurisdictions.

Ventura County General Plan

The following policies from the General Plan are relevant to the project (Ventura County, 2015).

Greenhouse Gas Emissions Resource Policies

1.2.2-3: Discretionary development that would have a significant adverse air quality impact shall only be approved if it is conditioned with all reasonable mitigation measures to avoid,

minimize, or compensate (offset) for the air quality impact. Developers shall be encouraged to employ innovative methods and technologies to minimize air pollution impacts.

1.2.2-5: Development subject to Air Pollution Control District (APCD) permit authority shall comply with all applicable APCD rules and permit requirements, including the use of best available control technology (BACT) as determined by the APCD.

County of Los Angeles General Plan

The following policies from the General Plan are relevant to the project (Los Angeles County, 2015):

Air Quality Element

AQ 3.4: Participate in local, regional and state programs to reduce greenhouse gas emissions.

AQ 3.8: Develop, implement, and maintain countywide climate change adaptation strategies to ensure that the community and public services are resilient to climate change impacts.

Mobility Element

M 4.15: Reduce vehicle trips through the use of mobility management practices, such as the reduction of parking requirements, employer/institution based transit passes, regional carpooling programs, and telecommuting.

City of Los Angeles General Plan

The following goal in the 1992 Los Angeles General Plan pertains to the project:

Goal 2: Less reliance on single-occupant vehicles with fewer commute and non-work trips

Sustainable City pLAn

The *Sustainable City pLAn* is a comprehensive and actionable directive from the City of Los Angeles Mayor to improve the environmental, economic, and equitable conditions in the city of Los Angeles (City of Los Angeles, 2015). The Plan is a tool to manage the city and establish visions, goals, and metrics for City departments. The project is not within the jurisdiction of the City of Los Angeles and the Sustainable City pLAn is focused on municipal and development activities and therefore is not applicable to the cleanup activities.

City of Los Angeles Green LA Plan

The City of Los Angeles Green LA Plan (Los Angeles, 2007) is the framework for the City to confront global climate change. The Green LA Plan engages residents and the City alike to create a cleaner, "greener," sustainable Los Angeles and to grow a "green" economy. However, as the site is not located within the jurisdiction of the City of Los Angeles, and the plan focuses on development projects, the plan is not applicable to the cleanup activities.

City of Los Angeles ClimateLA Program Document

The ClimateLA Program Document is the implementation program that provides the detailed information on each action identified in the Green LA Plan. ClimateLA is a living document that reflects a process of ongoing learning and continuous improvement as technology advances and City departments develop expertise in the methods of lowering GHG emissions. However, as the

site is not located within the jurisdiction of the City of Los Angeles, and the plan focuses on municipal projects, the plan is not applicable to the cleanup activities.

City of Simi Valley General Plan

The following policy in the Simi Valley General Plan pertains to the commuter trips associated with the cleanup activities:

> Strategy A-1: Reduce Vehicle Trips generated, gasoline consumption, and greenhouse gas emissions.

City of Simi Valley Climate Action Plan

The City of Simi Valley adopted a Climate Action Plan (SV-CAP) in June of 2012. The SV-CAP was developed to state and city objectives (Simi Valley, 2012). However, the site is not located within the jurisdiction of Simi Valley and therefore the climate action plan is not applicable the cleanup activities.

4.6.3 Thresholds of Significance

For the purposes of this PEIR, DTSC has used the checklist questions in Appendix G of the CEQA Guidelines as thresholds of significance to determine whether the project would have a significant environmental impact regarding climate change. In addition, Ventura County's Initial Study Assessment Guidelines have been incorporated, where appropriate, into the analysis. Based on the size and scope of the project and the potential for impacts, the criteria identified below are included for evaluation in this PEIR:

Would the project:

4.6-1 Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment (refer to Impact Statements 4.6-1a and 4.6-1b)?

4.6-2 Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs (refer to Impact Statements 4.6-2a and 4.6-2b)?

Implementation of the cleanup activities would incrementally contribute to GHG emissions along with past, present, and future activities, and the CEQA Guidelines acknowledge this as a cumulative impact. As such, impacts of GHG emissions are analyzed here on a cumulative basis.

As detailed in Section 4.2.2.3, *Regional* above, VCAPCD does not have an adopted threshold with respect to GHG emissions. SCAQMD has adopted an annual screening level threshold of 10,000 MT CO_2e for industrial projects for which the SCAQMD is the CEQA lead agency or has discretionary approval.

The County of Los Angeles has a Community Climate Action Plan that addresses county emissions and how development within the county can reduce emissions and comply with the state regulations. However, the site is not located within the jurisdiction of Los Angeles County and therefore the Community Climate Action Plan is not applicable to the cleanup activities.

The City of Los Angeles *L.A. CEQA Thresholds Guide* (City of Los Angeles, 2006) does not provide guidance on how climate change issues should be addressed in CEQA documents, nor has the City of Los Angeles adopted specific thresholds with respect to GHG emissions.

Although no formal significance threshold for GHG emissions associated with this type of project has been adopted by the Cities of Los Angeles or Simi Valley, the County of Ventura, County of Los Angeles, VCAPCD, or SCAQMD at this juncture, Section 15064.7(c) of the CEQA Guidelines states: "when adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies…" SCAQMD's 10,000 MT CO_2e per year threshold applies to industrial and stationary source annual long-term GHG emissions. The cleanup activities would generate most of its GHG emissions over a 15-year period. The majority of GHG emissions would cease after cleanup activities are completed. Monitoring and maintenance activities would continue until no longer necessary.

Because the County of Ventura, County of Los Angeles, City of Los Angeles or Simi Valley, and VCAPCD have not adopted any significance criteria for GHG analysis at the time of this writing, it is reasonable for the CEQA Lead Agency to utilize the threshold adopted by SCAQMD. Additionally, for CEQA purposes, DTSC has determined that the appropriate threshold of significance to assess the GHG impacts of a project of this nature with respect to significance criterion 4.6-1 is SCAQMD's 10,000 $MTCO_2e$ per year threshold. In addition, with respect to significance criterion 4.6-2, DTSC has determined that the appropriate threshold of significance is assessing the project's general consistency with the goals of AB 32. While AB 32 does not prescribe specific project-level measures, the 2014 Climate Change Scoping Plan provides strategies for the State to reduce GHG emissions in order to achieve the 2020 target.

4.6.4 Methodology

Because the project consists of soil and groundwater cleanup along with demolition activities within the 2,850-acre project site, GHG emissions generated by remediation activities have been quantitatively estimated and compared to the applicable standards and thresholds of significance.

Cleanup Emissions

Because the project site is located in unincorporated Ventura County directly adjacent to Los Angeles County, the project's onsite impacts related to the cleanup activities were evaluated using the assessment methodology, criteria, and reporting procedures provided in the Ventura County *Air Quality Assessment Guidelines* and SCAQMD's *CEQA Air Quality Handbook*.

As discussed in Section 3.6 of this PEIR, the overall site cleanup would consist of excavation and offsite disposal of contaminated soil, demolition of existing structures, monitoring, and cleanup of impacted groundwater. As discussed in detail in Section 3.7 of this PEIR, the initial activities would consist of excavation and offsite disposal of contaminated soil, demolition of existing structures, and monitoring. Remediation treatments for the overall cleanup project may also include soil vapor extraction, bioventing, gaseous electron donor injection, ex situ biological treatment, monitored natural attenuation, soil solidification/stabilization, thermal desorption,

capping (only Boeing), lead shot and clay pigeon cleanup, groundwater extraction and treatment systems, enhanced groundwater treatment, air sparging and vapor extraction, passive treatment, bedrock removal for strontium 90, bedrock vapor extraction, and decommissioning of water supply wells.

The exact nature and timing of the alternative treatment methods for the overall cleanup project (as well as whether the method would even be used in most cases) is still unknown. The emissions from equipment for alternative methods would be similar or less intensive than soil excavation, demolition, and hauling. The cleanup operations are anticipated to require a maximum of 250 workers onsite. Thus, the analysis uses excavation and hauling to demonstrate worst-case peak daily emissions for all remediation scenarios. Actual annual emissions could be less than those estimated by the analysis, because peak-daily emissions are unlikely to occur over the course of the entire year.

Emissions of GHGs associated with the cleanup activities were modeled using the California Emissions Estimator Model (CalEEMod), Version 2016.3.1, User Guide for formula and emission factors for off-road construction equipment and fugitive dust emissions. EMFAC2014 was used to determine emission factors for on-road vehicles. Modeling of GHG emissions was based on project-specific data, reasonable assumptions based on projects of similar scope, or default CalEEMod values. Modeling output files are provided in Appendix E of this PEIR.

Emissions of CO_2 and CH_4 as well as the resulting total CO_2e emissions were calculated for remediation-related GHG sources such as off-road construction equipment, material delivery trucks, soil trucks, and worker vehicles. The use of global warming potentials GWPs from IPCC's AR4 is recommended in CARB's latest First Update to the Scoping Plan. Therefore, to determine CO_2e emissions, CH_4 emissions are multiplied by its GWP of 25.

GHG emissions are determined on an annual basis; therefore, as a conservative analysis, the project analyzes the maximum potential year for both the program level scenario as well as the initial activities.

For the program-level analysis, the emissions are based on having four excavation sites active per day and an average of 80 trucks accessing the site daily.[5] Additionally, worker commute emissions anticipated for up to 250 workers per day as well as maintenance and monitoring activity emissions are included in the program-level analysis. For the initial activities, the most conservative analysis assumes that a total of 96 trucks accessing the site every day. Additionally, emissions from the initial activities include worker commute emissions assuming a maximum of 71 workers daily. The daily trucks include hauling soil from the site, backfill transport to the site, and other materials deliveries as needed. The transport of impacted material associated with implementation of the cleanup activities is expected to require some travel outside the state of California. Emissions associated with out-of-state truck travel are provided for information purposes.

[5] An average of 80 trucks per day was used for overall site cleanup, because the level of activity is not anticipated to sustain 96 trucks per day over an entire year. The 80 trucks per day is an average daily activity level assumed over a peak year of activity.

Monitoring and Maintenance Emissions

Emissions of GHGs associated with the long-term monitoring and maintenance of the project were modeled using EMFAC2014 to determine emission factors for on-road vehicles, as well as GHG intensity factors for CO_2, CH_4, and N_2O associated with electrical consumption for the maintenance and monitoring activities. Modeling assumptions and output files are provided in Appendix E of this PEIR.

Monitoring would include regular inspections of vegetation, cover soil, diversion features and monitoring wells, and ongoing evaluation and reporting of the impacted groundwater, in accordance with the conditions stipulated in the corresponding water quality sampling and analysis plan.

Monitoring and maintenance emissions were determined based on the number of workers that would access the site daily, and the energy consumption of the activities. Approximately 72 workers and contractors are anticipated to access the site daily for the course of up to 30 years of monitoring and maintenance. Because monitoring and maintenance emissions could occur at the same time as the overall project activities, the emissions from the monitoring and maintenance are added to the program emissions prior to being compared to the SCAQMD threshold. Because monitoring and maintenance would not begin until after completion of the initial activities, these emissions are not included as part of the GHG analysis.

4.6.5 Analysis of Project Impacts

The following text describes the potential environmental impacts related to GHGs associated with implementing the overall site cleanup and initial activities, demarcated as impact "a" and "b" respectively. As presented in Section 3.7*, Initial Activities*, the initial activities include eight different projects. Depending on the degree to which impacts of the initial activities would be similar to or different from each other, the impact analysis for the initial activities for some thresholds has been combined accordingly (i.e., the number of separate discussions for impact for each threshold ranges from one to eight). Following each potential impact is a significance determination for each potential impact. Each impact discussion concludes with a significance determination.

4.6.5.1 Greenhouse Gas Emissions

Program Assessment

Impact 4.6-1a: Would the **overall site cleanup** generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Overall Site Cleanup (Impact 4.6-1a)

The overall site cleanup activities at the project site are expected to commence as soon as possible after approval by DTSC of the PEIR, and would be completed within 15 years. Most site activities would occur 5 days per week (Monday through Friday), 11 hours per day (7:00 a.m. to 6:00 p.m.). Longer work days during the summer and work on Saturdays may occur. As many as 250 employees are expected to be routinely onsite during soil removal activities. Use of heavy

off-road construction equipment would be required during the soil and groundwater cleanup activities at the project site. The project's cleanup activities also would involve the use of smaller power tools, generators, and other equipment that would create GHG emissions.

The overall site cleanup would generate GHG emissions from implementation of cleanup activities. Direct sources of GHGs associated with the overall site cleanup would consist of mobile sources from onsite construction equipment, trucks, and delivery and worker vehicle trips. Indirect GHG emissions would be associated with electrical and water consumption associated with onsite activities.

Annual emissions from overall site cleanup anticipated to occur are provided in **Table 4.6-2** and it is assumed that 80 trucks per day is the average daily haul potential over the course of the year. Because details about the total extent of activities, including the specific soil volumes to be transported to each landfill, are not known, total emissions for the overall cleanup activities are provided for only the maximum potential annual emissions to provide the most conservative estimate.

TABLE 4.6-2
UNMITIGATED OVERALL SITE CLEANUP GHG EMISSIONS MT/YR[1]

	CO_2	CH_4	N_2O	CO_2e
Overall Site Cleanup	15,387	613		16,000
Monitoring and Maintenance	1,160	<1	1	1,162
Maximum Total[2]				17,162
Threshold (2020)				10,000
Exceeds Threshold				**Yes**
Outside of California (Max Potential)[3]				**66,693**

1 Assumes an average of 80 trucks per day (see Section 4.6.4, Methodology, for more information about truck trip assumptions).
2 Maximum Project Total is the sum of the monitoring and maintenance emissions plus the overall site cleanup.
3 Assumes all soil goes to the furthest location outside California, based on potential locations by RP.
NOTE: Rows and columns may not add exactly due to rounding
SOURCE: ESA, 2017b (see Appendix E of this PEIR).

As shown, the overall site cleanup's total estimated GHG emissions during remediation and maintenance and monitoring would exceed the regulatory threshold of 10,000 MT CO_2e per year and the impacts are potentially significant.

Implementation of Mitigation Measures GHG-1, TRANS-1, EC-1, EC-2 and AQ-5 would reduce GHG emissions by limiting vehicle emissions (either to transport debris or workers, or limiting the amount of time trucks are idling). Implementation of Mitigation Measure GHG-2 would reduce on road emissions by using a newer truck fleet and therefore reduce CO_2e emissions, as shown in **Table 4.6-3**.

TABLE 4.6-3
MITIGATED OVERALL SITE CLEANUP GHG EMISSIONS MT/YR[1]

	CO_2	CH_4	N_2O	CO_2e
Overall Site Cleanup	14,102	549		14,651
Monitoring and Maintenance	1,160	<1	1	1,162
Offsite GHG Reduction Measures and/or GHG Offsets (Mitigation Measure GHG-3)				(5,814)
Maximum Total[2]				9,999
Threshold (2020)				10,000
Exceeds Threshold				**No**
Outside of California (Max Potential)[3]				**59,954**

1 Assumes an average of 80 trucks per day (see Section 4.6.4, Methodology, for more information about truck trip assumptions).
2 Maximum Project Total is the sum of the monitoring and maintenance emissions plus the overall site cleanup.
3 Assumes all soil goes to the furthest location outside California, based on potential locations by RP.
NOTE: Rows and columns may not add exactly due to rounding.
SOURCE: ESA, 2017b (see Appendix E of this PEIR).

Mitigation Measure GHG-3 requires the creation of a Greenhouse Gas Emissions Reduction Plan. The Plan will require that each RP ensures the combined annual site emissions are mitigated to below regulatory thresholds. The Plan will rely on the use of alternatively powered equipment to reduce GHG emissions as compared to diesel powered equipment, as they become commercially available. However, reliance on these technologies to fully reduce GHG emissions to less-than-significant levels cannot be ensured. Similarly, although Mitigation Measure GHG-3 allows the RPs to offer offsite property owners GHG reducing measures such as energy audits, energy efficiency upgrades, solar heating, and solar photovoltaic, the implementation of these measures also cannot be ensured and the potential reductions cannot be readily quantified. Additionally, Mitigation Measure GHG-3 would require the RPs, to purchase carbon credits, which are generated when permanent, verifiable reductions in GHG emissions are achieved by the seller to offset significant GHG emissions if other mitigation measures are not successful/viable. Thus, through any combination of these measures, the project would reduce result in a less than significant impact associated with generating GHG emissions, either directly or indirectly, that may have a significant impact on the environment because the project's net GHG emissions would not exceed the significance threshold of 10,000 $MTCO_2e$ per year.

> Conclusion: The overall site cleanup would result in emissions that would not exceed regulatory thresholds with the implementation of Mitigation Measures GHG-1, GHG-2, GHG-3, EC-1, EC-2, TRANS-1, and AQ-5. Therefore, this impact would be less than significant with mitigation.

Monitoring and Maintenance

Monitoring and maintenance emissions are associated with the onsite and offsite transportation of workers, and energy associated with the consumption of electricity to run the onsite equipment, and are considered to occur at the same time as the overall site cleanup; however, because these

activities would continue past the end of remediation activities they are called out separately here for discussion purposes only.

Although monitoring and maintenance activities are anticipated to extend beyond the conclusion of overall site cleanup activities, because GHG emissions are cumulative and monitoring and maintenance activities are anticipated to occur at the same time as the overall site cleanup, emissions from the monitoring and maintenance activities are included with these activities for compliance with the applicable thresholds. As shown in Tables 4.6-2 and 4.6-3 for the overall site cleanup, the monitoring and maintenance activities would result in emission of 1,162 MT CO_2e/year. Because monitoring and maintenance occur at the same time as the overall cleanup activities and are included in the total overall site cleanup emissions, these emissions would cumulatively exceed the 10,000 metric ton threshold without mitigation. As identified in Table 4.6-3, with the incorporation of Mitigation Measures GHG-1 through GHG-3, AQ-5, EC-1, EC-2, and TRANS-1, emissions would be reduced to less-than-significant levels.

> Conclusion: Monitoring and maintenance activities are anticipated to continue after the completion of remediation activities, and once remediation activities cease, emissions associated with monitoring and maintenance activities would be below the regulatory threshold and would therefore be less than significant with mitigation.

Impact 4.6-1a Determination: *The* ***overall site cleanup*** *would not result in GHG emissions that would exceed the regulatory thresholds with mitigation. This impact would be* ***less than significant*** *with the implementation of Mitigation Measures AQ-5, TRANS-1, EC-1, EC-2, and GHG-1 through GHG-3.*

Initial Project Assessment

Impact 4.6-1b: Would the **initial activities** generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Initial Activities (Impact 4.6-1b)

As discussed in Section 3.7, *Initial Activities*, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

Total annual GHG emissions for the initial activities are shown in **Table 4.6-4** (unmitigated) and **Table 4.6-5** (mitigated) below. As shown, the total estimated GHG emissions during remediation and maintenance and monitoring would exceed the thresholds and thus mitigation measures are implemented to reduce impacts.

TABLE 4.6-4
UNMITIGATED INITIAL ACTIVITIES GHG EMISSIONS MT/YR[1]

	CO_2	CH_4	CO_2e
Initial Activities Total	16,280	690	***16,970***
Threshold (2020)			10,000
Exceeds Threshold			**Yes**
Outside of California (Max Potential)[3]			**47,349**

1 Assumes 96 trucks per day (see Section 4.6.4, Methodology, for more information about truck trip assumptions).
2 Maximum project total is the sum of the monitoring and maintenance emissions plus the initial activities.
3 Assumes all soil goes to the furthest location outside California, based on potential locations by RP.

NOTE: rows may not add exactly due to rounding.

SOURCE: ESA, 2017b (see Appendix E of this PEIR).

TABLE 4.6-5
MITIGATED INITIAL ACTIVITIES GHG EMISSIONS MT/YR[1]

	CO_2	CH_4	CO_2e
Initial Activities Total	14,863	619	***15,482***
Offsite GHG Reducing Measures and/or GHG Offsets (Mitigation Measure GHG-3)			(5,483)
Maximum Total[2]			9,999
Threshold (2020)			10,000
Exceeds Threshold			**No**
Outside of California (Max Potential)[3]			**42,586**

1 Assumes 96 trucks per day (see Section 4.6.4, Methodology, for more information about truck trip assumptions).
2 Maximum project total is the sum of the monitoring and maintenance emissions plus the initial activities.
3 Assumes all soil goes to the furthest location outside CA, based on potential locations by responsible party.

NOTE: rows may not add exactly due to rounding.

SOURCE: ESA, 2017b (see Appendix E of this PEIR).

Implementation of Mitigation Measures GHG-1, TRANS-1, EC-1, EC-2 and AQ-5 would reduce GHG emissions by limiting the vehicle emissions (either to transport debris or workers, or limiting the amount of time trucks are idling). Implementation of Mitigation Measure GHG-2 would reduce emissions by using a newer fleet and therefore reducing CO_2e emissions, as shown in Table 4.6-5.

Mitigation Measure GHG-3 requires preparation of a Greenhouse Gas Emissions Reduction Plan. The Plan will require that each RP ensures the combined annual site emissions are mitigated to below regulatory thresholds. The Plan will rely on the use of alternatively powered equipment to

reduce GHG emissions as they become commercially available. However, reliance on these technologies to fully reduce GHG emissions cannot be ensured. Similarly, although Mitigation Measure GHG-3 allows the RPs to offer offsite property owners GHG reducing measures such as energy audits, energy efficiency upgrades, solar heating, and solar photovoltaic, implementation of these measures cannot be ensured and the potential reductions cannot be readily quantified. Additionally, Mitigation Measure GHG-3 would require the RPs to purchase carbon credits, which are generated when permanent, verifiable reductions in GHG emissions are achieved by the seller. Thus, through any combination of these measures, the project would result in a less-than-significant impact associated with generating GHG emissions, either directly or indirectly, that may have a significant impact on the environment because the project's net GHG emissions would not exceed the significance threshold of 10,000 $MTCO_2e$ per year.

> Conclusion: The initial activities would not result in emissions that would exceed regulatory thresholds with the implementation of Mitigation Measures GHG-1 through GHG-3, EC-1, EC-2, TRANS-1, and AQ-5. Therefore, this impact would be less than significant with mitigation.

Impact 4.6-1b Determination: *The **initial activities** would not result in GHG emissions that would exceed the regulatory thresholds with mitigation. This impact would be **less than significant** with the implementation of Mitigation Measures AQ-5, TRANS-1, EC-1, EC-2, and GHG-1 through GHG-3.*

4.6.5.2 Plans, Policies, or Regulations Reducing Greenhouse Gas Emissions

Program Assessment

Impact 4.6-2a: Would the **overall site cleanup** conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

Overall Site Cleanup (Impact 4.6-2a)

Consistency with the CARB Scoping Plan

The overall site cleanup is a remediation project with the goal of cleaning up water and soil contamination from previous activities. The CARB Scoping Plan lays out numerous reduction strategies to be achieved at the state level, such as the Low Carbon Fuel Standard that would change the makeup of the fuel used to reduce GHG emissions. These types of policies are beyond the ability of the project to implement. Renewable energy and energy efficiency reduction strategies identified in the CARB Scoping Plan are designed for projects that have a significant amount of long-term energy consumption and building development. The overall site cleanup would not have significant energy consumption, nor would it result in the development of any buildings; ergo, the reduction measures identified in the CARB Scoping Plan that address long-term energy consumption and building development would not be relevant to the type of activities implemented by the overall site cleanup. Therefore, the overall site cleanup would not hinder implementation of the CARB Scoping Plan.

The object of the overall site cleanup is to remove or treat soils and groundwater. In support of the California Health and Safety Code (HSC), Division 25.5, the State has promulgated laws and strategies aimed at reducing GHG emissions, some of which are applicable to the cleanup activities. Consistent with HSC, the project would minimize GHG emissions by using equipment that meet stringent CARB and USEPA emissions standards, using low-carbon vehicle fuels as required under state law and prohibiting diesel-fueled commercial motor vehicle idling consistent with CARB requirements.

Since HSC Division 25.5 sets statewide targets for future GHG emissions, the Scoping Plan and other implementing tools of the law are clear that the reductions are not expected to occur uniformly from all sources or sectors. The following are CARB GHG-reduction strategies applicable to the overall site cleanup:

- HSC Section 42823 and 43018.5 (Pavley Regulations): Pavley Regulations reduce GHG emissions in new passenger vehicles from model years 2012 through 2025 as well as reducing gasoline consumption to a rate of 31 percent of 1990 gasoline consumption (and associated GHG emissions) by 2020. While the project does not have control over commuter vehicles, the overall site cleanup would not interfere with implementation of the emission standards because light-duty vehicles and commuter vehicles would meet the standards in the law based on vehicle age.
- Low Carbon Fuel Standard: The Low Carbon Fuel Standard establishes protocols for measuring life-cycle carbon intensity of transportation fuels and helps to establish use of alternative fuels. The project would be consistent with this regulation and would not conflict with implementation of the transportation fuel standards, as vehicles used by workers and visitors would use fuels that meet the standards codified in this state law.
- CARB Air Toxics Control Measure: This measure reduces diesel-fueled commercial motor vehicle idling. The overall site cleanup would be consistent with the CARB Air Toxics Control Measure to limit heavy-duty diesel motor vehicle idling to no more than 5 minutes at any given time as required by law.

  Conclusion: Because the overall site cleanup would not conflict with strategies to reduce GHG emissions, it would be consistent with the overarching regulation to reduce GHG emissions. Therefore, project impacts would be less than significant.

Consistency with SB 375

The key goal of the SCS is to achieve GHG emissions reduction targets through integrated land use and transportation strategies. The focus of these reductions is on transportation and land use strategies that influence vehicle travel. The overall site cleanup is a remediation project that would occur over approximately 15 years and would result in worker commute traffic and truck traffic. While the overall site cleanup would result in a temporary increase in traffic, it would not result in permanent traffic increases for the region. Additionally, SB 375 was designed with respect to land use and regional growth and not for remediation-type projects. Therefore, because traffic increases would be temporary and the overall site cleanup would not contribute to regional growth, it would not interfere with the achievement of SB 375 goals, and impacts would be less than significant.

Conclusion: Because traffic increases would be temporary and the overall site cleanup would not contribute to regional growth, it would not interfere with the achievement of SB 375 goals, and impacts would be less than significant.

City of Los Angeles General Plan

The Los Angeles City General Plan goals are directed toward the reduction of air quality impacts; however, they also accomplish reductions in GHG emissions. These goals result in reduced GHG emissions by decreasing vehicle emissions and increasing energy efficiencies, typically associated with development projects. Although, the project site is not located within the City of Los Angeles, implementation of Mitigation Measures GHG-1 and TRANS-1 would further reduce project-related vehicle emissions. Because the project is not located within the City of Los Angeles and therefore is not governed by the City of Los Angeles General Plan, impacts would be less than significant, without mitigations.

Conclusion: Although, the project site is not located within the City of Los Angeles, implementation of Mitigation Measures GHG-1 and TRANS-1 would further reduce project-related vehicle emissions. Because the project is not located within the City of Los Angeles and therefore is not governed by the City of Los Angeles General Plan, impacts would be less than significant, without mitigation.

County of Los Angeles General Plan

The Los Angeles County General Plan policies are directed toward the reduction of air quality impacts; however, they also accomplish reductions in GHG emissions. These policies result in reduced GHG emissions by decreasing vehicle emissions and increasing energy efficiencies and are mainly associated with typical development projects. The proposed project's energy use would be from cleanup activities and would reduce once excavation activities have been completed. Energy efficiency measures that are used with typical development projects are not applicable to the cleanup activities. However, implementation of Mitigation Measures GHG-1 and TRANS-1 would further reduce project-related vehicle emissions. Because the measures in the General Plan are not applicable to the project, impacts would be less than significant without mitigation.

Conclusion: Although, the project site is not located within the County of Los Angeles, implementation of Mitigation Measures GHG-1 and TRANS-1 would further reduce project-related vehicle emissions. However, because the measures in the General Plan are not applicable to the project, Impacts would be less than significant without mitigation.

Ventura County General Plan

The Ventura County General Plan has no policies that specifically identify measures to reduce GHG emissions; however, it does identify policies related to air quality emissions that also reduce GHG emissions. The overall site cleanup would comply with Policy 1.2.2-3 through the implementation of Mitigation Measures AQ-5 and GHG-1 through GHG-3. Policy 1.2.2-5 restates the requirement to follow all APCD rules and permit requirements. The overall site cleanup activities would comply with APCD requirements, including VCAQMD Rule 10 which

requires a permit to construct. Therefore, the overall site cleanup would be consistent with the Ventura County General Plan policies and impacts would be less than significant.

> Conclusion: The overall site cleanup activities would comply with APCD requirements, including VCAQMD Rule 10 which requires a permit to construct. Therefore, the overall site cleanup would be consistent with the Ventura County General Plan policies and impacts would be less than significant.

Simi Valley General Plan

The provisions of the Simi Valley General Plan pertain to typical development projects and City departments. The overall site cleanup is not located within the City of Simi Valley, but it would result in vehicle travel (and thus generation of emissions) within the city potentially from both worker commutes and truck trips. Based on the temporary duration of project emissions and the energy reduction measures that would be incorporated into the project (such as use of Tier 4 final equipment and onsite—and potentially offsite—carpooling/vanpooling strategies), the overall site cleanup would not conflict with the sustainability goals. Additionally, the site would further protect groundwater under the site and thus would foster Strategy B-2 to conserve and improve water supply. Therefore, impacts would be less than significant.

> Conclusion: The overall site cleanup would not conflict with the sustainability goals. Additionally, the site would further protect groundwater under the site and thus would foster Strategy B-2 to conserve and improve water supply. Therefore, impacts would be less than significant.

Impact 4.6-2a Determination: *The* ***overall site cleanup*** *would not conflict with the implementation of applicable plans, policies, or regulations for the purpose of reducing GHG emissions. This impact would be* ***less than significant****.*

Initial Project Assessment

Impact 4.6-2b: Would the **initial activities** conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

Initial Activities (Impact 4.6-2b)

As discussed in Section 3.7, *Initial activities*, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure

- Area II Impoundment Post-Closure

As GHG emissions are cumulative in nature, the initial activities would be combined with the overall site cleanup with respect to GHG emissions. Additionally, the nature and type of the initial activities are the same as those described for the overall site cleanup. The initial activities would implement all of the same project features with respect to fuel and energy use as the overall site cleanup and would implement the same mitigation. Thus, as discussed in detail for the overall site cleanup (Impact 4.6-2a), the initial activities would not conflict with the implementation of applicable plans policies or regulations for the purpose of reducing GHG emissions. Therefore, the impacts would be less than significant.

> Conclusion: The initial activities would not conflict with the implementation of applicable plans, policies or regulations for the purpose of reducing GHG emissions. Therefore, this impact would be less than significant.

Impact 4.6-2b Determination: *The* ***initial activities*** *would not conflict with the implementation of applicable plans, policies, or regulations for the purpose of reducing GHG emissions. This impact would be* ***less than significant****.*

4.6.6 Mitigation Measures[6]

The California Air Pollution Control Officers Association (CAPCOA) guidance document, *Quantifying Greenhouse Gas Mitigation Measures*, includes recommended mitigation measures for potentially reducing GHG emissions from heavy-duty construction equipment (CAPCOA, 2010). CAPCOA Measure C-1 recommends consideration of alternative fuels for construction equipment. However, according to Table C-1.1 in the CAPCOA guidance, emissions of CO_2e could potentially increase for certain equipment by switching from gasoline or diesel to compressed natural gas.[7] As discussed previously, the project would be consistent with the State's Low Carbon Fuel Standard regulation and would not conflict with implementation of the transportation fuel standards, as vehicles used by workers and visitors would use fuels that meet the standards codified in this state law. Compliance with the Low Carbon Fuel Standard would be consistent with this CAPCOA recommendation and would ensure that specifically low carbon fuels are used in accordance with state requirements, as opposed to "alternative fuels" that may potentially increase GHG emissions.

CAPCOA Measure C-2 recommends consideration of electric or hybrid construction equipment. Mitigation Measure GHG-3 below would be consistent with the general intent of this CAPCOA recommendation.

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6 Some of the mitigation measures in this section include recommendations from USEPA's *Green Remediation: Best Management Practices for Excavation and Surface Restoration*, December 2008.

7 For example, Table C-1.1 of the CAPCOA guidance document reports the emissions reductions from switching from gasoline to compressed natural gas. Aerial Lifts <15 HP are shown to have a negative reduction (i.e., a double-negative, or an increase) of CO_2e emissions by 27 percent. All negative values shown in this table correspond to an emissions increase.

CAPCOA Measure C-3 recommends limiting idling beyond regulatory requirements. The CARB Air Toxics Control Measure that limits idling (Title 13 California Code of Regulations, Section 2485) applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds that are licensed to operate on highways. Mitigation Measure AQ-5 (see Section 4.2.6) would prohibit the idling of on-road and off-road heavy-duty diesel vehicles for more than five minutes at a time. As Mitigation Measure AQ-5 applies to both on-road and off-road equipment, the measure is thus more stringent than regulatory requirements; therefore, the project would be consistent with CAPCOA recommendations.

CAPCOA Measures C-4 and C-5 recommends implementing a tracking system for construction equipment and construction vehicles to ensure compliance with other emissions control measures. Mitigation Measures AQ-5 and GHG-3 would require that construction equipment and construction vehicle documentation be maintained indicating each unit's certified emissions levels. In addition, Mitigation Measure TRANS-1 would establish a DTSC approved-traffic plan that establishes the trucking route, days and hours of truck operation, the maximum number of trucks per day, and various safety requirements. Therefore, implementation of Mitigation Measures AQ-5, GHG-3, and TRANS-1 would generally serve the intent of CAPCOA Measures C-4 and C-5.

Alternative-fueled equipment, including currently commercially available equipment powered by biodiesel, natural gas, and electric engines, were evaluated in detail as potential strategies to reduce emissions, and were determined to not be feasible for implementation with this project at this time. A discussion of the infeasibility of alternative-fueled equipment for this project is provided in the *Santa Susana Field Laboratory Project EIR Feasibility of Alternative-Fueled Construction Equipment and Trucks Memorandum*, which is provided in Appendix D of this PEIR (ESA, 2017a).

As detailed in this memorandum, while alternative fuels and associated alternative-fueled equipment are available, such fuels and equipment are not feasible for implementation for this project, based on the current state of the availability and emissions reduction potential for these technologies. Although the use of biodiesel would reduce CO_2 and PM emissions, biodiesel would not decrease, and in fact may slightly increase NO_X emissions, the criteria pollutant for which project emissions exceed the regional significance thresholds (refer to Section 4.2, *Air Quality*, of this PEIR).

Emissions of NO_X contribute to the formation of ground-level ozone and the SCCAB and the SCAB are designated as non-attainment for the federal and state ozone standards. Therefore, biodiesel would not be feasible for this project, as it may cause an increase in an identified significant air quality impact. Compressed or liquefied natural gas (CNG/LNG) trucks are available, but lack the torque (power output) needed for the hauling of materials from the project site to appropriate receiver facilities and would not be feasible for this project.

Also, as noted in Table C-1.1 in the CAPCOA guidance, emissions of CO_2e could potentially increase for certain equipment by switching from gasoline or diesel to compressed natural gas.[8] In addition, electric engines were considered; however, due to the daily relocation of equipment throughout the project site and the need for trucks to travel long distances away from the project site, lack of charging stations in proximity to daily cleanup locations, and downtime for recharging, electric equipment was determined to be not feasible for this project. As a result, there are currently no feasible mitigation measures related to alternative-fueled equipment that would further reduce emissions of GHGs beyond those measures already incorporated into the project. However, as technology advances, viable alternatives to the diesel-powered on-road or off-road equipment needed to implement the project may become commercially available.

Given the above, the following measures shall be implemented to mitigate impacts related to GHG emissions:

AQ-5: Prohibit Idling (see Section 4.2.6).

TRANS-1: Site-Wide Traffic Management Plan (see Section 4.11.6).

EC-1: Energy Conservation Program (see Section 4.13.6).

EC-2: Energy Conservation – New Onsite Equipment (see Section 4.13.6).

GHG-1: Recycling Requirement. To the maximum practical extent, recyclable materials, including non-hazardous debris, shall be reused or recycled.

GHG-2: On-Road Vehicle Fleet Requirements. The RPs (and their contractors), under the direction of DTSC, shall use trucks that are model year 2014 or newer or are certified to meet the emissions standards of a 2014 or newer on-road diesel heavy-duty vehicle. A copy of each unit's certified tier specification, BACT documentation, and CARB or SCAQMD operating permit shall be provided at the time of mobilization of each applicable unit of equipment. This requirement must be included in bid documents with the appropriate contractors and subcontractors.

GHG-3: Greenhouse Gas Emissions Reduction Plan. Before physical implementation of the project begins, the RPs, under the direction of DTSC, shall develop and implement a Greenhouse Gas Emissions Reduction Plan (GHG Plan) containing feasible strategies to reduce GHG emissions for the project to a less-than-significant level. As part of the GHG Plan, the RPs, under the direction of DTSC, shall require contractors implementing the cleanup activities to track hours, miles, fuel usage, or other suitable surrogate parameters related to the cleanup and calculate and report the resultant GHG emissions every month. Based on information obtained through this tracking system, the plan shall require the RPs, under the direction of DTSC, to implement, as needed, specifically identified measures to ensure that the project would not exceed, on a 12-month rolling basis, the threshold 10,000 $MTCO_2e$. The measures shall include, but not be limited to, one or more of the following:

[8] For example, Table C-1.1 of the CAPCOA guidance document reports the emissions reductions from switching from gasoline to compressed natural gas. Aerial Lifts <15 HP are shown to have a negative reduction (i.e., a double-negative, or an increase) of CO_2e emissions by 27 percent. All negative values shown in this table correspond to an emissions increase.

- Seek opportunities for California forest preservation and the planting of new drought-tolerant, high-carbon sequestering, and/or native trees of appropriate size and type for properties in California, including in disadvantaged communities or land uses such as parks serving disadvantaged communities either onsite or offsite in Ventura County, Los Angeles County, or other counties where project-related emissions occur, that would result in a net sequestration of CO_2 emissions.
- Seek opportunities for offsetting GHG emissions from existing sources, including sources located in disadvantaged communities or sources serving disadvantaged communities in Ventura County, Los Angeles County, or other counties where project-related emissions occur. Examples may include but are not limited to implementing methane capture and destruction programs at dairy farms, coordinating with local transportation agencies and property owners and establishing electric vehicle supply equipment (EVSE) at park-and-ride lots or other appropriate locations, coordinating with local transportation agencies and school districts and replacing diesel- or gasoline-fueled buses with less-polluting technologies such as compressed natural gas, electric, hybrid-electric, fuel cell, or other commercially available technologies, or other GHG emissions offset programs.
- Review, at least once a year, commercial availability and feasibility of alternatives to diesel-powered on-road and off-road equipment. If commercially available and feasible in the region, contractors shall be required to use equipment capable of performing the cleanup activities in a comparable manner (with respect to time, safety, equipment power requirements, etc.), which results in appreciable GHG reductions, but does not result in the increase of criteria pollutant emissions to above daily regional thresholds.
- Purchase carbon credits from a reputable carbon market. Priority should be given to those credits generated within the vicinity of SSFL, and in decreasing preference, credits generated within the region, in-state, and out-of-state.

The plan shall devise mitigation with a priority on fiscal considerations in order to reserve project funds, to the extent feasible, for actual cleanup activities. The plan may also include provisions to seek grant funding or other mechanisms to leverage other existing programs that address energy reduction or urban forestation.

4.6.7 Impact Summary

Table 4.6-6 summarizes the impacts and significance determinations associated with the overall site cleanup and initial activities related to GHG emissions.

TABLE 4.6-6
SUMMARY OF IMPACTS – GHG

Impact	Overall Project	DOE Initial Project	NASA Initial Project	DOE Demolition Activities	RCRA Post-Closure and Facility Closure	Mitigation Measures
Impact 4.6-1a: Generate significant GHG emissions	LSM	--	--	--	--	AQ-5, EC-1, EC-2, TRANS-1, GHG-1, GHG-2, and GHG-3
Impact 4.6-1b: Generate significant GHG emissions	--	LSM	LSM	LSM	LSM	AQ-5, EC-1, EC-2, TRANS-1, GHG-1, GHG-2, and GHG-3
Impact 4.6-2a: Conflict with plans or policies for reducing GHG emissions	LTS	--	--	--	--	None
Impact 4.6-2b: Conflict with plans or policies for reducing GHG emissions	--	LTS	LTS	LTS	LTS	None

LSM = Less than significant with mitigation incorporated
LTS = Less than significant

4.7 Hazards and Hazardous Materials

This section analyzes the potential impacts associated with hazards and hazardous materials relevant to the overall site cleanup and the initial activities. The existing hazards and hazardous materials setting is described, along with the relevant regulatory background. The analysis of impacts in this section is prepared based on review of available reports.

4.7.1 Environmental Setting

4.7.1.1 Definition of Hazardous Materials

A hazardous material is defined as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment (Health and Safety Code Chapter 6.95, Section 25501(n)). The term "hazardous materials" includes, among other things, hazardous substances, hazardous wastes and radioactive materials. Under federal and state laws, any material, including wastes, may be considered hazardous if it is specifically listed by statute as such or if it is toxic (causes adverse human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases).

Hazardous wastes that no longer have practical use, such as materials that have been spent, discarded, discharged, spilled, contaminated, or are being stored until they can be disposed of properly (Title 22 CCR Section 66261.10). Soil containing hazardous materials is a hazardous waste if it exceeds specific 22 CCR criteria (Sections 66261.20 through 66261.31). While hazardous substances are regulated by multiple agencies, as described later in the Regulatory Setting subsection, cleanup requirements of hazardous wastes are determined on a case-by-case basis according to the agency with lead jurisdiction over the project.

Preschools, schools, daycare centers, nursing homes, and hospitals are considered sensitive receptors for hazardous materials because children and the elderly are more susceptible than adults are to the effects of many hazardous materials. Additionally, the State of California recognizes acute and chronic exposure to Toxic Air Contaminants (TACs) while at home or work may also pose a health risk; therefore, residents and workers are considered sensitive receptors in health risk assessments (HRAs) and other impact assessments.

4.7.1.2 Hazardous Building Materials Associated with Demolition

Chemicals and radionuclides were used for research and development at SSFL, and some surfaces within some of the buildings may contain residual chemicals and radionuclides from those previous uses. In addition, because of the age of many of the facilities within the project site, the potential exists for the facilities to contain hazardous building materials. Older facilities can contain building materials that include hazardous components such as lead-based paint (LBP), asbestos-containing materials (ACMs), mercury, and polychlorinated biphenyls (PCBs).

Prior to the USEPA ban in 1978, LBP was commonly used on interior and exterior surfaces of buildings. Old peeling paint can contaminate near-surface soil, and exposure to residual lead has resulted in illness in children.

Asbestos is a naturally occurring fibrous material that was extensively used as a fireproofing and insulating agent in buildings constructed before such uses were banned by USEPA in the 1970s. The demolition of facilities with ACM can result in airborne fibers. Inhalation of the tiny asbestos fibers can lead to lung disease.

Spent fluorescent light tubes commonly contain mercury vapors. In February 2004, regulations took effect in California that classified all fluorescent lamps and tubes as hazardous waste. When these lamps or tubes are broken, mercury is released to the environment. Mercury can be absorbed through the lungs into the bloodstream, and can be washed by rainwater into waterways. Mercury switches may also be present in some buildings. A mercury switch (also known as a mercury tilt switch) is a switch that opens and closes an electrical circuit through a small amount of liquid mercury.

PCBs are organic oils that were formerly used primarily as insulators in many types of electrical equipment, such as transformers, capacitors, and fluorescent lighting ballasts. After PCBs were determined to be carcinogenic in the mid-to-late 1970s, the USEPA banned PCB use in most new equipment and began a program to phase out certain existing PCB-containing equipment. Transformers, capacitors, and fluorescent lighting ballasts manufactured after January 1, 1978, do not contain PCBs and are required to have a label clearly stating that PCBs are not present in the unit.

4.7.1.3 Chemicals and Radionuclides Released at Project Site

As discussed in Section 2.2, *Background*, of this PEIR, the past operational activities at SSFL resulted in releases of chemicals and radionuclides to soil, groundwater, and surface water at the project site (MHW, 2004). Several hundred chemicals have been used at the project site at one time or another. **Table 4.7-1** includes a summary of the types of chemicals used for SSFL operations.

Operations at the site included research, development, testing of liquid-propellant rocket engines, water jet pumps, lasers, liquid metal heat exchanger components, nuclear energy, and related technologies. Rocket engine testing was conducted in six rocket engine test areas that primarily used petroleum-based fuels (e.g., jet fuel, kerosene) and liquid oxygen as an oxidizer or hydrazine based fuels. Solvents, primarily trichloroethene (TCE), were used for cleaning of engine components; TCE use was discontinued in the early 1990s. The laboratories, chemical storage areas, equipment assembly, and maintenance facilities that supported the operations were located throughout the project site and were used to supply different chemicals for testing operations, or to conduct small-scale testing of materials.

TABLE 4.7-1
CHEMICAL USE AND WASTES GENERATED AT SSFL

Chemical or Waste Category	Use	Types of Chemicals Used/Stored/Produced
Petroleum test fuels	Large engine and component systems testing	RP-1 (kerosene), JP-4 (jet fuel)
Storable test fuels	Small engine and component testing	monomethyl hydrazine, unsymmetrical dimethyl hydrazine, hydrazine derivatives, N-nitrosodimethylamine
Oxidizers	Engine and component system testing	nitrogen tetraoxide, inhibited red fuming nitric acid, liquid oxygen, and fluorine compounds
Solvents	Cleaning	TCE, tetrachloroethene (PCE), 1,1,1-trichloroethane, 1,1-dichloroethane (DCA), chloroflurocarbons (Freon compounds), 1-4 dioxane
Caustic and acidic solutions	Laboratory testing	potassium hydroxide, sodium hydroxide, hydrochloric and other acids
Scrap metals	Construction	copper, lead, zinc, etc.
Polychlorinated biphenyls	Pre-1980 transformers, waste oils	primarily aroclor 1254/1260 mixtures
Petroleum fuel and solvent burn products	Generated through burning practices	polyaromatic hydrocarbons and dioxins/furans
Solid propellants and energetic compounds	Igniters and energetic testing	perchlorate, beryllium, gycidyl azide polymer, RDX, HMX, and C-4
Vehicle fuels	Transportation	petroleum hydrocarbons (gasoline-, diesel, and kerosene-range fuels)
Waste oil	Maintenance operations, lubricating oils	petroleum hydrocarbons (oils and lubricants)
Construction debris	Construction	concrete, asphalt, wood, scrap metal, and asbestos, lead-based paint
“Green liquor” wastewater	Coal gasification processes	water containing organic and sulfur compounds, and ash (generated from coal gasification operations)
Incinerator ash	Refuse burning (paper, wood, etc.)	Polynuclear aromatic hydrocarbons and dioxins
Photographic waste	Photo and x-ray development	silver
Radioactive materials	Nuclear energy research	americium-241; cesium-137; cobalt-60; curium-243/244; europium-152 and -154; nickel-59; plutonium-238 and -239/240, strontium-90, and tritium
Lead Shot	Rocketdyne-Atomics International Rifle and Pistol Club Trap and Skeet shooting range	lead
Nuclear energy research insulating liquids	Area IV nuclear energy, research, and testing	Sodium, potassium, mercury
Pyrophoric material	Ignition source	triethylaluminum / triethyl boron
Biocides	Control algal growth in ponds	sodium hypochlorite

SOURCES: ICF, 1993a, b, c; SAIC 1991; Ogden 1996; MWH, 2004.

Liquid chemicals were historically stored in various types and sizes of containers and vessels, including drums, aboveground storage tanks, and underground storage tanks. Solid or powdered chemicals used at SSFL were stored in drums or small containers and typically kept in buildings or above-grade storage pads. Equipment assembly was typically performed inside buildings and involved only minimal chemical use.

Among the hazardous materials used at SSFL, petroleum fuels and chlorinated solvents were used in large volumes. Petroleum hydrocarbons were used as fuel for many of the liquid-propellant rocket engine tests. Chlorinated solvents, primarily TCE, were used following engine tests to clean elements of the rocket engines (e.g., thrust chambers) and for other equipment degreasing operations. Another solvent used in lesser quantities, 1,1,1-trichloroethane, contained 1,4-dioxane as a stabilizer to increase the longevity and usefulness of the solvent. Based on facility records, 1,4-dioxane was not added to the TCE as a stabilizer for rocket engine testing operations at the SSFL because it also caused an undesirable residue on engine components that did not meet specifications. Solid propellants, including perchlorate compounds, were used at the SSFL for research and testing operations. Perchlorate was used in relatively small quantities as an oxidizer for the production of turbine spinners and igniters; for research, development, and production of flares; and for small-scale solid-propellant rocket motor research, development, and testing. PCBs were present in some waste oils, and oils within pre-1980 electrical transformers at various locations within the SSFL. Various metals may have been used in machining operations, or stored or disposed as construction debris.

In addition, other chemicals may have entered the environment as by-products of operations at the SSFL. The periodic burning of petroleum fuels that accumulated in the ponds located onsite may have produced dioxins (i.e., polychlorinated dibenzodioxins and dibenzofurans) that are toxic to humans

In the past, radioactive materials were used at SSFL for research and development purposes, and as a result, there are known, limited areas of the site where radioactive materials ae present in concentrations that require clean-up. The EIS that DOE prepared for its portion of the project (DOE, 2017) presents a detailed assessment of these areas, along with specific radioisotopes that are present in demolition materials and soil. The RPs have conducted many investigations at SSFL, which have resulted in identifying the specific chemicals and radionuclides associated with SSFL activities. To delineate and quantify the areas to be remediated, cleanup requirements were developed that provide a specific concentration for each chemical and radionuclide in each area that would require cleanup. The nuclear research conducted in Area IV also resulted in the release of radioactive elements to the environment (DOE, 2017). The eleven radionuclides detected in soil samples and attributed to past SSFL activities include: americium-241; cesium-137; cobalt-60; curium-243/244; europium-152 and -154; nickel-59; plutonium-238 and -239/240, strontium-90, and tritium (HydroGeoLogic, 2012). Strontium-90 and tritium attributed to SSFL activities have also been detected in groundwater (DOE, 2014).

As required by DTSC, the RPs have conducted many investigations at SSFL and continue to further investigate the nature and extent of these past releases. These investigations have

identified the specific chemicals and radionuclides associated with SSFL activities. To delineate and quantify the areas to be remediated, cleanup requirements were developed that provide a specific concentration for each chemical and radionuclide in each area that would prompt cleanup, as discussed further in Sections 2.2.3.5, *Soil Cleanup Requirements*, and 2.2.3.6, *Groundwater Cleanup Requirements*, of this PEIR, which discuss the cleanup requirements for soil and groundwater, respectively. Appendix B of this PEIR provides the cleanup requirements for each of the chemicals and radionuclides of concern.

4.7.1.4 Toxic Air Contaminants

TACs are pollutants that may result in an increase in mortality or serious illness, or that may pose a present or potential hazard to human health. Health effects of TACs include cancer, birth defects, neurological damage, damage to the body's natural defense system, and diseases that lead to death. Many of the chemicals listed in Table 4.7-1 are recognized by the State of California as TACs.[1] In 1998, following a 10-year scientific assessment process, CARB identified diesel particulate matter (DPM) as a TAC. Although many different TACs occur throughout the region, DPM is the largest contributor to health impacts in the region. Compared to other air toxics CARB has identified, DPM emissions are estimated to be responsible for about 70 percent of the total ambient air toxics risk (CARB, 2016).

In May 2015, the South Coast Air Quality Management District (SCAQMD) completed the Multiple Air Toxics Exposure Study IV (MATES IV). MATES IV is a monitoring and evaluation study conducted in the SCAB and is a follow up to previous air toxics studies. The study is a follow up to the 2008 MATES III study and consists of several elements including a monitoring program, an updated emissions inventory of toxic air contaminants, and a modeling effort to characterize risk across the SCAB. The study focuses on the carcinogenic risk from exposure to air toxics. However, it does not estimate mortality or other health effects from particulate exposures. MATES IV shows that the region adjacent to the project site area has an estimated carcinogenic risk of approximately 370 in a million (SCAQMD, 2015a). These model estimates were based on monitoring data collected at 10 fixed sites within the SCAB. The MATES IV study includes the most recent OEHHA health risk calculation guidance, which include age sensitivity factors and updated breathing rates.

4.7.1.5 Sensitive Receptors and Locations

The nearest offsite sensitive receptors are the park ranger's house in Sage Ranch Park, located adjacent to the project site within Ventura County, the residential communities located approximately 1 mile north of the site, 0.3 mile east of the site, and in Bell Canyon located directly south of the project site. The Bell Canyon residences are approximately 0.5 mile from the nearest areas of onsite disturbance. Scattered residences are also located approximately 1 mile west of the site. As the project site is adjacent to the border with Los Angeles County, and the haul routes traverse through Los Angeles County to reach their destination, the residential and

[1] California Air Resources Board List of TACs. https://www.arb.ca.gov/toxics/id/taclist.htm; Accessed March 2017.

school receptors along the haul routes are also considered sensitive receptors and are included in this analysis.

Depending on the specific disposal site receiving waste from the cleanup, the potential exists for the haul routes to travel within a quarter mile of schools, residents and other sensitive receptors. However, the number of trucks traveling past these receptors would be less than analyzed for receptors in this analysis. This is because each RP would select a disposal site based on the type of soil contamination. Therefore, all trucks would not end up at the same disposal site. Because the number of trucks accessing disposal sites would be less than those analyzed herein, and impacts from onsite activities diminish as from the site increases, impacts at these remote locations would be less than what is reported in this analysis. Therefore, while it is acknowledged that there are other sensitive receptors along the routes to the disposal sites, they are not analyzed because the impacts analyzed herein represents the most conservative risk and exposure potential.

Proximity to Schools and Day Care Centers

There are no schools within one-quarter mile of the project site. However, as discussed in Section 4.11, *Transportation and Traffic*, of this PEIR, four surface road routes would be used to access the project site, which are within one-quarter of a mile of schools. The transportation routes exit the project site at the eastern entrance to Woolsey Canyon Road. Trucks would travel to SR 118 or US 101 via the following routes, as shown in Figure 3-7:

- Route 1: Woolsey Canyon to Valley Circle Boulevard to Roscoe Boulevard to Topanga Canyon Boulevard (SR 27) to SR 118
- Route 2: Woolsey Canyon to Valley Circle Boulevard to Lake Manor Drive to Valley Circle Boulevard to Plummer Avenue to Topanga Canyon Boulevard (SR 27) to SR 118
- Route 3: Woolsey Canyon to Valley Circle Boulevard to US 101
- Route 4: Woolsey Canyon to Valley Circle Boulevard to Roscoe Boulevard to Topanga Canyon Boulevard (SR 27) to US 101

The following schools and day care centers are located within one-quarter mile of the proposed routes:

Routes 1 and 2 to SR 118:

- Casa Dei Maria Montessori School (8230 Fallbrook Avenue in West Hills along Roscoe Boulevard)
- Valley College of Medical Careers (8399 Topanga Canyon Boulevard in West Hills)
- Nevada Avenue Elementary School (22120 Chase Street in West Hills along Topanga Canyon Boulevard)
- Chatsworth Park Elementary School (22005 Devonshire Street in Chatsworth along Topanga Canyon Boulevard)
- Oakridge Preschool (10433 Topanga Canyon Boulevard in Chatsworth)
- Montessori of Chatsworth (10616 Andora Avenue in Chatsworth along Topanga Canyon Boulevard)

Routes 3 and 4 to US 101:

- Ivy Academia Entrepreneurial Charter School, 7353 Valley Circle Boulevard, West Hills
- West Hills Montessori, 24373 Vanowen Street, West Hills
- Stepping Stones Montessori, 24385 Vanowen Street, West Hills
- Hill Point Montessori Preparatory School, 6601 Valley Circle Boulevard, West Hills
- St. Bernardine Children's Center, 24425 Calvert Street, Woodland Hills
- St. Bernardine of Siena Catholic School, 6061 Valley Circle Boulevard, Woodland Hills
- Temple Aliyah Jewish Preschool and Early Childhood Education Center, 6025 Valley Circle Boulevard, Woodland Hills
- El Camino Real Charter High School, 5440 Valley Circle Boulevard, Woodland Hills

4.7.1.6 Emergency Response and Evacuation Plans

As described in Section 3.4.2, *Infrastructure*, of this PEIR, paved road access to the project site is from Woolsey Canyon Road or Black Canyon Road from the north, both of which feed into Service Area Road, the only paved access point at the eastern end of the project site.

Woolsey Canyon Road feeds into Valley Circle Boulevard in Los Angeles County. The Los Angeles County Department of Public Works (LACDPW) provides the local area map showing the designated emergency routes, which are a part of emergency response and evacuation plans (LACDPW, 2012). Portions of Valley Circle Boulevard (Victory Boulevard to US 101, and Roscoe Boulevard to Devonshire Street) and the segment of Roscoe Boulevard from Valley Circle Boulevard to Woodlake Avenue are part of a designated Secondary Disaster Route. US 101 SR 218, and SR 27 (Topanga Canyon Boulevard) are Primary Disaster Routes. The Ventura County Office of Emergency Services (VCOES) does not produce designated disaster or evacuation route maps other than for tsunami zones along the coast (VCOES, 2015).

4.7.1.7 Potential for Wildfires

The State of California maps areas that are considered Fire Hazard Severity Zones (FHSZs) throughout the state, including Ventura County. The FHSZs are based on an evaluation of fire history, existing and potential fuel, flame length, blowing embers, terrain, weather, and the likelihood of buildings igniting (California Department of Forestry and Fire Protection [CALFIRE], 2015). The project area has been mapped as a very high FHSZ area (CALFIRE, 2007). Such areas tend to be outside of the urban developed areas in areas with flammable vegetation, such as brush.

4.7.2 Regulatory Setting

4.7.2.1 Federal

Primary federal agencies with responsibility for hazardous materials management include the USEPA, Department of Labor (OSHA), and Department of Transportation (USDOT). Major

federal laws and issue areas include the following statutes and regulations promulgated there under:

- Resource Conservation and Recovery Act (RCRA) 42 USC 6901 et seq. – RCRA is the principal law governing the management and disposal of hazardous wastes. RCRA addresses all aspects of hazardous wastes from creation to disposal. RCRA applies to this program because RCRA is used to define hazardous wastes; offsite disposal facilities and the wastes each may accept are regulated under RCRA. In addition, the DOE and NASA portions of the project site are under federal jurisdiction; investigation and cleanup for federal areas are regulated under RCRA.
- Emergency Planning and Community Right-to-Know Act (EPCRA from SARA Title III) – EPCRA improved community access to information regarding chemical hazards and facilitated the development of business chemical inventories and emergency response plans. EPCRA also established reporting obligations for facilities that store or manage specified chemicals. EPCRA applies to this program because the contractors that conduct cleanup, remove hazardous materials from the project site, and construct remediation systems will be required to prepare and implement written emergency response plans to properly manage hazardous materials and respond to accidental spills.
- USDOT Hazardous Materials Transportation Act of 1975 (49 USC 5101) – USDOT, in conjunction with the USEPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to safe storage and transportation of hazardous materials. CFR 49, 171–180, regulates the transportation of hazardous materials, types of material defined as hazardous, and the marking of vehicles transporting hazardous materials. This Act applies to this program because contractors will be required to comply with its storage and transportation requirements that would reduce the possibility of spills.
- The Federal Motor Carrier Safety Administration (49 CFR Part 383-397) – The Federal Motor Carrier Safety Administration, a part of the USDOT, issues regulations concerning highway transportation of hazardous materials, the hazardous materials endorsement for a commercial driver's license, highway hazardous material safety permits, and financial responsibility requirements for motor carriers of hazardous materials. This Act applies to this program because contractors will be required to comply with its storage and transportation requirements that would reduce the possibility of spills.
- U.S. Nuclear Regulatory Commission (USNRC) Packaging and Transportation of Radioactive Material (10 CFR 71) – For radioactive materials that do not meet the USNRC exemption for radioactive materials, such materials shall be required to comply with the packaging and transportation requirements of the USNRC in 10 CFR 71. These regulations establish the requirements for packaging, preparation for shipment, and transportation of licensed material, and the procedures and standards for USNRC approval of packaging and shipping procedures for fissile material and for a quantity of other licensed material in excess of a Type A quantity.
- Occupational Safety and Health Administration (OSHA; 29 USC 15) – OSHA is the federal agency responsible for ensuring worker safety. These regulations provide standards for safe workplaces and work practices, including those relating to hazardous materials handling. OSHA applies to this program because contractors will be required to comply with its hazardous materials management and handling requirements that would reduce the possibility of spills.

4.7.2.2 State

The primary state agencies with jurisdiction over hazardous materials management are DTSC and Los Angeles Regional Water Quality Control Board (LARWQCB). The majority of the characterization work conducted at the project site has been performed under a RCRA Corrective Action program and State Superfund program, as enforced by the 2007 Consent Order and 2010 AOCs. Other State agencies involved in hazardous materials management are the Department of Industrial Relations (State OSHA implementation), State Office of Emergency Services (OES) California Accidental Release Prevention (CalARP) implementation, CARB, Caltrans, State Office of Environmental Health Hazard Assessment (OEHHA) Proposition 65 implementation, and California Department of Resources Recycling and Recovery (CalRecycle). Hazardous materials management laws in California include the following statutes and regulations promulgated there under.

- California Hazardous Waste (aka "Non-RCRA Hazardous Waste") and California Code of Regulations (CCR) Title 22 – Title 22 identifies and lists hazardous wastes and standards applicable to generators and transporters of hazardous waste. It provides standards for owners and operators of hazardous waste transfer, treatment, storage and disposal facilities. Title 22 establishes the minimum standards for management of hazardous waste. It also governs enforcement and inspections. Selection and ranking criteria for hazardous waste sites requiring remedial action are identified. It governs site and facility cleanup, corrective action, and site remediation. The CCR title 22 is the state equivalent of Code of Federal Regulations title 40 and regulates the generation, treatment, storage, and disposal of hazardous waste.
- California Code of Regulations Title 23 – Title 23 addresses the waters of the State of California. Title 23 includes requirements intended to protect waters of the state from discharges of hazardous substances. General closure requirements and criteria are provided in Title 23, Chapter 16.
- Hazardous Waste Control Act (HWCA; California Health and Safety Code, Section 25100 et seq.) – The HWCA is the state equivalent of RCRA and regulates the generation, treatment, storage, and disposal of hazardous waste. This Act implements the RCRA "cradle-to-grave" waste management system in California but is more stringent in its regulation of non-RCRA wastes, spent lubricating oil, small-quantity generators, and transportation and permitting requirements, as well as in its penalties for violations. HWCA applies to this program because contractors will be required to comply with its hazardous waste requirements that would reduce the possibility of spills.
- Hazardous Waste Substance Account Act (HSAA; California Health and Safety Code, Section 25300 et seq.) – The HSAA is the state equivalent of the Superfund program that authorizes CalEPA to clean up contaminated sites and hazardous substances releases. HSAA authorizes the state to cleanup sites which do not quality for cleanup under the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). HSAA also provides funds to the state to pay its share of cleanup costs.
- California Hazardous Materials Release Response Plans and Inventory Law of 1985 (Business Plan Act) – The Business Plan Act requires preparation of hazardous materials business plans and disclosure of hazardous materials inventories, including an inventory of hazardous materials handled, plans showing where hazardous materials are stored, an emergency response plan, and provisions for employee training in safety and emergency response procedures (California Health and Safety Code, Division 20, Chapter 6.95, Article

1). Statewide, DTSC has primary regulatory responsibility for management of hazardous wastes, with delegation of authority to local jurisdictions that enter into agreements with the state. Local agencies are responsible for administering these regulations.

Several state agencies regulate the transportation and use of hazardous materials to minimize potential risks to public health and safety, including California Environmental Protection Agency (CalEPA) and the California Emergency Management Agency. The California Highway Patrol and Caltrans enforce regulations specifically related to the transport of hazardous materials. Together, these agencies determine container types used and license hazardous waste haulers for hazardous waste transportation on public roadways.

The Business Plan Act applies to this program because contractors will be required to comply with its handling, storage, and transportation requirements that would reduce the possibility of spills, and to prepare an emergency response plan to respond to accidental spills.

- California Executive Order No. D-62-02 (aka Governor's Moratorium) – This order requires material from decommissioned facilities that previously handled radioactive materials to be disposed of in a RCRA Class I hazardous waste disposal facility, even when the materials of the decommissioned facility have been decontaminated and are not known to exhibit radioactive properties.
- California Division of Occupational Safety and Health (Cal/OSHA) – Cal/OSHA is responsible for developing and enforcing workplace safety standards and assuring worker safety in the handling and use of hazardous materials. Among other requirements, Cal/OSHA requires many entities to prepare injury and illness prevention plans and chemical hygiene plans, and provides specific regulations to limit exposure of construction workers to lead. OSHA applies to this program because contractors will be required to comply with its handling and use requirements that would reduce the possibility of spills, and to prepare an emergency response plan to respond to accidental spills.
- California Vehicle Code Section 38366 – The California Vehicle Code, Section 38366, requires spark-arresting equipment on vehicles that travel off-road. This code applies to the program because the vehicles that work in off-road areas will be required to have spark-arresting equipment to reduce the risk of wildfires.
- Office of Environmental Health Hazard Assessment Risk Assessment Guidance – The health risk calculation methodology is based on the OEHHA Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA Guidance) (OEHHA, 2015). OEHHA does not promulgate environmental regulations directly; however, it is responsible for developing and providing toxicological and medical information relevant to decisions involving public health to agencies, such as Cal/EPA.

On-Road Heavy-Duty Diesel Vehicles (In Use) Regulation

On December 12, 2008, CARB approved the on-road heavy-duty diesel vehicle (in use) regulation to significantly reduce particulate matter and NO_X emissions from existing diesel vehicles operating in California. The regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. The regulation applies to nearly all diesel-fueled trucks and buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds that are privately or federally owned and for privately and publicly owned school buses. Other public fleets, solid-waste collection trucks, and transit buses are already subject to other regulations and are not part of the truck and bus regulation.

On January 1, 2012, the regulation implemented phase-in requirements for heavier trucks to reduce particulate matter emissions with exhaust retrofit filters that capture pollutants before they are emitted to the air or by replacing vehicles with newer vehicles that are originally equipped with PM filters. Starting on January 1, 2015, lighter trucks with a GVWR of 14,001 to 26,000 pounds with engines that are 20 years or older would need to be replaced with newer trucks. Starting January 1, 2020, all remaining trucks and buses would need to be replaced so that they would all have 2010 model year engines or equivalent emissions by 2023.

Off-Road Diesel Fleet Regulation

On July 26, 2007, CARB adopted this regulation to reduce diesel particulate matter and NO_X emissions from existing off-road heavy-duty diesel vehicles in California that are used in construction, mining, and industrial operations. The Off-Road Diesel Fleet Regulation does the following:

- Imposes limits on idling, requires a written idling policy, and requires a disclosure when selling vehicles.
- Requires all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System) and labeled.
- Restricts the adding of older vehicles into fleets.
- Requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (i.e., exhaust retrofits).

The Off-Road Diesel Fleet Regulation applies to all self-propelled off-road diesel vehicles over 25 horsepower (hp) used in California and most two-engine vehicles (except on-road two-engine sweepers). The regulation does not apply to stationary equipment or portable equipment, such as generators. Vehicles that are exempt from this regulation include personal-use vehicles, vehicles used solely for agriculture, vehicles that are awaiting sale, emergency operations vehicles, dedicated snow-removal vehicles, low-use vehicles (used under 200 hours per year), and vehicles that are already covered by the Regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards (Cargo Handling regulation). The off-road performance requirements are applied to a fleet as a whole and not to individual vehicles, and are based on a fleet's average NO_X emissions. The goal of the regulation is to encourage fleet owners to replace a certain percentage of their diesel fleet over time with cleaner-emitting vehicles in order to meet the lower annual NO_X limits.

The regulation was amended in December 2010 to provide a 4-year delay from the original compliance timeline for all fleets. By January of each year, starting in 2014, each fleet must meet the fleet average NO_X requirements or, as an alternative, a specified percentage of the fleet must be replaced with newer engines.

DTSC

DTSC oversees and enforces the cleanup of soils and groundwater, and evaluates soil, water, and air samples taken at waste or contaminated sites. DTSC is the state agency responsible for administering and enforcing the Hazardous Substance Account Act (Health & Safety Code,

Sections 25300, et seq.). Pursuant to Health and Safety Code Section 25355.5, DTSC may enter into agreements to provide remediation oversight services with responsible parties for cleanup of contaminated sites, such as the proposed project. Additionally, DTSC is the state agency responsible for administering and enforcing the Hazardous Waste Control Law (Health & Safety Code Sections 25200, et seq.) and its implementing regulations (CCR Title 22, Sections 66260.1 et seq.) regulating the handling, storage, transportation, disposal, treatment, reduction, clean-up, and emergency planning of hazardous waste.

Caltrans

Caltrans sets standards for trucks in California which are enforced by the California Highway Patrol. Trucks transporting hazardous waste are required to maintain a hazardous waste manifest. This manifest is required to describe the contents of the material in the truck so that wastes can be readily identified in the event of a spill. State regulations require the use of certified hazardous waste haulers for the transport of hazardous waste in California. Certified waste haulers are required to adhere to certain inspection and maintenance schedules and maintain sufficient insurance coverage. These regulations would apply to trucks that transport hazardous materials from the site under the project.

4.7.2.3 Regional

Ventura County Air Pollution Control District

The VCAPCD is the regional agency responsible for air quality regulation within the local air basin. The VCAPCD regulates air quality through its planning and review activities. The VCAPCD has permit authority over most types of stationary emission sources, including stationary sources of TAC emissions, and requires stationary sources to obtain permits, impose emission limits, set fuel or material specifications, and establish operational limits to reduce air emissions.

State law assigns local air districts the primary responsibility for control of air pollution from stationary sources, under the California Air Resources Board's oversight. The VCAPCD is responsible for developing regulations governing emissions of air pollution, permitting and inspecting stationary sources of air pollution, monitoring of ambient air quality, and air quality planning activities, including implementation of transportation control measures.

The following two regulations would apply to the project.

Rule 55 - Fugitive Dust: This rule regulates fugitive dust sources and provides regulations to monitor for, minimize, and control fugitive dust. The rule identifies the specific activities covered, test methods, standards to be achieved, and record keeping requirements.

Rule 74.29 – Soil Decontamination Requirements: This rule regulates the aeration of soils with gasoline, diesel fuel, or jet fuel, if such aeration emits reactive organic compounds. The VCAPCD Rule 2 defines reactive organic compounds as any compound containing at least one atom of carbon except exempt organic compounds identified in Rule 2, and includes organic compounds, organic gases, organic liquids, organic materials, organic vapors, volatile organic compounds, and hydrocarbons. This rule provides regulations to monitor for,

minimize, and control emissions. The rule identifies the specific activities covered, test methods, standards to be achieved, and record keeping requirements.

VCAPCD Regulation II (Permits) establishes permitting requirements for stationary sources of emissions, including stationary sources of TACs. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. The VCAPCD, under Rule 17, limits emissions and public exposure to TACs via compliance with the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, 1987, Connelly), which was enacted in 1987, and requires stationary sources to report the types and quantities of certain substances routinely released into the air. The goals of AB 2588 are to collect emission data, to identify facilities having localized impacts, to ascertain health risks, to notify nearby residents of significant risks, and to reduce those significant risks to acceptable levels. In accordance with AB 2588, the VCAPCD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors. Similar to the VCAPCD, the SCAQMD establishes requirements for stationary sources. Under SCAQMD Regulation XIV (Toxics and Other Non-Criteria Pollutants), all stationary sources that possess the potential to emit TACs are required to obtain permits from SCAQMD. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures.

The SCAQMD, under Rule 1402, limits emissions and public exposure to TACs via compliance with AB 2588 and prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors. The SCAQMD has also developed the *Air Toxics Control Plan* (March 2000, revised March 26, 2004), which is a planning document designed to examine the overall direction of SCAQMD's air toxics control program. The *Air Toxics Control Plan* includes development and implementation of strategic initiatives to monitor and control air toxics emissions. Control strategies that are deemed viable and are within SCAQMD's jurisdiction will each be brought to the SCAQMD Board for further consideration through the normal public review process. Strategies that are to be implemented by other agencies will be developed in a cooperative effort, and the progress will be reported back to the Board periodically.

4.7.2.4 Local

Applicable regulations have been included for Ventura County (the project site is located within Ventura County).

Certified Unified Program Agency

In 1993, Senate Bill (SB) 1082 was passed by the State Legislature to streamline the permitting process for those businesses that use, store, or manufacture hazardous materials. The passage of SB 1082 provided for the designation of a CUPA that would be responsible for the permitting process and collection of fees. The CUPA would be responsible for implementing a Unified Program at the local level, which serves to consolidate, coordinate, and make consistent the

administrative requirements, permits, inspections, and enforcement activities for the following environmental and emergency management programs:

- Some Hazardous Waste
- Hazardous Materials Business Plan
- California Accidental Release Prevention Program
- Underground Hazardous Materials Storage Tanks
- Aboveground Petroleum Storage Tanks/Spill Prevention Control & Countermeasure Plans
- Hazardous Waste Generator and Onsite Hazardous Waste Treatment (tiered permitting) Programs

The CUPA in Ventura County is the County of Ventura Environmental Health Division. As such, the Division is given the primary regulatory responsibility for implementing and managing the above-listed programs. The CUPA would have the oversight authority for some tiered onsite treatment systems and for the transport of hazardous materials to offsite disposal facilities.

Ventura County General Plan

The Ventura County General Plan contains many policies designed to minimize the effects of geologic hazards and erosion. Relevant policies are excerpted below.

Hazards and Hazardous Materials Policies

Hazards

2.1.2.4 Develop, maintain and enhance mutual training and aid agreements with other public agencies, and cooperatively plan to prevent and respond to regional emergencies.

Fire Hazards

2.13.1 All applicants for discretionary permits shall be required, as a condition of approval, to provide adequate water supply and access for fire protection and evacuation purposes.

2.13.2 All discretionary permits in fire hazard areas shall be conditioned to include fire-resistant vegetation, cleared firebreaks, or a long-term comprehensive fuel management program as a condition of approval. Fire hazard reduction measures shall be incorporated into the design of any project in a fire hazard area.

Hazardous Materials

2.15.1. Hazardous wastes and hazardous materials shall be managed in such a way that waste reduction through alternative technology is the first priority, followed by recycling and onsite treatment, with disposal as the last resort.

2.15.2 Site plans for discretionary development that will generate hazardous wastes or utilize hazardous materials shall include details on hazardous waste reduction, recycling and storage.

2.15.3 Any business that handles a hazardous material shall establish a plan for emergency response to a release or threatened release of a hazardous material. The County Fire Protection District is designated as the agency responsible for implementation of this policy.

2.15.4 Applicants shall provide a statement indicating the presence of any hazardous wastes on a site, prior to development. The applicant must demonstrate that the waste site is properly closed, or will be closed before the project is inaugurated.

2.15.5 Commercial or industrial uses which generate, store, or handle hazardous waste and/or hazardous materials shall be located in compliance with the County Hazardous Waste Management Plan's siting criteria.

Los Angeles County General Plan

Although the site is in Ventura County, demolition, excavation, and remediation activities would result in the transportation of hazardous materials through Los Angeles County, potentially resulting in the emission of TACs and other hazardous compounds that may expose sensitive populations in Los Angeles County. The following policies in the County of Los Angeles General Plan pertain to Cleanup Activities within the remediation activities:

Policy S 4.1: Ensure that residents are protected from the public health consequences of natural or man-made disasters through increased readiness and response capabilities, risk communication, and the dissemination of public information.

Policy S 4.3: Coordinate with other County and public agencies, such as transportation agencies, and health care providers on emergency planning and response activities, and evacuation planning.

City of Los Angeles General Plan

Although the site is in Ventura County, demolition, excavation, and remediation activities would result in the transportation of hazardous materials through the city of Los Angeles, potentially resulting in the emission of TACs and other hazardous compounds that may expose sensitive populations in the city of Los Angeles. The following goals in the 1996 City of Los Angeles General Plan Safety Element pertain to Cleanup Activities within the remediation activities:

Goal 1.1.4: Health and environmental protection. Protection of the environment and public from potential health and safety hazards associated with program implementation. Protect the public and workers from the release of hazardous materials. And protect City water supplies and resources from contamination resulting from accidental release or intrusion from a disaster event.

Goal 2.1.2: Health and environmental protection. Develop and implement procedures to protect the environment and public, including animal control and care, to the greatest extent feasible within the resources available, from potential health and safety hazards associated with hazard mitigation and disaster recovery efforts.

4.7.3 Thresholds of Significance

For the purposes of this PEIR, DTSC has based the thresholds of significance on the checklist questions regarding hazards and hazardous materials in Appendix G of the CEQA Guidelines. In addition, Ventura County's Initial Study Assessment Guidelines have been incorporated, where appropriate, into the analysis. Please see Chapter 7.0, *Impacts Found Not to Be Significant*, of this PEIR, for a discussion of hazards and hazardous materials issues where the characteristics of the

project made it clear that effects would not be significant and further evaluation in this section was not warranted.

Based on the size and scope of the project and the potential for impacts associated with hazards and hazardous materials, the criteria identified below are included for evaluation in this PEIR.

Would the project:

4.7-1 Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (refer to Impact Statements 4.7-1a and 4.7-1b)?

4.7-2 Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment (refer to Impact Statements 4.7-2a and 4.7-2b)?

4.7-3 Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school (refer to Impact Statements 4.7-3a and 4.7-3b)?

4.7-4 Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan (refer to Impact Statements 4.7-4a and 4.7-4b)?

4.7-5 Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands (refer to Impact Statements 4.7-5a and 4.7-5b)?

4.7-6 Create a significant hazard to the public or the environment through the use of chemical amendments for the treatment of chemicals in soil and/or groundwater (refer to Impact Statements 4.7-6a and 4.7-6b)?

4.7-7 Would the overall site cleanup or initial activities project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment (refer to Impact Statements 4.7-7a and 4.7-7b)?

Cancer Risk

Cancer risks have no set thresholds because carcinogens are considered non-threshold pollutants. This means that for any non-zero concentration of a carcinogen, there is an increased risk of developing cancer. Therefore, significance of exposure to a carcinogen is evaluated based on the increase in risk. A health risk assessment evaluates the increased cancer risk from the continuous exposure to a pollutant over a lifetime.

The SCAQMD has established thresholds of significance for health risks due to exposure to TAC emissions resulting directly from a project. Based on SCAQMD guidance, a significant impact would occur if implementation of the cleanup would result in greater than a 10 in one million (1.0×10^{-5}) incremental increase in lifetime cancer risk at the maximally exposed individual (MEI).

The thresholds for acute and chronic non-carcinogenic impacts are based on TAC concentrations in excess of the reference exposure level (REL). The REL is the concentration at or below which no adverse health effects are anticipated. The Hazard Index (HI) is the ratio of the TAC concentration and the REL. Thus, a significant impact would occur if implementation of the Cleanup Plan would result in a chronic or acute HI greater than or equal to 1.0.

Radiological Exposure

The maximum radiological exposure[2] to workers and the general population is limited by federal regulation. Pursuant to the federal Atomic Energy Act, DOE regulates radioactive waste and the radioactive portion of mixed waste pursuant to the Atomic Energy Act and DOE Order 435.1, Radioactive Waste Management. For transport workers, the applicable USDOT regulatory limit is 2 millirem (mrem) per hour (49 CFR 173.441(b)(4)).[3] Lesser annual exposure limits are set for employees who are pregnant women (500 mrem to the embryo/fetus from the period of conception to birth), and for minors who are occupationally exposed to radiation and/or radioactive materials (100 mrem per year) (10 CFR 835.206, 207).

For DOE activities, the exposure of the public to radiation sources as a consequence of all routine DOE activities shall not cause, in a year, an effective dose equivalent greater than 100 mrem (DOE Order 5400.5). This standard includes exposure to both airborne radionuclides and penetrating radiation. For the purposes of this analysis, the exposure limit for the general population is 100 mrem per year. USEPA has also established a limit of 10 mrem per year for airborne emissions for the general public (40 CFR 61).

DOE has its own requirements for exposure to radiation, as specified in its EIS:

> *In addition to complying with USDOT requirements, a DOE employee would also need to comply with 10 CFR Part 835, which limits worker radiation doses to 5 rem per year; however, DOE's goal is to maintain radiological exposure as low as reasonably achievable. DOE has therefore established an Administrative Control Level of 2 rem per year. A commercial truck driver who has been trained as a radiation worker is subject to Occupational Safety and Health Administration regulations, which limit the whole body dose to 5 rem per year (29 CFR 1910.1096(b)), and the USDOT requirement of 2 millirem per hour in the truck cab (49 CFR 173.411). Commercial truck drivers who have been trained as radiation workers would have the same administrative dose limit as DOE employees; therefore, for purposes of analysis, a maximally exposed driver would not be expected to exceed the DOE Administrative Control Level of 2 rem per year. For a truck driver who is not trained as a radiation worker, the maximum annual dose is limited to 100 millirem (10 CFR 20.1301)* (DOE, 2017).

[2] The fundamental unit of radiation exposure or dose is the rem (Radiation equivalent man), which measures the effect of exposure to radiation; a millirem, or mrem, is simply 1/1,000 of a rem. All three notations are used here.

[3] Such exclusive-use shipments must meet a regulatory limit of 10 millirem per hour at 6.6 feet from the outer lateral surface of the transport vehicle (10 CFR 71.47 and 49 CFR 173.441).

The analysis of impacts from an accidental upset or release of hazardous materials is evaluated based on the likelihood of an accidental release occurrence and the severity of the consequence. The impact threshold is based on a quantitative relationship between the probability of an accidental release and the severity of an impact using a risk assessment matrix in the Center for Chemical Process Safety Guidelines for Hazard Evaluation Procedures (CCPS, 2008).

4.7.4 Methodology

This impact section assesses potential impacts related to hazards and hazardous materials based on the potential for the project to expose structures, people, or the environment to hazards and hazardous materials during project implementation, using existing site conditions as a baseline for comparison. The potential for the project to cause adverse impacts to human health is analyzed in a health risk assessment. The potential for damage to proposed structures or increased risk of injury due to hazards and hazardous materials is analyzed using available data from site-specific investigations and existing publications and maps completed by state and federal agencies such as DTSC, LARWQCB, and CALFIRE. In addition, the severity and significance of hazards and hazardous materials impacts are analyzed in the context of existing hazards and hazardous materials regulations and policies.

4.7.4.1 Health Risk Assessment

The four basic processes to complete in performing an HRA are as follows and explained in detail below:

- Hazard Identification – A risk assessment must first seek to identify if the process involves possible exposure to a substance that is known or suspected to cause an undesirable outcome. Examples of environmental hazards include acute or chronic non-cancer adverse health effects, (e.g. infertility and birth defects) and cancer.
- Dose-Response – In order to evaluate the potential adverse effects associated with exposure to chemicals, the relationship between the dose of each chemical and the probability of an adverse health effect in an exposed population must be determined. This is known as the dose-response assessment and is based on data collected from animal studies and theoretical precepts about what might occur in humans. A human HRA can consider both the carcinogenic and non-carcinogenic health effects associated with chemicals based on dose-response criteria published by various regulatory and health agencies.
- Exposure Assessment – In this step, the risk assessment strives to calculate the extent of the possible exposure. Exposure assessments consider both the spatial and temporal nature of possible release and exposure scenarios. A refined risk assessment may consider release parameters such as the amount of the toxic substance spilled or released (pounds, gallons) and its physical characteristics (pressure, temperature, phase), the duration of the release (seconds, hours, continuous), the frequency of the release (one discreet event, once per day, continuously), the means of release to the atmosphere, and the methods and efficacy of control measures to minimize the release. In addition, the HRA must consider the distance between the receptor and source, frequency and duration of the exposure, attenuation of the released substance, physical characteristics of the exposed population, etc. Exposure concentrations can be estimated using screening techniques or predicted using refined dispersion modeling (for inhalation pathways) analyses which take into account wind speed

and direction, temperature, atmospheric pressure, and the influence of intervening buildings and topography. Other modeling techniques, are available to predict exposure by other means, such as transport through water, volatilization from soil, ingestion via drinking water, root uptake in crops, and bioaccumulation in fish and livestock. This step is also commonly referred to as "fate and transport."

- Risk Characterization – Risk characterization is the final step in the risk quantification process, combining the toxicity assessment and estimated exposure to the chemical fate and transport concentrations. The risk values contained in HRAs typically reflect an estimated upper limit of the increased risk of the negative health outcome occurring under the exposure scenarios evaluated. The OEHHA Guidance recommends that cleanup activity duration be used for determining incremental residential cancer risks (exposure for 7 days per week, 50 weeks per year). This ensures that a person residing in the vicinity of a facility would be included in the evaluation of risk posed by that facility. Exposure also takes into account the very young through use of age sensitivity factors (ASF). Age sensitivity factors take into account sensitivity of children starting from the third trimester of pregnancy through 16 years of age.

  OEHHA has developed age sensitivity factors starting in the third trimester. Due to the variability in data for different carcinogens and the limited database available for analysis, OEHHA is not proposing the application of a specific factor to cancer potency estimates for prenatal exposures in the first and second trimesters as a default position. Consideration of prenatal exposures would not make a large difference due to relatively short duration of exposure compared to a lifetime exposure.[4]

Chemicals of Concern (COCs)

As discussed previously, a series of RCRA Facility Investigations (RFI's) have been performed for groups located throughout the SSFL site. As part of each RFI, soil, soil vapor, and groundwater sampling data were compiled, reviewed, and evaluated consistent with the methodology presented in the Standardized Risk Assessment Methodology (SRAM). The SRAM incorporates methodology from OEHHA, USEPA and other regulatory agencies to identify a common protocol used to assess health risk throughout the site. Data requirements and selection criteria from the SRAM were implemented as part of the data evaluation process. This process reviews sampling data such as sample locations, detection limit uncertainty and screens data to determine if the data would be representative of the site. This methodology also determines whether a specific pollutant should be carried forward in the data evaluation process. Chemical data carried forward in the analysis is then compared to background (naturally occurring or anthropogenic) conditions. This would also include chemicals that were not historically used at the SSFL site. Detected chemicals were also compared to ecological screening levels (ESL) to determine if the chemical would pose an ecological risk.

Those chemicals that have a potential to cause adverse human health impacts are defined as chemicals of concern (COCs). Table 4.7-1 lists the COCs detected in soil samples that are or have historically been associated with the site. The overall COC selection process includes the

[4] Technical Support Document for Cancer Potency Factors. Office of Environmental Health and Hazard Assessment. May 2009.

following steps, however the RFI prepared for each individual group may have some deviations and modifications to the selection process.

1. Chemical is detected at the site, compared to laboratory field blanks and is validated.
2. Chemical was historically used at the site
3. Metals, dioxins, PAHs, pesticides/herbicides, and furans are above background conditions
4. Chemicals which are detected in excess of the ESL

In addition to COC's contained in environmental media, cleanup activities would require the use of diesel powered equipment and trucks that would result in diesel particulate matter emissions. The State has designated DPM as a TAC and regulates it as a carcinogen (CARB, 2012); therefore, DPM resulting from diesel-driven equipment and localized diesel vehicle emissions was included in the list of COCs.

Chemical Concentrations

Detected levels of specific chemicals in soil, soil gas and groundwater samples vary throughout the site because of varying historic uses. Due to this variability, statistical analyses were performed to develop appropriate average concentrations for each Chemical of Potential Concern COPC to be used for the risk analysis, consistent with DTSC and USEPA guidance for human health risk assessments (USEPA, 1992). Each RFI identified the maximum detected concentration, the reasonable maximum exposure (RME), and the central tendency exposure (CTE). The maximum represents a worst case exposure. The CTE concentration is the arithmetic mean as specified by the SRAM and represents the average exposure. The RME concentration (generally the 95 percent UCL) was calculated using the ProUCL software program developed by USEPA.

As recommended by the USEPA, the 95 percent Upper Confidence Limits (UCLs) of the arithmetic means were generally selected for the concentrations (USEPA, 2010). The 95 percent UCL is defined as "a value that, when repeatedly calculated for randomly drawn (data) subsets of size n, equals or exceeds the true population mean 95 percent of the time" (USEPA, 2001). Thus, the 95 percent UCL represents an upper bound on the mean concentration for each COPC, and is frequently used as the exposure point concentration (EPC) for COPCs. For chemicals with a low frequency of detection, reliable 95 percent UCLs could not be calculated. Thus, for chemicals detected in low frequencies, the maximum concentration was used as a representative concentration, which is a highly conservative approach and could exaggerate the risk presented by those chemicals.

The EPC used for the analysis is based on the maximum, RME, or CTE concentration. The RME represents the best statistical estimate of an upper bound of average exposure concentrations and would therefore be representative of the site.

Toxic Air Contaminants

To assess the risk of potential negative health outcomes (cancer, or other acute or chronic conditions) related to TAC exposure from airborne emissions during implementation of the cleanup, a refined quantitative health risk analysis was prepared. The HRA evaluated the potential for increased health risks for offsite receptors due to onsite cleanup activities and offsite truck activities.

Activities associated with cleanup of the site would result in emissions of fugitive dust, equipment exhaust, and volatile organic compounds (VOCs). Although fugitive dust itself is not considered toxic, metals and other chemicals bound to the soil particulates could expose sensitive receptors to health hazards. The methodology used to calculate emissions of hazardous chemicals was to first identify all of the emission characterization techniques, equations, and models that were used for the Conceptual Exposure Model (CEM) release mechanisms. The second step was to assign the applicable techniques, equations, and models for estimating emissions to the cleanup activities. The process involved defining activities both spatially across the site and also temporally during cleanup activities and cross-referencing the physical remediation activities to the release mechanisms and emissions equations.

The sources considered in the HRA include the following:

- **Equipment and Truck Exhaust:** Equipment and trucks operating onsite would emit DPM during operation and idling.
- **Excavation and Grading Activities:** Soil would be graded and excavated from different portions of the site and transported offsite for disposal. Fugitive dust and volatile compounds may be emitted when soil is handled (picked up/dropped); however, implementation of mitigation measures would reduce potential emissions.
- **Reentrained Road Dust:** Heavy equipment and trucks travelling on unpaved roads onsite would emit fugitive dust from tires/tracks. Most onsite roads would be watered or controlled with soil binders which minimize fugitive dust emissions and additional dust control measures may be implemented.
- **Wind Erosion:** Excavated soil may be stockpiled onsite prior to reconsolidation or transport offsite. Although stockpiles would be covered with tarps or covered with dust suppressants and other dust control measures may be implemented, small amounts of wind-blown dust could result in fugitive dust emissions.

Emissions from these sources were calculated for each year of the cleanup activities. In addition to emissions being calculated on a temporal (time) basis, where a source of potential emissions could be identified, emissions were also calculated specifically for such sources to allow for more representative dispersion modeling. Additional details regarding pollutant emissions are provided below and in Appendix F to this PEIR. Fugitive dust emissions were calculated based on USEPA AP-42 emission factors. Fugitive dust emissions were calculated equipment travel (scraper, grader, dozer, excavator), truck loading, demolition activities / concrete breaking, and reentrained road dust. Equations and assumptions used to generate the AP-42 emission factors are provided in detail in Appendix D of this PEIR.

Diesel Particulate Matter

In addition to COCs contained in soil at the site, DPM from equipment exhaust is the TAC of primary concern. Project activities would result in emissions of PM in exhaust from off-road (i.e., onsite) diesel-powered equipment and on-road trucks. As described above, sensitive receptors near these sources of particulate matter (PM) exhaust include residential, educational, and employment land uses located around the site and along the various transportation routes. Because DPM is the majority subset component of PM_{10}, PM_{10} exhaust emissions from the appropriate emissions model (see Appendix D of this PEIR) were conservatively used in the HRA. Detailed DPM emissions calculations including equipment type, hours and horsepower rating are provided in Appendix D of this PEIR. DPM emissions were calculated based on the CARB Emission Factor (EMFAC) model.

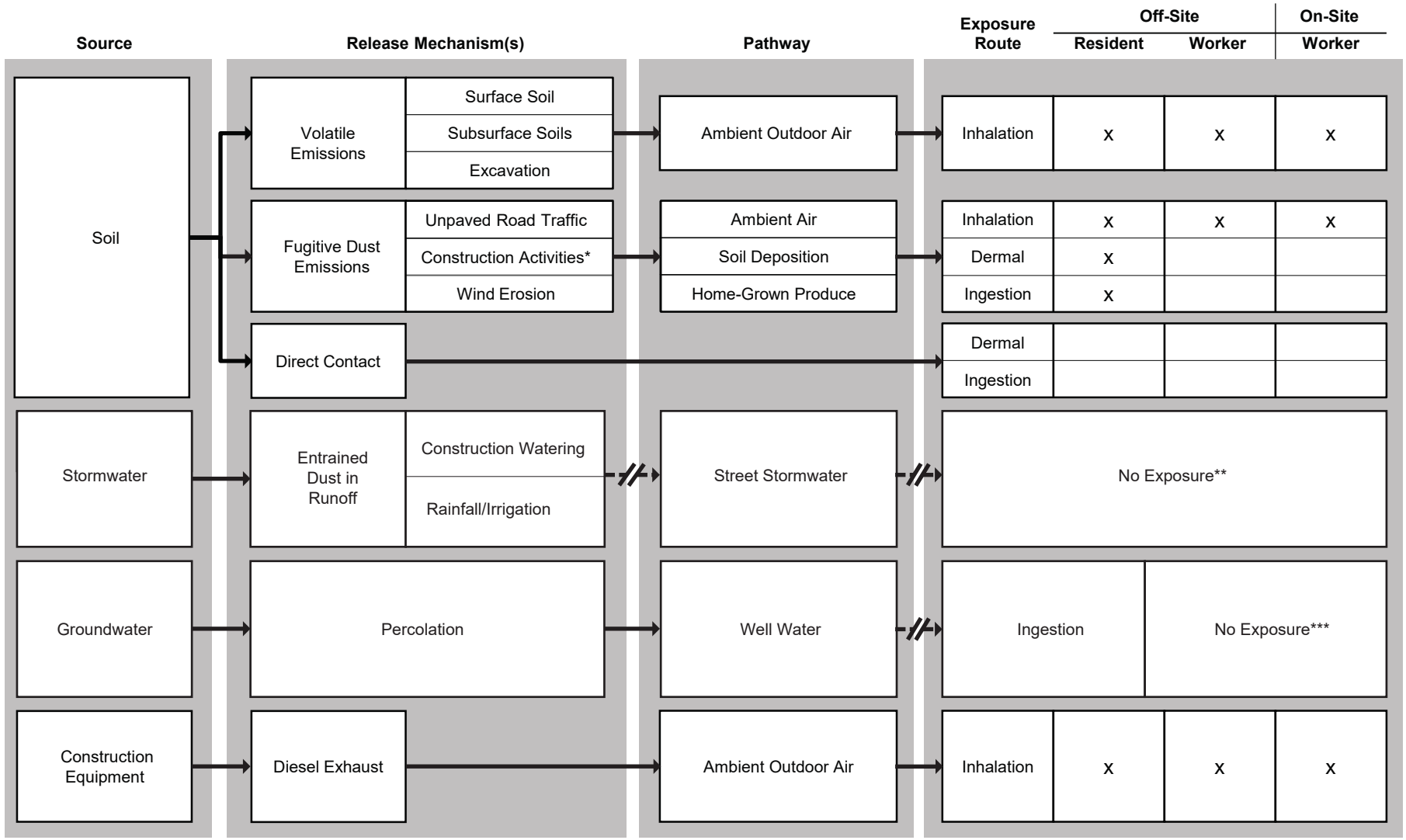
DPM Concentrations were used to calculate potential health risks assuming a greatest degree of potential impact scenario of a fetus/child being in the third trimester of development at the beginning of remediation activities and remaining at that location throughout the project duration. For residential or sensitive receptors, OEHHA recommends that exposure starts in the third trimester to account for increased sensitivity for younger ages (OEHHA, 2015). The analysis assumed that 96 trucks per day would access the site over a 3-year period and 80 trucks per day would access the site for the remaining 12 years of the cleanup process.[5]

Conceptual Exposure Model

The CEM provides the basis for a comprehensive evaluation of the risks to human health by identifying the mechanisms through which receptors may be exposed to COCs. The CEM traces the COCs from their sources through release mechanisms and exposure routes to the potentially affected receptors. Pathways of human exposure are termed “complete” exposure pathways when a source is traced to a sensitive receptor (resident, student, worker). An exposure pathway consists of three related components: (1) a source of COCs (often with a release mechanism specified); (2) a receptor; and (3) a route of exposure of the receptor to released COCs. **Figure 4.7-1** shows the CEM developed for the project, which contains sources of COCs associated with cleanup of the site such as fugitive dust, equipment and truck exhaust, ground and stormwater discharge, and volatilization of compounds.

Chemicals potentially released from the project site during cleanup activities could potentially contact and affect humans through distinct “routes of exposure,” including inhalation, direct skin (dermal) contact and ingestion (oral exposure). During short-term activities associated with cleanup activities, the inhalation represents the main exposure pathway of concern for volatile chemical vapors, while non-volatile chemicals bound to dust particles or diesel particulates can enter the body through inhalation, inadvertent ingestion and dermal exposure pathways.

[5] An average of 80 trucks per day was used for overall site cleanup, because the level of activity is not anticipated to sustain 96 trucks per day over an entire year. The 80 trucks per day is an average daily activity level assumed over a peak year of activity.



* Other construction activities include dumping of excavated soil, dozing, grading, and tilling.
** No exposure due to incomplete pathway (Aquifer under site is not used for drinking water supply)

D120894.00

SOURCE: ESA, 2017

Santa Susana Field Laboratory Project

Figure 4.7-1

Conceptual Exposure Model

ESA

Dispersion Modeling

Dispersion modeling for health risk impacts was performed using the AERMOD (version 16216r) dispersion model and assuming sources are located throughout the specific RPs areas and along the anticipated truck routes. AERMOD is used to model concentrations of pollutants for each receptor. For each receptor location, AERMOD generates air concentrations that result from emissions from multiple sources. Modeled sensitive receptors were placed along the offsite haul routes and in the residential communities nearest to the project site. The AERMOD model requires numerous inputs, such as meteorological data, source parameters, topographical data, and receptor characteristics. As detailed in the following sections, the concentrations derived from the AERMOD model are converted to cancer risk using the HARP model. Specific AERMOD inputs and modeling outputs are included in Appendix F of this PEIR.

Health Risk Calculations

Health risk impacts were assessed using methodology provided in the 2015 OEHHA *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. For this risk assessment, the AERMOD dispersion model output was converted into specific cancer risks and non-cancer chronic health hazard impacts for each COC. The results of this remediation-phase HRA were calculated based on identifying the MEI. The location of the MEI for calculation of chronic non-cancer health hazards and cancer risks may vary depending on the haul route and the mitigation scenario.

Health impacts are evaluated using a dose-response assessment, which describes the relationship between the amount of exposure to a substance (i.e., the dose) and the incidence or occurrence of injury (i.e., the response; OEHHA, 2015). In order to determine the total dose to offsite sensitive receptors, the applicable pathways of exposure and receptor locations were identified. The applicable exposure pathways determine the exposure algorithms that are used to estimate dose. After the exposure pathways were identified, the applicable fate and transport algorithms were used to estimate concentrations in the applicable exposure media (e.g., air) and the exposure algorithms were used to determine the substance-specific dose.

In accordance with the OEHHA Guidance, the inhalation pathway was evaluated for each COC. Also using the methodology outlined in the OEHHA Guidance, the cancer risk and non-cancer chronic risk from soil ingestion, dermal adsorption, mother's milk and home grown produce pathways were incorporated into the risk analysis. The intake rate percentiles from the OEHHA Derived Method was used for this multi-pathway risk assessment, which uses high-end exposure parameters for the two exposure pathways with the highest risk and average point estimates for the other pathways (OEHHA, 2015). A deposition rate of 0.02 m/s (controlled sources) were used for non-inhalation pathways, and warm climate was used for estimating risks associated with the dermal pathway.

Once dose is calculated, the risk of adverse health consequences is estimated for both cancer and non-cancer health effects. Cancer risk is calculated by accounting for cancer potency of the specific pollutant, age sensitivity, exposure duration, averaging time for lifetime cancer risk, and fraction of time spent at home (sensitive receptor). The Cancer Potency Factor (CPF) is specific

for each pollutant and is determined through peer reviewed scientific studies. OEHHA has determined that DPM has an inhalation unit risk factor (URF) of 3.0E-4 $(ug/m^3)^{-1}$ and an oral slope factor of 1.1 $(mg/kg\text{-}day)^{-1}$ (OEHHA, 2009). The URF and slope factor for other COCs are contained in Appendix F of this PEIR. The ASF accounts for greater susceptibility in early life, starting from the third trimester of pregnancy to 70 years. The fraction of time at home (FAH) takes into account the time actually residing at the sensitive receptor location and is specific for various age groups. For example, newborns are expected to reside at home for longer periods of time compared to school age children, and the elderly (retirees) are expected to spend more time at home compared to people of working age. Each age group has different exposure parameters, which require cancer risk to be calculated separately for each age group. As a conservative approach, this analysis did not take into account FAH adjustments for the entire project duration of 15 years and used a value of 1.0.

Non-cancer risks to health are calculated using RELs developed by OEHHA to evaluate acute and chronic exposure including the elderly and the very young. Again as a conservative assumption, acute and chronic non-cancer health impact analyses do not take into account FAH adjustments.

Cancer risks were calculated for the residential child and adult receptors by multiplying the exposure doses by the pollutant-specific CPF values.

4.7.4.2 Radiological Impacts

The following section describes the methods used to determine health risks associated with potential exposure to radioisotopes during site cleanup. Three categories of risk were estimated: (1) exposure to site workers and nearby residents during onsite cleanup activities; (2) exposure to the transport crew during transportations; and (3): exposure to nearby residents during transportation. To assess health risks associated with exposure to radiation from all onsite sources, the quantitative risk methodology used by DOE in their Draft EIS for Remediation of Area IV and the Northern Buffer Zone of the SSFL (DOE, 2017) was applied to the project-specific truck trips for transporting low-level radioactive waste (LLRW) and mixed low-level radioactive waste (MLLRW). This methodology was developed by a number of agencies and organizations, including the Nuclear Regulatory Commission, the DOE, and Sandia National Laboratories, and utilizes multiple models and databases including the Transportation Routing Analysis Geographic Information System, the Radioactive Material Transportation Risk Assessment computer model, and the Risks and Consequences of Radioactive Material Transport computer model (for more detail, please refer to the DOE Draft EIS). Although NASA also assessed risks associated with the removal of radioactive waste, the DOE methodology was determined to be more comprehensive and quantitative; therefore, the DOE risk study is the primary source used in this analysis.

To assess health risks associated with potential isotope exposures during the transportation of radioactive waste on public highways, health risks were evaluated using incident-free (normal) transportation conditions and unanticipated transportation accidents. The radiological risk associated with incident-free transportation conditions would result from potential external exposures to residents who live in the vicinity of a waste shipment, as well as to truck drivers.

The radiological risk associated with transportation accidents would result from the potential release and dispersal of radioactive material into the environment and the subsequent exposure of nearby residents and truck drivers.

Radiological impacts are calculated in terms of radiation dose and associated health effects in the exposed populations. Radiation doses are presented in units of roentgen equivalent man (rem) or millirem (one-thousandth of a rem, or mrem) for individuals and person-rem for populations.

Exposure During Onsite Cleanup Activities

DOE's health risk analysis for Area IV and the Northern Buffer Zone was considered to be representative of overall SSFL site cleanup activities because radioactive materials would be removed in a similar manner, employing the same protections and controls to limit radiation exposure within regulatory limits.

Exposure During Transportation

Per-shipment risk factors were calculated for the collective populations of exposed persons and for the transport crew for all anticipated routes and shipment configurations (DOE, 2017). Radiological risks were presented in per-shipment doses for each unique route, material, and container combination.[6] The maximum dose resulting from transporting radioactive waste to each disposal facility was estimated using truck and intermodal transport methods (DOE, 2017). These tabulated values rely on procedures that limit the external radiation from each truck to a fixed dose rate that is much less than the allowable public exposure. The highest truck driver dose is 1.9×10^{-4} person-rem per truck trip to Energy*Solutions* (see Table 3-6 of DOE's Draft EIS [DOE, 2017]) in an intermodal container. For the residential population, the dose is 4.9×10^{-5} person-rem per truck trip for shipment to Energy*Solutions* in a B-25 box or intermodal container (DOE, 2017).

In order to calculate the maximum annual population exposure associated with the project, the highest per-shipment risk factors were multiplied by the total maximum number of truck trips associated with the project. This represents a conservative assessment of risk because of the high risk value and the assumption that the project trucks would produce the same amount of exposure as the trucks assumed in the DOE EIS. Calculation of the maximum annual population exposure requires the total number of annual truck trips transporting LLRW and MLLRW. The total number of truck trips for soils exceeding radioisotope LUT values was estimated to be 8,750 (5,940 DOE truck trips, 1,700 NASA truck trips, and 1,110 Boeing truck trips), as shown in Table 3-4. Although the number of truck trips estimated for the overall site cleanup is greater than that analyzed by DOE, the total amount of radioactive material to be excavated from the project site is the same.[7] The overall site cleanup assumes that trucks would be loaded differently with

6 The radiological risks would result from potential exposure of people to external radiation from the packaged waste. The exposed population includes people living along the route, pedestrian and car occupants along the route, and at public rest and fuel stops.

7 This means that this analysis is conservative, because if the same amount of radioactive material were to be distributed among a greater number of truck loads and truck trips, then the radiation exposure to crew and population from each truck trip would actually be proportionately less than assumed by DOE.

less material per shipment than what was assumed by DOE, the result being that more trucks would be needed to transport the same amount of LLRW and MLLRW from the project site to disposal facilities. This means that the risk of exposure associated with the project would be lower than the risk of exposure for the project described in DOE's EIS, because the same amount of radioactive material would be distributed among a greater number of trucks (and therefore the per-truck exposure is less).

DOE's highest radiation dose per truck shipment for the offsite population was used to estimate the project's transportation risk to residents (DOE, 2017).[8] Risks were calculated by multiplying the highest per-shipment radiation dose by the maximum annual number of shipments over the duration of the project, which represents a conservative estimate of risk, and depends on the final repository for the materials. The maximum annual number of shipments over the duration of the project was estimated for three scenarios to provide a range in estimates of risks from the transportation of radioactive waste, from a worst-case scenario to a best-case scenario, as discussed below.

As shown in Table 3-4 of this PEIR, the total number of truck trips for soil exceeding provisional radiological LUT and radiological/mixed soil concentration is 8,750. The exact phasing and scheduling of these truck trips is currently unknown. Consequently, in order to provide a reasonable range of annual exposure, these trips were distributed over time in three separate scenarios:

- Scenario 1: 1.5-Year Schedule. This assumes that all truck trips associated with each RP's activity would overlap during the first 1.5 years of the project. The total maximum number of annual truck trips for radioactive waste, for purposes of calculating the worst-case population exposure, was assumed to be 6,860. This represents 5,940 DOE trips over 17.6 months (4,047 max per year, assuming even distribution), 1,700 NASA truck trips over 12 months, and 1,110 Boeing truck trips over 12 months (see Tables 3-4, 3-9, and 3-10 in this PEIR). This scenario represents a highly conservative assumption for annual radiation exposure to the public, as these activities may extend over a period of 3 to 5 years or longer.
- Scenario 2: 3-Year Schedule. This assumes radioactive material would be removed evenly over the course of 3 years and assumes that the truck trips for each RP would be sequential and not overlap. Consequently, the maximum annual number of truck trips would be 2,914.
- Scenario 3: 5-Year Schedule. This assumes radioactive material would be removed evenly over the course of 5 years and assumes that the truck trips for each RP would be sequential and not overlap. Consequently, the maximum annual number of truck trips would be 1,748.

Table 4.7-2 below presents the number of truck trips assumed for each scenario and RP, as discussed above.

[8] The calculated radiation dose is the total effective dose equivalent (see Title 10, Code of Federal Regulations, Part 20 [10 CFR Part 20]), which is the sum of the effective dose equivalent from external radiation exposure and the 50-year committed effective dose equivalent from internal radiation exposure (DOE, 2017).

TABLE 4.7-2
ANNUAL TRUCK TRIPS TRANSPORTING RADIOACTIVE MATERIAL FOR EACH SCENARIO AND RP

Truck Trips and Duration by RP	Scenario 1: 1-Year Schedule	Scenario 2: 3-Year Schedule	Scenario 3: 5-Year Schedule
Total Trips			
DOE	5,940	5,940	5,940
NASA	1,700	1,700	1,700
BOEING	1,110	1,110	1,110
Total	*8,750*	*8,750*	*8,750*
Total Duration (months)			
DOE	17.6	36	60
NASA	12	36	60
BOEING	12	36	60
Total	*17.6*	*36*	*60*
Maximum Annual Trips			
DOE	4,050	1,980	1,188
NASA	1,700	567	340
BOEING	1,110	367	220
Total	*6,860*	*2,914*	*1,748*

The following equation was used by DOE to calculate incident-free and accident transportation risks for the general population (**Equation 1**), as discussed above. This equation was adapted to calculate the potential for incident-free and accident radiological exposure from transportation associated with the project based on the number of truck trips presented above in Table 4.7-2.

Equation 1: Radiological dose for general population (incident-free) and accident risk.

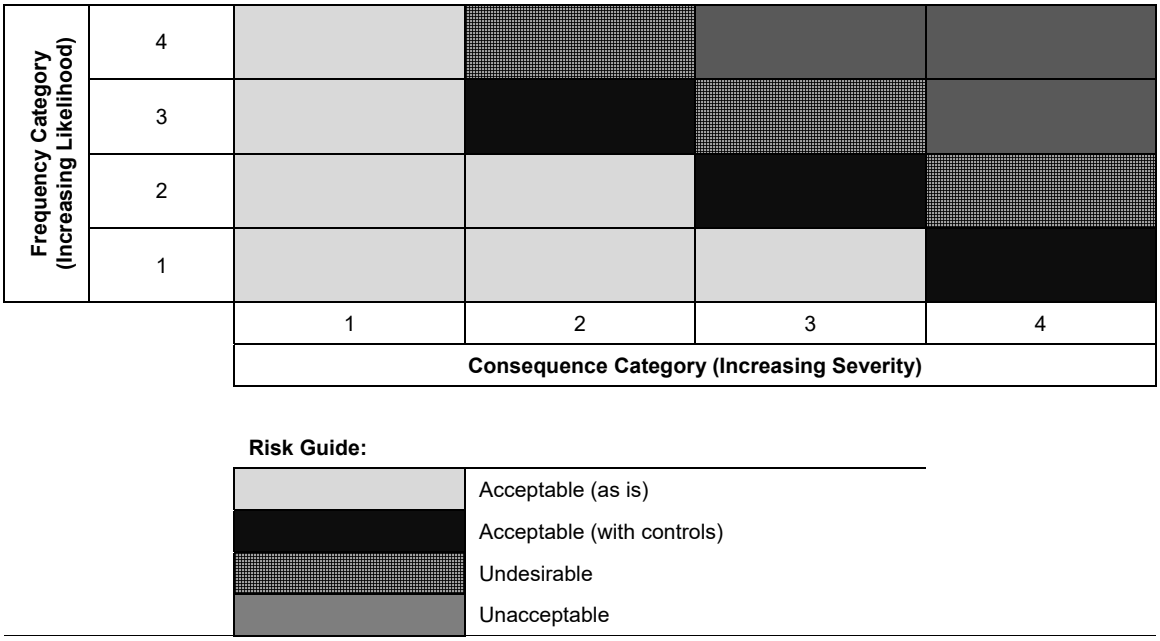
$$Total\ Dose\ = RF_t * Conv * T_y$$

Where:
- Total Dose = Total radiological dosage, mrem per year
- RF_t = Risk factor for transportation type, person-rem per truck trip = 1.9x10-4 per truck for incident-free exposure (representing truck-only shipments to EnergySolutions via intermodal container or B-25 box), and 6.0x10-13 per truck for accident exposure (representing shipments to EnergySolutions via B-25 box; this value includes the chance of an accident occurring, which is why it is less than the incident-free factor) (DOE, 2017)
- Conv = Conversion factor from rem to mrem, = 1,000 mrem/rem
- T_y = Maximum number of trucks per year (see Table 4.7-2 above)

4.7.4.3 Accidental Release of Hazardous Material

The analysis of impacts from an accidental upset or release of hazardous materials is comprised of two components: the likelihood of occurrence and the severity of the consequence. In order to better present the risk and consequence relationship of an accidental release, the Center for Chemical Process Safety Guidelines for Hazard Evaluation Procedures developed a risk assessment matrix, reproduced as **Table 4.7-3**.

TABLE 4.7-3
RELEASE RISK ASSESSMENT MATRIX



SOURCE: Center for Chemical Process Safety (CCPS), Guidelines for Hazard Evaluation Procedure, 2008.

The frequency of occurrence for an upset condition or accidental release is defined as follows, based on Center for Chemical Process Safety (CCPS) Guidelines (CCPS, 2008), for increasing likelihood.

Frequency Category

1. Very unlikely to unlikely, but possible (not expected during facility lifetime).
2. Likely to occur during lifetime (expected to occur no more than once during facility lifetime).
3. Will occur several times over life of process (expected to occur several times during facility lifetime).
4. Likely to occur frequently (expected to occur more than once in a year).

The CCPS defines the consequence of an accident as follows, for increasing severity.

Consequence Category

1. Negligible – No injury or health effects, or less than minor injury, occupational illness, or system damage.
2. Marginal – Minor injury, minor occupational illness, or minor system damage.
3. Critical – Severe injury, severe occupational illness, or major system damage.
4. Catastrophic – Death or system loss.

The acceptability of the risk posed by a specific future hypothetical scenario is assessed by qualitatively identifying the appropriate consequence category along the horizontal axis of the matrix and the appropriate frequency category along the vertical axis. The intersection of those two categories defines the acceptability of the risk, color coded in the table above.

For the purposes of this analysis, remedial activities would include the excavation of soils, offsite hauling of excavated soil, demolition and removal of facilities, and the installation and operation of soil and groundwater treatment systems (e.g., soil vapor extraction systems, biotreatment systems, extraction wells, groundwater treatment systems). These activities would occur at various times spread out over time across the entire project site. Operational activities would include the operational phases of treatment technologies (soil vapor extraction, groundwater extraction and treatment, in situ or ex situ bioremediation, air sparging systems, etc.), but do not include soil excavation. In addition, the operations activities include the post-treatment monitoring activities conducted to verify that remedial objectives have been achieved.

4.7.5 Analysis of Project Impacts

The following text describes the potential environmental impacts related to hazards and hazardous materials associated with implementing the overall site cleanup and initial activities, demarcated as impact "a" and "b" respectively. As presented in Section 3.7, *Initial Activities*, of this PEIR, the initial activities include eight different projects. Depending on the degree to which impacts of the initial activities would be similar to or different from each other, the impact analysis for the initial activities for some thresholds has been combined accordingly (i.e., the number of separate discussions for impact for each threshold ranges from one to eight). Following each potential impact is a significance determination for each potential impact. Each impact discussion concludes with a significance determination.

4.7.5.1 Transport, Disposal, and Use of Hazardous Materials

Program Assessment

Impact 4.7-1a: Would implementation of the **overall site cleanup** create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?

Overall Site Cleanup (Impact 4.7-1a)

The overall site cleanup would result in short-term emissions of DPM, which is a TAC. DPM emissions would result from both onsite construction equipment as well as offsite truck trips. In

addition to DPM, COCs contained in soil would also be emitted during soil handling activities, road dust entrainment and wind erosion. Volatile compounds treated using the soil vapor extraction system would achieve capture efficiencies of at least 98 percent, however small quantities of volatile COCs may be emitted during the treatment process.

Because lifetime risk is additive in nature, the risk from onsite sources is combined with that from offsite sources to determine the maximum incremental increase risk scenario associated with the overall site cleanup. Because the threshold for allowable incremental increase in cancer risk is over an individual's lifetime, the health risk assessment in this PEIR takes into account the risks from exposure to emissions generated during the overall site cleanup activities, the initial activities, and long-term monitoring and maintenance. Assumptions and calculations for the health risk assessment are included in Appendix F of this PEIR.

Table 4.7-4 shows the maximum lifetime unmitigated incremental increase in cancer risk and chronic non-cancer risk for offsite receptors taking into account onsite COC emissions.

TABLE 4.7-4
OFFSITE SENSITIVE RECEPTOR INCREMENTAL CANCER RISK IMPACTS – UNMITIGATED [a]

	Cancer Risk (per million)	Chronic Risk Hazard Index (HI)	Acute Risk Hazard Index (HI)
Residential	6.6	0.04	0.04
Significance threshold	10	1	1
Exceeds threshold?	No	No	No

[a] Cancer risk values based on a 15-year exposure duration of maximum levels of all chemicals, which is a hypothetical and very conservative set of assumptions.

See Appendix F for additional details and modeling data.

SOURCE: ESA, 2017c (see Appendix F of this PEIR).

As shown, the maximum incremental increase in cancer risk would be up to approximately 6.6 in one million, which would not exceed the SCAQMD significance threshold of 10 in one million. Both the chronic and acute hazard risk related to cleanup activities would be up to approximately 0.04, both of which would not exceed the SCAQMD significance threshold of one. Therefore, the unmitigated health risk would not result in a potentially significant impact and mitigation measures would not be required.

Health risk impact values presented in Table 4.7-4 represent the combined impact from the various chemicals that would be emitted during cleanup activities. In order to identify the health risk impact contribution by each source and chemical, the MEI has been further analyzed to identify source and chemical contribution. The details of these maxima are listed on **Table 4.7-5**.

TABLE 4.7-5
MAXIMUM EXPOSED INDIVIDUAL (MEI) CONTRIBUTION BY CHEMICAL - UNMITIGATED [a]

Cancer Risk (MEI)

Chemical	Cancer Risk Contribution (per million)	Percent of Total
Total	**6.6**	
Diesel Particulate Matter	5.3	81.5%
Arsenic	0.5	7.3%
Chromium (VI)	0.2	3.8%
2,3,7,8-TCDD	0.2	2.4%
Cadmium	0.1	1.7%
PCBs	0.1	1.2%

Chronic Risk (MEI)

Chemical	Chronic Risk Contribution	Percent of Total
Total	**0.04**	
Arsenic	0.03	68%
Manganese	0.01	32%

Acute Risk (MEI)

Chemical	Acute Hazard Index Contribution	Percent of Total
Total	**0.04**	
Benzene	0.02	67%
Nickel	0.01	33%

[a] Cancer risk values based on a 15-year exposure duration. Analysis includes inhalation, soil ingestion, dermal, mother's milk, and home grown produce for residential receptors.

See Appendix F of this PEIR for additional details and modeling data.

SOURCE: ESA, 2017c (see Appendix F).

As shown in Table 4.7-5, DPM contributes to 81.5 percent of the total cancer risk and arsenic contributes 68 percent of the total chronic hazard index. Benzene emissions contribute 67 percent of the acute hazard index. Risks at all other receptor locations would be less than these maximum values.

Despite the unmitigated health risk impact of this project is insignificant, this project would still implement Mitigation Measures AQ-1 and GHG-2 to reduce NO_X emissions, which would also result in lower DPM emissions. **Table 4.7-6** shows the incremental increase in cancer risk and non-cancer hazard index including Mitigation Measures AQ-1 and GHG-2. As shown, the maximum mitigated incremental increase in cancer risk would be approximately 1.7 in one million, which would be further below the SCAQMD significance threshold of 10 in one million.

TABLE 4.7-6
OFFSITE SENSITIVE RECEPTOR INCREMENTAL CANCER RISK IMPACTS [a]

	Cancer Risk (per million)
Residential	1.7
Significance threshold	10
Exceeds threshold?	No

[a] Mitigation measures are discussed separately. Cancer risk values based on a 15-year exposure duration of maximum levels of all chemicals, which is a hypothetical and very conservative set of assumptions.

See Appendix F of this PEIR for additional details and modeling data.

SOURCE: ESA, 2017c (see Appendix F).

After cleanup activities are complete, an O&M Plan would describe procedures and requirements for monitoring the effectiveness of the implemented remedial actions and follow-up remedial actions in the event that chemical and/or radionuclide concentrations exceed cleanup requirements. Once remediation efforts are complete and the O&M Plan monitoring has verified treatment effectiveness, all treatment equipment and chemicals would be removed from the site. Soil with chemical or radionuclide concentrations above cleanup requirements would have been removed or treated as required by the AOCs and 2007 Consent Order. Excavation and remediation activities would end and there would be no routine transport, use or disposal of radioactive waste.

Radioactive Exposure During Onsite Cleanup Activities

The overall site cleanup would expose individuals to levels of radiation no higher than analyzed in the EIS (based on DOE's and USEPA's assessment of exposure). The overall site cleanup would employ the same protections and controls as identified by DOE to limit radiation exposure within regulatory limits (as discussed and summarized above). Consequently, the conclusions from that document are also applicable to the overall site cleanup project. Workers handling radioactive materials would be required by federal regulations (e.g., 10 CFR Parts 835 and 851) to employ radiation protection practices to ensure worker doses are as low as reasonably achievable below occupational exposure limits (DOE, 2017).[9]

In addition to the measures to limit radiological exposures to workers, the overall site cleanup would implement Mitigation Measure AQ-3 to monitor and control fugitive dust emissions by measures prescribed by VCAPCD Rule 55. This measure would limit general inhalation of soil and other demolition material particulates by workers and the public, and therefore also reduce risk of inadvertent radiological exposure.

[9] "As low as is reasonably achievable" (ALARA) is the approach to radiation protection to manage and control exposures (both individual and collective) to the work force and to the general public to as low as is reasonable, taking into account social, technical, economic, practical, and public policy considerations. ALARA is not a dose limit, but a process which has the objective of attaining doses as far below the applicable limits as is reasonably achievable (10 CFR Part 835).

Because the overall site cleanup would involve radiological exposures that are as low as reasonably achievable and below occupational exposure limit, the radiological impact on human health is less than significant.

Transportation of Radioactive Materials

The maximum exposure risk during the transportation of radioactive waste to each disposal facility under each alternative was calculated to range between $5x10^{-12}$ to $4x10^{-9}$ (DOE, 2017). The maximum estimated dose to workers was identified to be 2 rem per year and the maximum estimated dose to the public was estimated to be $4.2x10^{-7}$. Federal regulations limit radiation exposure to 10 millirem per hour at a distance of 6.6 feet from outside a vehicle. Radiation exposure associated with the project is expected to be on the order of 0.01 millirem per hour or less at a distance of 3.3 feet (DOE, 2017).

In addition, in the event that soils are discovered with radioactivity above the USDOT and USNRC standards, Mitigation Measure HAZ-2 requires that such materials be packaged in accordance with regulations, transported by licensed radioactive materials haulers, and disposed of at a licensed radioactive materials management facility. Meanwhile, to ensure vehicular safety at the entrance and exit points of the site, as well as for offsite transport to and from the project site, Mitigation Measure TRANS-1 would require the RPs to prepare and implement a comprehensive Traffic Management Plan for DTSC review, which would include a traffic control plan and hazardous materials transport plan. With implementation of Mitigation Measure TRANS-1, truck trips would be limited to off-peak traffic hours, when traffic levels on these roads are lower.

As discussed in section 4.7.4.2, the overall site cleanup would not involve the removal of more LLRW than was assumed in DOE's analysis; in other words, the amount of LLRW to be removed as part of the project is the same amount as assessed by the DOE EIS. Therefore, the total amount of radioactive material that workers would be exposed to would be the same for the overall site cleanup as was evaluated by DOE. In addition, the overall site cleanup would employ the same protections and controls to limit radiation exposure assumed by DOE. Consequently, radiation levels of the radioactive waste shipments would be on the order of 0.01 mrem per hour or less at 3.3 feet from each package, which is well below the regulatory limit of 2 mrem per hour.

During incident-free transportation of radioactive materials associated with the overall site cleanup, a radiological dose results from exposure to the external radiation field that surrounds the shipping containers. The population dose is a function of the number of people exposed, their proximity to the containers, their duration of exposure, and the intensity of the radiation field surrounding the containers. Radiological impacts were estimated for both workers and the general population during incident-free transportation. For truck shipments, workers were the drivers of the shipment vehicles. The general population analyzed included persons residing within 0.5 mile of the truck route, persons sharing the road, and persons at truck stops. Exposures to workers loading and unloading shipments were not estimated (DOE, 2017).

Using Equation 1 and the DOE per-trip risk factors presented above, the maximum incident-free transportation risk to population is 336 rem per year for Scenario 1, 143 rem per year for

Scenario 2, and 86 rem per year for Scenario 3. These results are presented in **Table 4.7-7**. Scenarios 1 and 2 exceed the DOE limit of 100 mrem per year for population. Therefore, the incident-free transportation risk to population would be a potentially significant impact and mitigation measures would be required.

TABLE 4.7-7
INCIDENT-FREE TRANSPORTATION RISK TO POPULATION BY SCENARIO

Category	Scenario 1: 1.5 year	Scenario 2: 3-Year	Scenario 3: 5-Year
Maximum annual trips [a]	6,860	2,914	1,748
Risk factor (person-rem per trip) [b]	$1.9x10^{-45}$	$1.9x10^{-4}$	$1.9x10^{-4}$
Person-rem per year	336	143	86
Regulatory limit (person-rem per year)	100	100	100
Over limit?	**Yes**	**Yes**	No
Percent reduction in trips or risk factor needed to meet limit	70%	30%	n/a

NOTES:
a. From Table 4.7-2 above.
b. DOE, 2017; Table H-4 for Truck shipment to Energy*Solutions* in a B-25 box or intermodal container.

In order to reduce the impact below the significance threshold, the total annual number of truck trips transporting LLRW and MLLRW must be limited to no more than 2,080 trips. This annual limit is required through Mitigation Measure HAZ-5. Through implementation of this mitigation measure, assuming 260 work days per year, the average daily number of truck trips transporting LLRW and MLLRW would be 8, which is slightly greater than what was assumed in Scenario 3 (1,748 annual trips or 7 trips per day on average). It should also be noted that if the per-trip risk factors could be reduced by limiting the external radiation dose rates for each shipment of LLRW/MLLRW, the total annual risk could drop below the DOE limit of 100 mrem per year for the general population (DOE, 2017). A reduction of 30 percent in the per-trip risk factors would enable Scenario 2 to meet the DOE regulatory limit and a reduction of 70 percent would enable Scenario 1 to meet the DOE regulatory limit (DOE, 2017). This is also presented in Table 4.7-7.

Conclusion: Compliance with cleanup decision documents and Mitigation Measures TRANS-1, HAZ-2, and HAZ-5 would reduce impacts associated with the routine transport, use or disposal of hazardous materials to less than significant levels. Therefore, impacts related to the routine transport, use or disposal of hazardous materials during implementation of the overall site cleanup would be less than significant with mitigation.

Impact 4.7-1a Determination: *Implementation of the* ***overall site cleanup*** *could create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials. Mitigation Measures TRANS-1, HAZ-2 and HAZ-5 would reduce this impact. This impact would be* ***less than significant with mitigation.***

Initial Project Assessment

Impact 4.7-1b: Would implementation of the **initial activities** create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?

Initial Activities (Impact 4.7-1b)

As discussed previously for the overall site cleanup, project remediation activities would result in emissions of COCs from soil handling activities and DPM from equipment exhaust. Cancer risk is cumulative over the lifetime of the individual receptor. Because cancer risk would be cumulative over the entire remediation period, and because the initial activities represent a small portion of the overall project, localized cancer risk associated with the initial activities would not accurately represent overall risk of the project without inclusion of the overall site cleanup activities. As shown in Table 4.7-4, the maximum incremental increase in cancer risk would be up to approximately 6.6 in one million without mitigation, which would not exceed the SCAQMD significance threshold of 10 in one million. The chronic and acute hazard index related to cleanup activities would both be up to approximately 0.04, both of which would be below the SCAQMD significance threshold of 1.0. In addition, with the proposed NO_X and PM reduction related Mitigation Measures AQ-1, AQ-5 and GHG-2, the cancer risk would be further reduced to 1.7 in a million (see Table 4.7-6). Therefore, the health risks from exposure to emissions from general cleanup activities would be below the significance thresholds, impacts from initial activities would be less than significant.

With regard to handling and transport of radioactive materials, radiation exposure would be reduced to less-than-significant levels with implementation of Mitigation Measures TRANS-1, HAZ-2 and HAZ-5. As shown in Table 4.7-7, Scenario 3 would incorporate HAZ-5 reducing the annual risk to 86 mrem, which is below the DOE limit of 100 mrem. Therefore, health risk impacts from initial activities with regard to radioactive materials would also be less than significant with the implementation of Mitigation Measure HAZ-5.

> Conclusion: Compliance with cleanup decision documents and Mitigation Measures TRANS-1, HAZ-2, and HAZ-5 would reduce impacts associated with the routine transport, use or disposal of hazardous materials. Impacts related to the routine transport, use or disposal of hazardous materials during implementation of the initial activities would be less than significant with mitigation.

Impact 4.7-1b Determination: *Implementation of the **initial activities** could create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials. Mitigation Measures TRANS-1, HAZ-2, and HAZ-5 would reduce this impact. This impact would be **less than significant with mitigation**.*

4.7.5.2 Reasonably Foreseeable Upset and Accident Conditions

Program Assessment

Impact 4.7-2a: Would implementation of the **overall site cleanup** create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Overall Site Cleanup (Impact 4.7-2a)

Potential hazards caused by routine use or reasonably foreseeable accident conditions would include spills involving the soil, groundwater, demolition materials, and lead shot removed and transported from the project site that contain chemicals and radionuclides above cleanup levels, as well as chemicals brought to and used at the site (fuels, lubricants, paint, and solvents, as well as the chemical agents used to treat soil or groundwater). The impacts related to the presence of chemical amendments injected into or placed within soil and groundwater is analyzed under Impact 4.7-6a.

Implementation of the overall site cleanup would involve several processes, which may be subject to accidental release or upset conditions. Trucks involved in the transport of contaminated materials offsite (long distance hauling) may experience an accident resulting in a spill. The potential for an accident resulting in a spill and the consequences of such a spill are analyzed in this section. Equipment involved in the excavation and consolidation of onsite materials are not expected to operate on public streets; therefore, it is not expected that these activities would result in an acute, accidental release to the environment.

Onsite Accidental Release

The proposed remediation activities would require the use of equipment such as trucks, excavators and other heavy equipment, drill rigs, pumps, and blowers. Unless powered by onsite electrical power, the equipment would use fuels (gasoline or diesel) and lubricants (oils and greases). Given the site location and the number of heavy equipment anticipated to be used, gasoline and/or diesel fuel may be delivered to the project site in bulk, stored onsite in above ground storage tanks (ASTs) or brought onsite by a mobile re-fueler, and dispensed as needed into individual pieces of equipment. A mobile maintenance vendor may be called onsite for routine maintenance, but equipment would likely be taken offsite if significant maintenance or repair would be required. Some of the treatment technologies would require the installation and operation of facilities such as vapor or groundwater extraction systems, monitoring wells, and piping between wells and treatment systems. The facilities may house and involve the handling of glues, solvents, paint, thinners, or other chemicals. In addition, as discussed in Section 3.6, *Overall Site Cleanup*, certain treatment technologies would use chemical amendments to promote the treatment of chemicals in soil or groundwater; these chemical amendments would be transported to and handled at the project site. The drivers/operators of the delivery trucks and material handlers would be trained and equipped to respond to an accidental spill or release, should one occur. Operators of heavy-duty equipment would be trained to remain alert and stationed nearby during fueling of equipment, and spills, should they occur, should not reach the offsite environment. Failure of any onsite gasoline and/or diesel fuel ASTs, if present on the

project site, would be possible. With controls, such as secondary containment, an accidental spill or release would not reach the offsite environment. An accidental spill or release would be treated and remediated in accordance with applicable regulations. Although unlikely, it is possible that a device, such as a hose, valve, clamp, tank, or reservoir, on the heavy equipment or ASTs could rupture or leak. This equipment would operate exclusively onsite, and as such, even if a leak or spill occurred, the material would be contained within the secondary containment controls and it is highly unlikely that the material would reach the offsite environment. Therefore, reasonably foreseeable onsite spills and accident conditions involving the release of hazardous materials would not result in an adverse impact to workers during cleanup activities, potential visitors to the project site after cleanup is complete, or the environment both during and after cleanup activities. These onsite impacts are considered less than significant

Offsite Accidental Release (Truck Transport within California)

Impacted materials, particularly soil with chemicals and/or radionuclides at concentrations above cleanup requirements, would be removed and transported from the project site to offsite disposal facilities. With respect to the transport of contaminated materials offsite, not all of the materials to be transported are likely to contain acutely hazardous materials (AHMs). AHMs are regulated by the USEPA and the State OES because they can pose an immediate threat in an upset or accidental release scenario if found in their pure form or at high concentrations above specified threshold quantities. Some of the impacted material at the project site contain chemicals classified as AHMs, as defined in 40 CFR Part 355 Appendix A, and include fluorine compounds, furans, hydrazine compounds, N-nitrosodimethylamine, and nitric acid (refer to Table 4.7-1). Table 3-4 of this PEIR provides a summary of the estimated volumes of soil waste types. As shown therein, the estimated proportion of soil waste types characterized as non-hazardous is approximately 62 percent of the total. Furthermore, Section 4.6, *Greenhouse Gas*, of this PEIR, provides a quantitative analysis of truck vehicle miles traveled (VMT) associated with hazardous or radiological impacted material transport. For the purposes of this analysis, consistent with the GHG analysis, the VMT associated with the transport of hazardous or radiological impacted material removed by truck was assumed to contain AHMs.

For trucks, the probability of an accident involving a collision is dependent upon the highway category and truck configuration, as cited in a study prepared by the Argonne National Laboratory (Argonne National Laboratory, 1996). In general, highways categorized as rural have lower truck accident involvement rates per million miles of truck travel compared to highways categorized as urban. The maximum truck accident involvement rates per million miles of truck travel across different truck configurations (i.e., single unit, single combined, double combined, etc.) is 1.18 for rural highways and 2.18 for urban highways (Argonne National Laboratory, 1996). The rural and urban categories are based on population densities. The U.S. Census Bureau provides a statistical definition of urban and rural based on measures of population size and density. For the 2010 Census, an urban area comprises census tracts or census blocks that, among other requirements, encompass at least 2,500 people (76 Fed. Reg. 164 (August 24, 2011) 53029-53043). Rural areas are all other areas not classified as urban. Not all collisions would result in a breach of the container and release to the environment. The probability of a release of a solid

hazardous cargo is approximately 9.1 percent for solid materials (Argonne National Laboratory, 1996).

The transport of export impacted material associated with implementation of the overall site cleanup would require approximately 18.26 million VMT for outbound trips, which is equal to one-half of the total VMT driven by these trucks. Inbound trips are not included in the VMT estimate since they would not contain AHMs. Trucks would travel through areas categorized as urban and rural. In general, travel on highways within Ventura, Los Angeles, western Riverside, and southwestern San Bernardino counties would be categorized primarily as urban based on the U.S. Census Bureau statistical definition of urban and rural. In general, trips occurring on highways in the San Joaquin Valley, Mojave Desert portions of Riverside, and San Bernardino counties, Imperial County, Inyo County, and areas outside of California would be a mix of urban and rural areas, but the majority would be categorized as rural based on the U.S. Census Bureau statistical definition of urban and rural. On average approximately one-third of the VMT would occur on highways categorized as urban areas and two-thirds would occur on highways categorized as rural areas based on an analysis of U.S. Census Bureau data using census block groups (i.e., census block groups with greater than or less than 2,500 people). The use of census block groups to delineate urban and rural areas is a reasonable and conservative assumption as the U.S. Census Bureau statistical definition can be based on population levels in smaller census block areas. In order to add an additional layer of environmental and health protection, this assessment assumes an urban/rural split of 50 percent each instead of one-third urban and two-thirds rural.

As discussed above, since highways located in urban areas would be expected to have truck accident involvement rates higher than rural areas, assuming a one-half, rather than one-third, urban categorization rate results in a conservative assessment. Based on the rate of 1.18 collisions per 1,000,000 miles traveled for rural highways and 2.18 collisions per 1,000,000 miles traveled for urban highways, the overall site cleanup would pose a mathematical collision chance of 30.68 for hazardous waste transport, where 1.0 means a collision is likely to occur once during the lifetime of the activity. With a release rate of 9.1 percent of accidents, the probability of a release of AHM in transport to offsite receiver landfills would be 2.79. Risk of upset calculations are detailed in Appendix G. Excavation associated with implementation of the overall site cleanup would occur over approximately 15 years. Thus, the annual average VMT for outbound truck trips potentially containing AHM is estimated to be approximately 1.22 million VMT. On an annual average basis, the probability of a release of AHM in transport to offsite receiver landfills would be approximately 0.19. Therefore, during the approximate 15 years of overall site cleanup, a collision involving a truck transporting this material resulting in a release would be likely to occur less than once per year, but could occur several times over a 15-year duration, which is defined as a frequency category 3 in Table 4.7-3.

As discussed previously, reasonably foreseeable spills and accident conditions could occur involving the release of hazardous materials, which could be an adverse impact to the public and environment along offsite transportation routes. The severity ranges if exposure were to occur could potentially exceed consequence category 1 and could fall within the marginal or greater

category. The proposed remediation activities would not result in consequence category 4 impacts since the transport of AHM, although potentially present at concentrations above cleanup requirements, would not be in their pure form or at high concentrations. As a result, implementation of the overall site cleanup could result in a risk level that could be considered "undesirable" as shown in Table 4.7-3. Drivers of waste hauling trucks are required to be trained to respond to and contain releases, to notify appropriate emergency responders if necessary, and to utilize and implement appropriate controls, preventative measures, and best management practices. Nonetheless, impacts associated with the potential for accidental upset or release from trucks involved in the transport of contaminated materials offsite would be potentially significant and mitigation would be required.

There are various federal, state, and local regulations that control the use, transportation, storage, and disposal of hazardous materials. Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2 and TRANS-1 would reduce the potential hazards of the routine use, storage, disposal, or accidental spills.

> Conclusion: Compliance with cleanup decision documents, County permits, and Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1 would ensure that hazardous materials would be properly managed and transported to prevent or minimize releases, and any spills would be immediately cleaned up in the event of an accidental release. However, when considering the potential risk of upset impacts for the overall site cleanup, a collision involving a truck transporting material resulting in a release could potentially occur several times over the duration even with the implementation of feasible mitigation measures. Because the trucks would need to travel to appropriate offsite receiver landfills that are permitted to handle the waste types, it is not feasible to restrict the distances trucks travel. Therefore, impacts related to routine use or reasonably foreseeable upset and accident conditions involving hazardous materials for the overall site cleanup would be significant and unavoidable.

Offsite Accidental Release (Truck Transport outside of California)

The transport of export impacted material associated with implementation of the overall site cleanup is expected to require travel outside of California. The risk of upset calculations for truck travel outside of California is provided for information purposes. The transport of export impacted material is expected to require approximately 2.34 million VMT for outbound trips outside California. Based on the rate of 1.18 collisions per 1,000,000 miles traveled for rural highways and 2.18 collisions per 1,000,000 miles traveled for urban highways (based on a 50/50 percent split), the overall site cleanup would pose a mathematical incremental collision chance of 3.92 for hazardous waste transport, where 1.0 means a collision is likely to occur once during the lifetime of the activity. With a release rate of 9.1 percent of accidents, the probability of a release of AHM in transport to offsite receiver landfills outside California would be approximately 0.36.

Offsite Accidental Release (Radioactive Materials)

Under accident conditions, the population would be exposed to radiation from released radioactivity if the package were damaged and would receive an external radiation dose if the

package were not breached. Risk factors for transportation accidents are given for radiological impacts in terms of person-rems in the exposed population for both crew and the general population. According to DOE, the accident dose risks would be very low because the likelihood of accidents leading to confinement breach of a package or shipping cask and release of its contents would be small, and the content and form of the wastes (solids) are such that a breach would lead to a nondispersible and mostly noncombustible release.

Using Equation 1 above, the maximum accident transportation is 4.1x10-6 rem per year for Scenario 1, 1.1x10-7 rem per year for Scenario 2, and 6.7x10-8 rem per year for Scenario 3. These results are presented below in **Table 4.7-8**. The exposure for all three scenarios are well below the DOE limit of 100 mrem per year. Therefore, the accident transportation risk is less than significant.

TABLE 4.7-8
ACCIDENT TRANSPORTATION RISK TO POPULATION BY SCENARIO

Category	Scenario 1: 1.5-Year	Scenario 2: 3-Year	Scenario 3: 5-Year
Maximum annual trips [a]	6,860	2,914	1,748
Risk factor (person-rem per trip) [b]	$6.0x10^{-13}$	$6.0x10^{-13}$	$6.0x10^{-13}$
Person-rem per year	$4.1x10^{-6}$	$1.1x10^{-7}$	$6.7x10^{-8}$
Regulatory limit (person-rem per year)	100	100	100
Over limit?	No	No	No

a. From Table 4.7-2 above.
b. DOE, 2017; Table H-4 for Truck shipment to Energy*Solutions* in a B-25 box.

Impact 4.7-2a Determination: *Implementation of the* ***overall site cleanup*** *would create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1 would reduce this impact. However, this impact would be* ***significant and unavoidable****.*

Initial Project Assessment

Impact 4.7-2b: Would implementation of the **initial activities** create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

DOE and NASA Initial Activities (Impact 4.7-2b)

These initial activities would include the excavation, transport, and disposal of soil that may be defined as hazardous according to RCRA. Excavation and transport activities would include the use of fuels and lubricants for equipment. Soil with radionuclides would be transported to one or more offsite permitted radioactive materials disposal facilities licensed to accept waste with

radionuclides. Soil with chemical concentrations above hazardous waste levels would be disposed of at a RCRA permitted Class I hazardous waste facility. Soil with chemical concentrations below hazardous waste levels (Class I) but above the cleanup requirements could be transported to permitted Class II (designated waste[10]) or III (nonhazardous waste) disposal facilities, depending on the acceptance criteria of the disposal facility. The excavated areas would be backfilled, recontoured and, if applicable, reseeded.

The potential for accidental upset or release of hazardous materials from the transport of contaminated materials during implementation of the initial activities is assessed using the same procedure discussed above for the overall site cleanup. For the purposes of this analysis, as a conservative basis, it was assumed all trucks transporting hazardous or radiological impacted material would haul material that could contain AHMs. The transport of export material would require approximately 3.46 million VMT for outbound trips for excavated soil and building demolition debris (see discussion below under "Remaining Initial Activities").

Based on the conservatively estimated urban/rural split rate of 50 percent, as discussed for the overall site cleanup, and a rate of 1.18 collisions per 1,000,000 miles traveled for rural highways and 2.18 collisions per 1,000,000 miles traveled for urban highways, the initial activities would pose a mathematical collision chance of 5.81, where 1.0 means a collision is likely to occur once during the lifetime of the activity. With a release rate of 9.1 percent of accidents, the probability of a release of AHM in transport to offsite receiver landfills would be 0.53. Risk of upset calculations are detailed in Appendix G of this PEIR. The initial activities, inclusive of soil excavation and building demolition, would occur over approximately 3 to 5 years. Thus, on an annual average basis, the probability of a release of AHM in transport to offsite receiver landfills would be 0.11 to 0.18. Therefore, during the approximate duration of the initial activities, a collision involving a truck transporting this material resulting in a release could occur during the lifetime of initial activities (if the 0.53 value is rounded up to the nearest whole number), but would not be expected to occur more than one time, which is defined as a frequency category 2 in Table 4.7-3.

As discussed previously, reasonably foreseeable spills and accident conditions could occur involving the release of hazardous materials, which could be an adverse impact to the public and environment along offsite transportation routes. The severity ranges if exposure were to occur could potentially exceed consequence category 1 and could fall within the marginal or greater category. The proposed remediation activities would not result in consequence category 4 impacts since the transport of AHM, although potentially present at concentrations above cleanup requirements, would not be in their pure form or at high concentrations. Thus, implementation of the initial activities could result in risk level that would be considered "acceptable (with controls)," as shown in Table 4.7-3. Drivers of waste hauling trucks are required to be trained to

[10] Designated waste is nonhazardous waste that consists of, or contains, pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state as contained in the appropriate state water quality control plan or is hazardous waste which has been granted a variance from hazardous waste management requirements (California Water Code Section 13173).

respond to and contain releases, to notify appropriate emergency responders if necessary, and to utilize and implement appropriate controls, preventative measures, and best management practices.

As explained previously in the overall site cleanup discussion (Impact 4.7-1a), DTSC-approved cleanup decision documents, existing hazardous materials handling regulations, and Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1 would ensure that hazardous materials are properly managed and transported during initial activities to prevent or minimize releases, and that any spills that might occur are immediately cleaned up in a manner that minimizes adverse effects.

Potential long-term impacts would be those that might occur after cleanup activities are complete once remediation objectives are met. As explained previously in the overall site cleanup discussion, following completion of all soil removal and restoration efforts, there would be no further use, transport, or disposal of any hazardous materials related to the initial activities. No long-term soil monitoring would be required because the soil would have been removed from the site. As a result, there would be no long-term impacts associated with routine use or upset and accident conditions with respect to the initial activities.

> Conclusion: Compliance with cleanup decision documents, County permits, and Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1 would ensure that hazardous materials would be properly managed and transported to prevent or minimize releases, and any spills would be immediately cleaned up in the event of an accidental release. The potential risk of upset impacts for the initial activities could result in risk level that would be considered "acceptable (with controls)." Therefore, impacts related to routine use or reasonably foreseeable upset and accident conditions involving hazardous materials for the DOE and NASA initial activities would be less than significant with mitigation incorporated.

The transport of export impacted material associated with implementation of the initial activities is expected to require travel outside California. The risk of upset calculations for truck travel outside California is provided for information purposes. The transport of export impacted material is expected to require approximately 420,235 VMT for outbound trips outside California. Based on the rate of 1.18 collisions per 1,000,000 miles traveled for rural highways and 2.18 collisions per 1,000,000 miles traveled for urban highways (based on a 50/50 percent split), the initial activities would pose a mathematical incremental collision chance of 0.71 for hazardous waste transport, where 1.0 means a collision is likely to occur once during the lifetime of the activity. With a release rate of 9.1 percent of accidents, the probability of a release of AHM in transport to offsite receiver landfills outside California would be approximately 0.06.

Remaining Initial Activities (Impact 4.7-2b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement projects as soon as possible after approval by DTSC. NASA's and DOE's initial excavation activities were addressed above; the analysis below is for the following initial activities:

- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The initial activities listed above would involve demolishing buildings and features using standard construction equipment and demolition techniques, followed by placing the demolition areas in a safe and stable configuration to facilitate later soil characterization and remediation. Some soil excavation may be necessary to facilitate removal of the vaults and/or building slabs. However, such soil would be investigated and cleaned up in accordance with the AOCs.

The demolition and disposal process would require the use of equipment, such as trucks and powered building demolition tools. Unless powered by onsite electrical power, the equipment would use fuels (gasoline or diesel) and lubricants (oils and greases). Building materials would be removed and transported from the project site to offsite disposal facilities. Reasonably foreseeable spills and accident conditions involving the release of hazardous materials could occur, which could be an adverse impact to workers during cleanup activities, visitors to the project site after cleanup is complete and the project site land use has been changed to open space or parklands, the public and environment along offsite transportation routes, or the environment both during and after cleanup activities.

DOE proposes to completely remove DOE's remaining 19 remnant facilities in Area IV, as described in Section 3.7.3.1, and shown in Figure 3-13. DOE would dispose of the materials from facilities that handled radioactive materials to low-level radioactive-waste disposal facilities, regardless of the waste characteristics or waste classification presented in Table 3-12, due to the history of these particular facilities and in accordance with California Executive Order No. D-62-02. Seven are sheds used for material storage, six are larger facilities, one is a building slab, and the remaining five are the facilities within the RMHF and HWMF, discussed in subsequent sections further in this section. DOE would prepare a building demolition plan for each facility and acquire a building permit from Ventura County. As part of decommissioning, surveys of building materials, through records searches and direct field screening or analytical testing, would be conducted for the presence of radionuclides and hazardous building materials (e.g., asbestos-containing materials, lead-based paint, and mercury). The selection of disposal or recycling facilities would be based on the survey results.

Cleanup activities related to the RCRA Post-Closure and Hazardous Waste Facility Closure would involve demolition of buildings and other physical infrastructure such as concrete, steel and appurtenances, along with minimal sampling, excavation and disposal of TTF soils and debris.

The proposed activities associated with the impoundment permits are limited to managing the existing impoundments through monitoring and periodic maintenance. The primary maintenance activities would include ongoing maintenance of the surface impoundment caps, surface water diversion facilities, and monitoring of the well network used to evaluate ongoing groundwater conditions. Monitoring would include regular inspections and monitoring of the impoundment caps, diversion facilities, and monitoring wells by a work crew of up to three people, and ongoing monitoring and evaluation of the impacted groundwater, in accordance with the conditions stipulated in the corresponding water quality sampling and analysis plan. DTSC will evaluate the need for additional cleanup at the impoundments based on the monitoring results for these areas. Any additional remedial actions, if necessary, would be described in a subsequent cleanup decision document, to be prepared in accordance with the 2007 Consent Order.

The monitoring activities would require the use of equipment such as trucks and possibly well-sampling equipment powered by generators. The equipment would use fuels (gasoline or diesel) and lubricants (oils and greases). Reasonably foreseeable spills and accident conditions involving the release of hazardous materials could occur, which could be an adverse impact to: (1) workers during cleanup activities, (2) the public and environment along offsite transportation routes, or (3) the environment both during and after cleanup activities.

As discussed above in the overall site cleanup, the existing materials handling regulations, and Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2 and TRANS-1 would ensure that fuel and lubricants are properly managed and transported to prevent or minimize releases, and that any spills that might occur are immediately cleaned up in a manner that minimizes adverse effects.

> Conclusion: Compliance with cleanup decision documents and Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1 would ensure that hazardous materials would be properly managed to prevent releases, and to immediately clean up any spills in the event of an accidental release. Therefore, impacts related to routine use or reasonably foreseeable upset and accident conditions involving hazardous materials for demolition activities and the post-closure permit renewals would be less than significant with mitigation incorporated.

Impact 4.7-2b Determination: *Implementation of the* ***initial activities*** *could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1 would reduce this impact. This impact would be* ***less than significant with mitigation.***

4.7.5.3 Hazardous Materials Near a School

Program Assessment

Impact 4.7-3a: Would the **overall site cleanup** emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Overall Site Cleanup (Impact 4.7-3a)

Although there are no schools or day care centers located within one-quarter mile of the project site, there are 14 schools or daycare centers located within one-quarter mile of one or more of the four proposed transportation routes that would be used by trucks hauling excavated soil from the project site and by trucks delivering materials to the site. Air quality impacts from truck traffic are analyzed in Section 4.2, *Air Quality*, of this PEIR. The long-term monitoring activities would not result in emitting or handling significant volumes of hazardous materials for any of the proposed cleanup activities and are therefore not analyzed further in this section because there would be no impact to existing or proposed schools along haul routes.

The proposed treatment methods include the excavation of soil with concentrations of chemicals and/or radionuclides above cleanup requirements and the transportation of the soil in trucks to offsite disposal facilities. Table 4.7-1 lists the chemicals and radionuclides used at SSFL. Other treatment methods include the use of chemical amendments to promote the treatment of chemicals; some of those chemical amendments are hazardous materials. These chemical amendments would be transported to the project site along one of four transportation routes shown in Figure 3-7. The proposed transportation routes to and from the project site would require the transportation of hazardous materials on public roadways and would pass within one-quarter mile of schools or day care centers. The transportation of hazardous materials along these routes could result in emissions of hazardous materials if not contained appropriately or through reasonably foreseeable upset and accident conditions that could expose the schools to adverse effects.

There are various federal, state, and local regulations that control the transportation of hazardous materials. Mitigation Measures HAZ-1, HAZ-2, HAZ-3, TRANS-1 would reduce and minimize the potential hazards to less than significant levels.

In addition, the packaging and transportation of soil impacted with chemicals and radionuclides is regulated by USDOT and the USNRC through specific requirements for the containerization and transport of hazardous and radioactive materials. The cleanup decision documents for the removal of soil with radionuclides would include routine monitoring of soil for radioactive levels. In the event that soils are discovered with radioactivity above the USDOT and USNRC standards, then the regulations incorporated into Mitigation Measure HAZ-2 would require that such materials would be packaged in accordance with regulations and transported by licensed radioactive materials haulers and disposed of at a licensed radioactive materials management facility. Mitigation Measure HAZ-5 limits the number of annual trucks trips carrying radioactive material.

Conclusion: The overall site cleanup would comply with the cleanup decision documents, Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HAZ-5, and TRANS-1 and USDOT and USNRC regulations for the transportation of hazardous waste and radioactive materials, to mitigate the potential emission of hazardous emissions or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. Therefore, impacts related to emissions within one-quarter mile of a school would be less than significant with mitigation incorporated.

Impact 4.7-3a Determination: *The* ***overall site cleanup*** *would emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school or day care center. Implementation of Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HAZ-5, and TRANS-1 would mitigate this impact. This impact would be* ***less than significant with mitigation incorporated****.*

Initial Project Assessment

Impact 4.7-3b: Would the **initial activities** emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Initial Activities (Impact 4.7-3b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

With the exception of the post-closure maintenance activities, the initial activities described in Section 3.7 would involve soil excavation and disposal, and building demolition, in certain portions of all four administrative areas. As explained in the overall site cleanup discussion (Impact 4.7-3a), all of the proposed initial activities would be subject to the same packaging and transportation requirements, incorporated into Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HAZ-5, and TRANS-1 designed to reduce and minimize the potential hazards to less than significant levels.

Conclusion: As explained in the overall site cleanup discussion, compliance with the cleanup decision documents, Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HAZ-5, and TRANS-1 and USDOT and USNRC regulations for the transportation of hazardous waste and radioactive materials, would mitigate the potential emission of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. Therefore, impacts related to emissions within one-quarter mile of a school would be less than significant with mitigation incorporated.

Impact 4.7-3b Determination: *The **initial activities** would emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school or day care center.*[11] *Implementation of Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HAZ-5, and TRANS-1 would mitigate this impact. This impact would be **less than significant with mitigation incorporated.***

4.7.5.4 Interfere with Emergency Response Plan

Program Assessment

Impact 4.7-4a: Would implementation of the **overall site cleanup** impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Overall Site Cleanup (Impact 4.7-4a)

Site cleanup would involve a substantial number of vehicles using local roadways and has the potential to interfere with emergency evacuation routes.

Long-term monitoring activities would not require a significant quantity of vehicles, and no roads would be closed or restricted. This PEIR does not consider future development of the site, such as residential use, and thus a long-term emergency evacuation plan would not be needed. Therefore, impacts affecting designated emergency routes are not analyzed further in this section.

The proposed cleanup methods include the excavation and hauling to an offsite disposal facility. Other methods include the use of equipment and chemical amendments transported to and from the project site. In addition, monitoring activities would require the transportation of workers and equipment to and from the site. Overall site cleanup activities would increase traffic on project truck routes, as discussed in Section 4.11, *Transportation and Traffic*, of this PEIR. As discussed in Section 4.7.1.4, the Los Angeles County Department of Public Works provides local area maps showing designated emergency routes. Specific segments of Valley Circle Boulevard, which would be accessed by all four proposed roadways, are part of a designated Secondary Disaster Route; part of Roscoe Boulevard also is a designated Secondary Disaster Route. US 101, SR 218, and SR 27 (Topanga Canyon Boulevard) are designated Primary Disaster Routes. The increased

[11] Air quality impacts from truck traffic along proposed transportation routes are analyzed in Section 4.2, *Air Quality*, of this PEIR.

truck traffic on these roads could interfere with emergency evacuation routes as trucks may move somewhat slower than passenger vehicles and are less maneuverable.

As discussed in Section 3.6.1, *Soil Remediation*, of this PEIR, most site activities would occur five days per week (Monday through Friday), eleven hours per day, and during daylight hours (7:00 a.m. to 6:00 p.m.). Project activities would result in a daily maximum of up to 96 trucks visiting the site (resulting in 192 one-way truck trips) for all RPs combined. As discussed in Section 4.11, *Transportation and Traffic*, of this PEIR, project-related activities have the potential to worsen the existing LOS from LOS E to LOS F for one roadway segment that is part of designated Secondary Disaster Route (i.e., Valley Circle Boulevard between Box Canyon Road and Woolsey Canyon Road). However, as discussed in Section 4.11, *Transportation and Traffic*, of this PEIR, under Impact 4.11-3a, with implementation of Mitigation Measure TRANS-1, truck trips would be limited to off-peak traffic hours, when traffic levels on these roads are lower, and would also require the use of onsite borrow pits and the same trucks for haling backfill and removing contaminated soil, which would reduce truck trips on public roadways. As such, project-related traffic would not interfere with evacuation routes.

Additionally, to ensure vehicular safety at the entrance and exit points of the site, as well as for offsite transport to and from the project site, Mitigation Measure TRANS-1 would require the RPs to prepare and implement a comprehensive Traffic Management Plan for DTSC review, which would include a traffic control plan, parking plan, traffic operations, truck safety plan, hazardous materials transport plan, and ridesharing plan that would be updated to include the initial activities.

> Conclusion: Compliance with Mitigation Measure TRANS-1, which would limit truck trips to off-peak hours and limit the maximum number of trucks on area roadways to 96 trucks per day, would ensure that the project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, this impact would be less than significant with mitigation incorporated.

Impact 4.7-4a Determination: *The* ***overall site cleanup*** *could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Implementation of Mitigation Measure TRANS-1 would mitigate this impact. This impact would be* ***less than significant with mitigation incorporated.***

Initial Project Assessment

Impact 4.7-4b: Would implementation of the **initial activities** impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Initial Activities (Impact 4.7-4b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The initial activities would result in a daily maximum of up to 96 trucks visiting the site (resulting in 192 one-way trucks trips) for all RPs combined. The increased truck traffic on designated Primary and Secondary Disaster Routes could interfere with emergency evacuation routes as trucks may move somewhat slower than passenger vehicles and are less maneuverable. As discussed in Section 4.11, *Transportation and Traffic*, of this PEIR, the initial activities have the potential to worsen the existing LOS from LOS E to LOS F on Valley Circle Boulevard between Box Canyon Road and Woolsey Canyon Road, a designated Secondary Disaster Route. However, as discussed in Section 4.11, *Transportation and Traffic*, under Impact 4.11-3b, with implementation of Mitigation Measure TRANS-1, truck trips would be limited to off-peak traffic hours, when traffic levels on these roads are lower, which would prevent restriction of public roads and exceedance of roadway carrying capacity. As such, project-related traffic would not interfere with evacuation routes.

Additionally, to ensure vehicular safety at the entrance and exit points of the site, as well as for offsite transport to and from the project site, Mitigation Measure TRANS-1 would require implementation of a Traffic Management Plan for DTSC review and approval, which would include a traffic control plan, parking plan, traffic operations, truck safety plan, hazardous materials transport plan, and ridesharing plan that would be updated to include the initial activities.

> Conclusion: Compliance with Mitigation Measure TRANS-1, which would limit truck trips to off-peak hours, require use of onsite borrow pits as a source of backfill, and limit the maximum number of trucks on area roadways to 96 trucks per day, would ensure that the project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, impacts would be less than significant with mitigation incorporated.

Impact 4.7-4b Determination: *The* ***initial activities*** *could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Implementation of Mitigation Measure TRANS-1 would mitigate this impact. This impact would be* ***less than significant with mitigation incorporated.***

4.7.5.5 Wildfire Risk

Program Assessment

Impact 4.7-5a: Would implementation of the **overall site cleanup** expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Overall Site Cleanup (Impact 4.7-5a)

Implementation of the overall site cleanup would occur within an area with a known very high FHSZ area. Therefore, this criterion is evaluated in the following pages.

The overall site cleanup is in an area that the State has designated as a very high FHSZ area. The proposed cleanup would include the use of equipment such as trucks for carrying workers and equipment that could spark fires from hot components, such as catalytic converters and/or mufflers, if driven in grassy off-road areas. In addition, some treatment methods would use chemicals that are flammable, such as hydrogen, propane gas, or oxidizers. These potential ignition sources and fuels could result in wildfires. Mitigation Measure HAZ-4 requires the preparation of a Fire Management Plan that would establish procedures to prevent and control fires. With implementation of Mitigation Measure HAZ-4, the project's contribution to wildfire risk would be less than significant.

Although many of the areas requiring cleanup are in areas that are paved or disturbed with minimal vegetation, some of the cleanup areas extend to off-road areas and the equipment may need to move through areas with brush or grass to gain access to the treatment area. Consequently, the potential exists for sparks to ignite wildfires. However, as discussed in Section 4.7.1, California Vehicle Code Section 38366 requires spark-arresting equipment on vehicles that travel off-road. This code applies to the project, because vehicles that work in off-road areas would be required to have spark-arresting equipment to reduce the risk of wildfires.

Some of the soil and groundwater treatment methods would require use of chemicals that are flammable. For example, the gaseous electron donor injection technology injects hydrogen or propane gas for perchlorate treatment and in situ chemical oxidation requires the use of strong oxidizers. Both gases are flammable and the presence of a spark could ignite the gases and start a wildfire if located near brushy or grassy areas. The improper use of these flammable gases in the presence of a spark could ignite a wildfire. However, the Health and Safety Plan required by Mitigation Measure HAZ-1, Hazardous Materials Business Plan required by Mitigation Measure HAZ-3), and Fire Management Plan required by Mitigation Measure HAZ-4, would describe the required procedures to prevent and control fires and requirements for the proper storage and handling for these flammable gases, as well as flammable fuels and other chemicals.

Once cleanup activities have been completed, project-related transportation would be limited to long-term maintenance and monitoring activities, such as the inspection of caps, and the collection of water levels and water samples from monitoring wells. These activities would

generally occur on a quarterly basis (5 to 10 days per quarter [90 days]) and would require the use of one or two trucks. The trucks would use the established access roads and would not need to travel through off-road locations in areas where grass or brush fires could start. The Fire Management Plan required by Mitigation Measure HAZ-4 would also be implemented during the maintenance and monitoring phase.

> Conclusion: Compliance with existing federal, state, and local regulations and Mitigation Measures HAZ-1, HAZ-3, and HAZ-4 would ensure that people or structures would not be exposed to a significant risk of loss, injury or death involving wildland fires. Therefore, impacts related to wildfires as a result of the overall site cleanup activities would be less than significant with mitigation incorporated.

Impact 4.7-5a Determination: *The proposed* ***overall site cleanup*** *could expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. Implementation of Mitigation Measures HAZ-1, HAZ-3, and HAZ-4 would mitigate this impact. This impact would be* ***less than significant with mitigation incorporated.***

Initial Project Assessment

Impact 4.7-5b: Would implementation of the **initial activities** expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Initial Activities (Impact 4.7-5b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

As discussed in Section 3.7 *Initial Activities,* the RPs would implement the initial activities upon approval of the PEIR. All of these projects are either in areas with the same wildfire potential as explained in the overall site cleanup discussion (Impact 4.7-5a) or would be conducted in developed areas and across established roads with no potential to start wildfires. California Vehicle Code Section 38366 requires spark-arresting equipment on vehicles that travel off-road.

The Fire Management Plan required by Mitigation Measure HAZ-4, Health and Safety Plan required by Mitigation Measure HAZ-1, and the Hazardous Materials Business Plan required by Mitigation Measure HAZ-3, would describe the required procedures to prevent and control fires and requirements for the proper storage and handling for flammable gases, as well as flammable fuels and other chemicals.

Conclusion: Compliance with existing federal, state, and local regulations and Mitigation Measures HAZ-1, HAZ-3, and HAZ-4 would ensure that people or facilities would not be exposed to a significant risk of loss, injury or death involving wildland fires. Therefore, impacts related to wildfires as a result of the overall site cleanup activities would be less than significant with mitigation incorporated.

Impact 4.7-5b Determination: *The proposed* ***initial activities*** *could expose people or facilities to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. Implementation of Mitigation Measures HAZ-1, HAZ-3, and HAZ-4 would mitigate this impact. This impact would be* ***less than significant with mitigation incorporated.***

4.7.5.6 Use of Chemical Amendments

Program Assessment

Impact 4.7-6a: Would implementation of the **overall site cleanup** create a significant hazard to the public or the environment through the presence of chemical amendments for the treatment of chemicals in soil and/or groundwater?

Overall Site Cleanup (Impact 4.7-6a)

As part of the proposed remediation efforts, the use of chemical amendments would be necessary for certain soil and groundwater treatment technologies (e.g., bioventing, land farming, and in situ chemical oxidation, in situ enhanced biological treatment, and passive seep treatment) to facilitate cleanup of soil and groundwater. For example, the implementation of in situ chemical oxidation to destroy chemicals in groundwater would include the injection of strong oxidizing agents, such as potassium permanganate. Potassium permanganate has acute and chronic health hazards[12] (ScienceLab, 2013). These chemical agents would be purposely placed into and left in the subsurface environment as a part of the treatment technology, but they can create adverse effects if not managed appropriately.

The proposed remediation activities for certain treatment technologies would include the use or addition of certain chemical amendments to facilitate cleanup. Figures 3-6 and 3-8 show the areas

[12] This substance would be hazardous in case of skin and eye contact (irritant), ingestion, or inhalation (ScienceLab, 2013). The amount of tissue damage depends on length of contact. Prolonged exposure may result in skin burns and ulcerations. Over-exposure by inhalation may cause respiratory irritation. Severe over-exposure can produce lung damage, choking, unconsciousness, or death. No known carcinogenic effects. The substance may be toxic to kidneys, liver, skin, central nervous system.

where soil and groundwater, respectively, exceed cleanup requirements. **Table 4.7-9** summarizes the soil and groundwater treatment technologies and the required treatment chemicals, if any.

TABLE 4.7-9
TREATMENT TECHNOLOGY CHEMICAL USE

Treatment Technology	Chemicals
Soil Treatment Methods	
Excavation and offsite disposal	None
Soil vapor extraction	None
Bioventing and gaseous electron donor injection technology	Hydrogen or propane gas for perchlorate treatment
Ex situ biopiles and land farming	Methyl soyate, calcium magnesium acetate, or food grade citric acid
Monitored natural attenuation	None
Phytoremediation	None
Soil washing/partitioning	Detergents
Soil solidification/stabilization	Cement compounds
Thermal Desorption	None
Capping	None
Groundwater Treatment Methods	
Pump and treat	None
Air sparging and vapor extraction	None
Thermal enhanced vapor extraction	None
In situ chemical oxidation	Oxidizing agents, such as ozone, peroxide, persulfate, or permanganate.
In situ enhanced biological treatment	Nutrients such as nitrogen or phosphorus
MNA and institutional controls	None
Passive treatment at seeps	Zero-valent iron or granular activated carbon
Bedrock Removal (for Strontium 90)	None

SOURCES: DOD, 2010; DOE, 2014; MWH, 2013; NASA, 2013.

Impacts from hazards caused by the routine use of or from reasonably foreseeable upset and accident conditions (e.g., spillage of excavated soil, chemical amendments being transported to the site, or equipment fuel, oil and lubricants, solvents, paints) are evaluated under Impact 4.7-1 and Impact 4.7-2.

As noted above, some of the treatment technologies would require the addition of chemicals, some of which are classified as toxic, ignitable, corrosive, or reactive. The cleanup decision documents for Boeing, NASA, and DOE would be prepared by each of the RPs prior to implementing any of the cleanup activities and would be approved by DTSC prior to implementation. The cleanup decision documents would describe the remedial activities that require the chemical amendment procedures, detail the volume of chemical amendments to be added, and summarize the anticipated results of their use. The volume of chemical amendments

added would be only as much as necessary to treat the previously defined affected area. The end result of these remediation technologies is purposely designed such that the addition of these chemical amendments results in the formation of innocuous nontoxic end components.

When the chemical amendments are initially injected into the subsurface (e.g., permanganate for in situ chemical oxidation) or added to surface treatment units (e.g., methyl soyate for biopiles), and until the chemical reactions reach completion, the chemicals amendments would be present in their pre-reaction form. If not managed appropriately, they could result in adverse impacts on the environment into which the chemical amendments are placed.

The hydrogen or propane that would be injected into the subsurface to treat perchlorate is flammable gas that could ignite, injuring workers or damaging the local environment, and possibly starting a wildfire. As noted in Section 4.7.1.6, *Potential for Wildfires*, the project site is in an area considered to be in a very high FHSZ. However, the cleanup decision documents, as approved by DTSC, and the associated waste discharge requirements (WDR), as approved by the LARWQCB, would describe the target depths of injection and would describe the rate of injection that would ensure the hydrogen or propane gases are injected at concentrations low enough to prevent ignition while high enough to promote degradation of the perchlorate to be treated. In addition, the injection process would not include the use of equipment that could induce sparks. Finally, hydrogen is a naturally occurring element and propane is a relatively simple organic compound composed of carbon and hydrogen that would biodegrade over time. However, with the project located within a very high FHSZ, the risk for fire hazards exists. Thus, Mitigation Measure HAZ-4 requires preparation of a Fire Management Plan that would establish procedures to prevent and control fires (see Section 4.7.5.5 for an analysis of wildfire risk). With implementation of Mitigation Measure HAZ-4, fire hazard impacts would be less than significant.

The chemical amendments that would be used in biopiles or land farming[13] include chemical amendments such as methyl soyate, calcium magnesium acetate, and/or food grade citric acid. Methyl soyate is a nonsoluble biodiesel fuel. While the methyl soyate diesel fuel is flammable, the relative flammability is low compared to gasoline, and is relatively safe to handle. In addition, methyl soyate is a relatively simple organic compound, composed of hydrogen, carbon, and oxygen; consequently, it does naturally biodegrade and, in this case, would be purposely added to the soil to promote the microbial activity that would treat the chemicals to be cleaned up. Calcium magnesium acetate is soluble in water and would be used to assist in delivering the methyl soyate to the areas where chemicals are to be treated. Calcium magnesium acetate is considered to be nonhazardous, nonflammable, and biodegradable (Peters Chemical Company, 2006). Food-grade citric acid is manufactured for use in food preparation (Brenntag, 2014). Therefore, none of these chemical amendments would result in hazards, and they would purposely promote the degradation of the site-related chemicals being treated.

[13] Biopiles and land farming generally refers to ex situ, onsite treatment methods where contaminated soils are aerated and mixed with soil amendments to facilitate breakdown, or treatment, of contaminants. Additional details are presented in Section 3.6.

Soil washing would use detergents to wash the soil to be treated and separate the materials with chemical concentrations above cleanup requirements. The separation can occur in two ways: (1) the detergents can wash the chemicals to be treated into the wash solution, which is then treated or properly disposed of, or (2) the detergents can separate the silt and clay particles from the sand and gravel; the chemicals to be treated tend to adhere to the smaller silt and clay particles, while the sand and gravel tend to not have chemical concentrations above cleanup requirements. Upon completion, the wash solution would be tested for the chemicals to be treated. The wash solution would then be treated or disposed of at an offsite disposal facility, depending on the chemical concentrations. Only toxic and non-biodegradable detergents would be considered a hazardous material.

Enhanced groundwater treatment for the cleanup of chlorinated hydrocarbons, such as TCE, would inject an oxidizing agent, such as ozone, peroxide, persulfate, or permanganate into groundwater in the areas shown in Figure 3-8. The oxidation process breaks down the perchlorate into innocuous nontoxic compounds. The ozone would be injected as a gas. The peroxide, persulfate, or permanganate would be injected as a liquid. All are strong oxidizing agents that would be considered potential dermal, inhalation, and ingestion hazards. However, these chemicals would be injected into the subsurface at depth and would be inaccessible to the public and biota at the surface. The injection would purposely promote the degradation of the site-related chemicals being treated and the end products would be nontoxic end products.

The nutrients that would be used to promote microbial activity and cleanup of chemicals would not be hazardous in and of themselves. The nutrients can be compared to the essential components of fertilizers and would not be considered hazardous.

The zero valent iron or granular activated carbon that would be installed at the seeps shown in Figure 3-8 are not hazardous materials in and of themselves. In addition, the materials would be buried and not accessible to people and wildlife.

As discussed above, upon completion of treatment, the chemical amendments added to onsite media would be reduced to innocuous nontoxic end components as they are designed to do. Mitigation Measure HYDRO-2 describes the O&M Plan that includes monitoring for both chemicals to be treated and chemicals amendments added to promote treatment, which would also be enforceable under waste discharge requirements determined by the LARWQCB. In addition, Mitigation Measure HYDRO-1 would require implementation of a LARWQCB-approved stormwater pollution prevention plan (SWPPP) that would include BMPs for spill prevention and control. Long-term monitoring of soil or groundwater would not include the use of any chemical amendments or other hazardous materials.

> Conclusion: Compliance with cleanup decision documents and Mitigation Measures HAZ-4, HYDRO-1, and HYDRO-2 would ensure that chemical amendments would not create a significant hazard to the public or the environment through the presence of chemical amendments for the treatment of chemicals in soil and/or groundwater. Therefore, impacts related to the use of chemical amendments would be less than significant with mitigation incorporated. In addition, implementation of waste discharge

requirements, enforceable under the LARWQCB permitting process, would further reduce the potential for impacts from the use of chemical amendments.

Impact 4.7-6a Determination: *The* ***overall site cleanup*** *could create a significant hazard from the use of chemical amendments. Implementation of Mitigation Measures HAZ-4, HYDRO-1, and HYDRO-2 would mitigate this impact. This impact would be* ***less than significant with mitigation incorporated.***

Initial Project Assessment

Impact 4.7-6b: Would implementation of the **initial activities** could create a significant hazard to the public or the environment through the presence of chemical amendments for the treatment of chemicals in soil and/or groundwater?

Initial Activities (Impact 4.7-6b)

As discussed in Section 3.7, *Initial Activities*, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The initial activities described in Section 3.7 would involve soil excavation and disposal, building demolition, and maintenance activities in certain portions of all four administrative areas. The proposed initial activities would not require the use of chemical amendments, nutrients, or treatment gases. Therefore, there would be no impact relative to the use of added chemical amendments. Impacts associated with the use of equipment fuels, oils, and lubricants are discussed in Impact 4.7-2.

Conclusion: The initial activities would not use chemical amendments. Therefore, there would be no impact from the use of chemical amendments, nutrients, or treatment gases.

Impact 4.7-6b Determination: *The* ***initial activities*** *would not create a significant hazard from the use of chemical amendments. This would result in* ***no impact****. No mitigation would be required.*

4.7.5.7 Location on a Hazardous Materials Site

Program Assessment

Impact 4.7-7a: Would implementation of the **overall site cleanup** be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment?

Overall Site Cleanup (Impact 4.7-7a)

The project site has been identified by DTSC and CalEPA as a contaminated site. The overall site cleanup would clean up the project site and would not involve construction of residences, businesses, or other uses that would place people at the project site. As discussed under Impact 4.7-1a, cleanup of the site would potentially result in a significant impact with respect to the transport of hazardous materials, however, this impact will be mitigated to less than significant. Also, as discussed under Impact 4.7-2a, the overall site cleanup would result in a significant and unavoidable impact with respect to reasonably foreseeable upset and accident conditions. The overall site cleanup would result in a less-than-significant impact with mitigation incorporated with respect to the transport of hazardous material near a school as discussed under Impact 4.7-3a. Therefore, the overall site cleanup would result in significant and unavoidable impacts as a result of the project's location at a hazardous materials site and consequent risks of reasonably foreseeable upset and accident conditions (see Impact 4.7-2a).

Conclusion: The overall site cleanup would result in significant and unavoidable impacts as a result of the project's location at a hazardous materials site with the potential to create significant hazard to the public. The mitigation measures identified for Impacts 4.7-1a, 2a and 3a would also be applicable to Impact 4.7-7a. These Mitigation Measures include HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1. However, this impact would remain significant and unavoidable.

Impact 4.7-7a Determination: *The* ***overall site cleanup*** *would be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, could create a significant hazard to the public or the environment. Implementation of Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1 would reduce this impact. However, this impact would be* ***significant and unavoidable.***

Initial Project Assessment

Impact 4.7-7b: Would implementation of the **initial activities** be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment?

Initial Activities (Impact 4.7-7b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The project site has been identified by DTSC and CalEPA as a contaminated site. The initial activities would clean up the project site and would not involve construction of residences, businesses, or other uses that would place people at the project site. As discussed under Impact 4.7-1b, implementation of the initial activities would result in a significant impact with respect to the transport and disposal of hazardous materials, however, this impact would be less than significant with mitigation. As discussed under Impact 4.7-2b, the initial activities would result in a less-than-significant impact with mitigation incorporated with respect to reasonably foreseeable upset and accident conditions. The initial activities would also result in a less-than-significant impact with mitigation incorporated with respect to the transport of hazardous material near a school as discussed under Impact 4.7-3b.

Therefore, the initial activities would not result in a significant impact with mitigation.

> Conclusion: The initial activities would result in significant impacts as a result of the project's location at a hazardous materials site. The mitigation measures identified for Impacts 4.7-1b, 4.7-2b, and 4.7-3b would also be applicable to Impact 4.7-7b. These Mitigation Measures include HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1. Impacts from the initial activities would be less than significant with implementation of these mitigation measures.

Impact 4.7-7b Determination: *The* ***initial activities*** *would be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, could create a significant hazard to the public or the environment. Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, TRANS-1 would reduce this impact. This impact would be* ***less than significant with mitigation.***

4.7.6 Mitigation Measures

The following measures shall be implemented to mitigate impacts related to hazards and hazardous materials:

HYDRO-1: Stormwater Pollution Prevention Program (SWPPP) (see Section 4.8.6 for details).

HYDRO-2: Operations and Maintenance Plan (O&M) (see Section 4.8.6 for details).

TRANS-1: Traffic Management Plan (see Section 4.11.6 for details).

HAZ-1: Health and Safety Plan. A Health and Safety Plan (HSP) shall be developed and implemented for the proposed activities and will include the following:

- General hazard controls
- Monitoring requirements
- Project-specific hazard controls such as asbestos, lead-based paint, and earthmoving equipment
- Traffic control
- Physical hazard controls such as noise and temperature extremes
- Biological hazard controls

Designated areas for chemical storage and handling shall be identified. The plan shall be reviewed for the project activities and shall include procedures to mitigate potential hazards, measures that provide protection from physical hazards, measures that provide protection from chemical hazards that might be present at the site, decontamination procedures, and worker and health and safety monitoring criteria to be implemented during project activities, if needed. Per 29 CFR Part 1910, Hazardous Waste Operations and Emergency Response Standard, safety training for site workers must be met in order to conduct cleanup or emergency response operations. Associated worker safety training shall occur before ground-disturbing activities began. Work zones shall be marked clearly with barricades or construction fencing to control unauthorized access to the areas. In addition, if dust or chemical monitoring is required during demolition or during soil and groundwater cleanup operations, it shall be implemented according to the site-specific HSP, which will list the proper action limits at which controls shall be required.

HAZ-2: Hazardous Materials Containment. To ensure appropriate containment of excavated materials that exceed state or federal hazardous waste criteria, such materials shall be placed in lined, sealed containers or wrapped and enclosed by tarps and transported by licensed hazardous waste haulers and disposed of at a licensed hazardous waste management facilities approved for the specific hazardous materials to be disposed of.

HAZ-3: Hazardous Materials Business Plan. As required by California Health and Safety Code Chapter 6.95 and the California Code of Regulations, Title 19, a Hazardous Materials Business Plan shall be developed by each RP, under the direction of DTSC. These plans shall describe appropriate storage, containment, and safety protocols for use

of hazardous materials during the remediation; emergency procedures to be followed in the event of a release; instructions for performing fueling and maintenance operations on vehicles and equipment onsite; and other protocols so that hazardous materials shall be stored and handled appropriately.

HAZ-4: Fire Management Plan. A Fire Management Plan shall be prepared for proposed cleanup, demolition, soil and debris hauling, monitoring, and maintenance activities located at the project site and along proposed haul routes in High Fire Severity Zones. The plan shall include but not be limited to the following:

- The name and contact information of a Fire Control Coordinator who shall be assigned to the project.
- A list of numbers to call in case of a fire, including 911 (or the equivalent in the area).
- Alternative communication methods for areas of the site that do not have reliable cellular phone service.
- A complete list, including storage locations, of all tools and equipment the Contractor will use in the event of a fire within project limits.
- Methods that shall be employed if a fire is encountered or started during activities within the project limits.
- Specific fire prevention precautions, and the required firefighting equipment, for activities that have the potential for starting a fire. At a minimum, the plan shall address prevention planning related to use of heavy equipment, vehicles, flammable chemicals and gases, hand tools, storage, and parking areas.
- Provisions for field safety meetings. The Contractor shall conduct field safety meetings (also known as toolbox or tailgate meetings) daily. The Contractor shall require participation by all persons working at the project site. Participants shall discuss specific fire prevention precautions for construction activities.
- All provisions of the plan shall be applicable to cleanup crews and activities and monitoring/maintenance crews and activities.

HAZ-5: Transport of Radiological Material. To limit radioactive exposure to sensitive uses, the number of annual truck trips transporting low-level radioactive waste (LLRW) and mixed low-level radioactive waste (MLLRW) would be limited to 2,080 trips on an annual basis or an average of eight trucks per day.

4.7.7 Impact Summary

Table 4.7-10 summarizes project impacts and significance determinations related to hazards and hazardous materials.

TABLE 4.7-10
SUMMARY OF IMPACTS – HAZARDS AND HAZARDOUS MATERIALS

Impacts	Overall Project	DOE Initial Project	NASA Initial Project	DOE Demolition Activities	RCRA Post-Closure Facility Closure	Mitigation Measures
Impact 4.7-1a: Transport, disposal, and use of hazardous materials	LSM	--	--	--	--	TRANS-1, HAZ-2, HAZ-5
Impact 4.7-1b: Transport, disposal, and use of hazardous materials	--	LSM	LSM	LSM	LSM	TRANS-1, HAZ-2, HAZ-5
Impact 4.7-2a: Reasonably foreseeable upset and accident conditions	S&U	--	--	--	--	HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, TRANS-1
Impact 4.7-2b: Reasonably foreseeable upset and accident conditions	--	LSM	LSM	LSM	LSM	HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, TRANS-1
Impact 4.7-3a: Hazardous materials near a school	LSM	--	--	--	--	HAZ-1, HAZ-2, HAZ-3, HAZ-5, TRANS-1
Impact 4.7-3b: Hazardous materials near a school	--	LSM	LSM	LSM	LSM	HAZ-1, HAZ-2, HAZ-3, HAZ-5, TRANS-1
Impact 4.7-4a: Interfere with emergency response plan	LSM	--	--	--	--	TRANS-1
Impact 4.7-4b: Interfere with emergency response plan	--	LSM	LSM	LSM	LSM	TRANS-1
Impact 4.7-5a: Wildfire risk	LSM	--	--	--	--	HAZ-1, HAZ-3, HAZ-4
Impact 4.7-5b: Wildfire risk	--	LSM	LSM	LSM	LSM	HAZ-1, HAZ-3, HAZ-4
Impact 4.7-6a: Use of chemical amendments	LSM	--	--	--	--	HAZ-1, HYDRO-1, HYDRO-2
Impact 4.7-6b: Use of chemical amendments	--	NI	NI	NI	NI	None
Impact 4.7-7a: Located on a hazardous materials site	S&U	--	--	--	--	HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, TRANS-1
Impact 4.7-7b: Located on a hazardous materials site	--	LSM	LSM	LSM	LSM	HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, TRANS-1

S&U = Significant and unavoidable
LSM = Less than significant with mitigation incorporated

4.8 Hydrology and Water Quality

This section analyzes the overall site cleanup and initial activities potential impacts associated with hydrology and water quality. The existing hydrological setting is provided along with the relevant regulatory background. Project impacts and mitigation measures, as necessary, are also presented and discussed.

4.8.1 Environmental Setting

4.8.1.1 Existing Conditions

Climate

The project area includes unincorporated areas of the southeastern-most part of Ventura County, adjacent to Los Angeles County. The climate in the project area is generally characterized as a Mediterranean-type climate that experiences relatively low annual rainfalls. Monthly mean temperatures range from 50 ºF during winter months to 70 ºF during summer months (SAIC, 1994, as cited in MWH, 2009a). During the summer months (April through October), wind patterns are predominantly landward because of the site's proximity to the Pacific Ocean, whereas during the winter months, patterns are interrupted by weather fronts. Based on wind measurements collected at the project site in Area IV from 1994 through 1997, the prevailing wind pattern is northwest-southeast (MWH, 2009a). The pattern is consistent with historical data collected in both the 1960s and 1990s.

Precipitation has been measured daily since 1960 at the project site at two onsite stations. Precipitation is normally in the form of rain, although snow has occasionally fallen during winter months. Precipitation at the site has generally averaged approximately 18 inches per year, ranging between a low of 6.15 inches and a maximum of 41.24 inches for data through 2014 (MWH, 2015). The majority of annual precipitation at the site and surrounding area occurs between the months of November and March, consistent with the regional precipitation pattern of southern California.

Surface Water Features and Drainages

Surface Waters

A number of surface water drainages run through the hilly project site, as shown in **Figure 4.8-1**, these have been divided into four drainage areas: Northwestern Drainage, Northern Drainage, Happy Valley Drainage, and Bell Creek Drainage (also referred to as the Southern Drainage). Most of the surface water flows in these drainages are ephemeral.

The majority of the surface water (estimated at approximately 60 percent) exits the site through the southern property boundary into Bell Creek, which then discharges into the Los Angeles River. Historically, surface water flow in the Bell Creek Drainage included stormwater runoff, operational discharges, treated sanitary waste water, and treated groundwater, in accordance with the NPDES permit.

Most of the eastern portion of the project site drains through Dayton Canyon into Dayton Creek and combines with Bell Creek downstream before joining the Los Angeles River. The northwestern perimeter of the site drains northward into Meier Canyon, which subsequently discharges into Arroyo Simi. Arroyo Simi is part of the Calleguas Creek Watershed, which drains westward toward the Pacific Ocean at Mugu Lagoon. The Northern Drainage connects to the Meier Canyon Drainage north of the project site on the Brandeis-Bardin property. A small portion of the site also drains to the northeast through Woolsey Canyon and a very small area in the northwest portion of the site drains through Runkle Canyon.

National Pollutant Discharge Elimination System Monitoring Locations

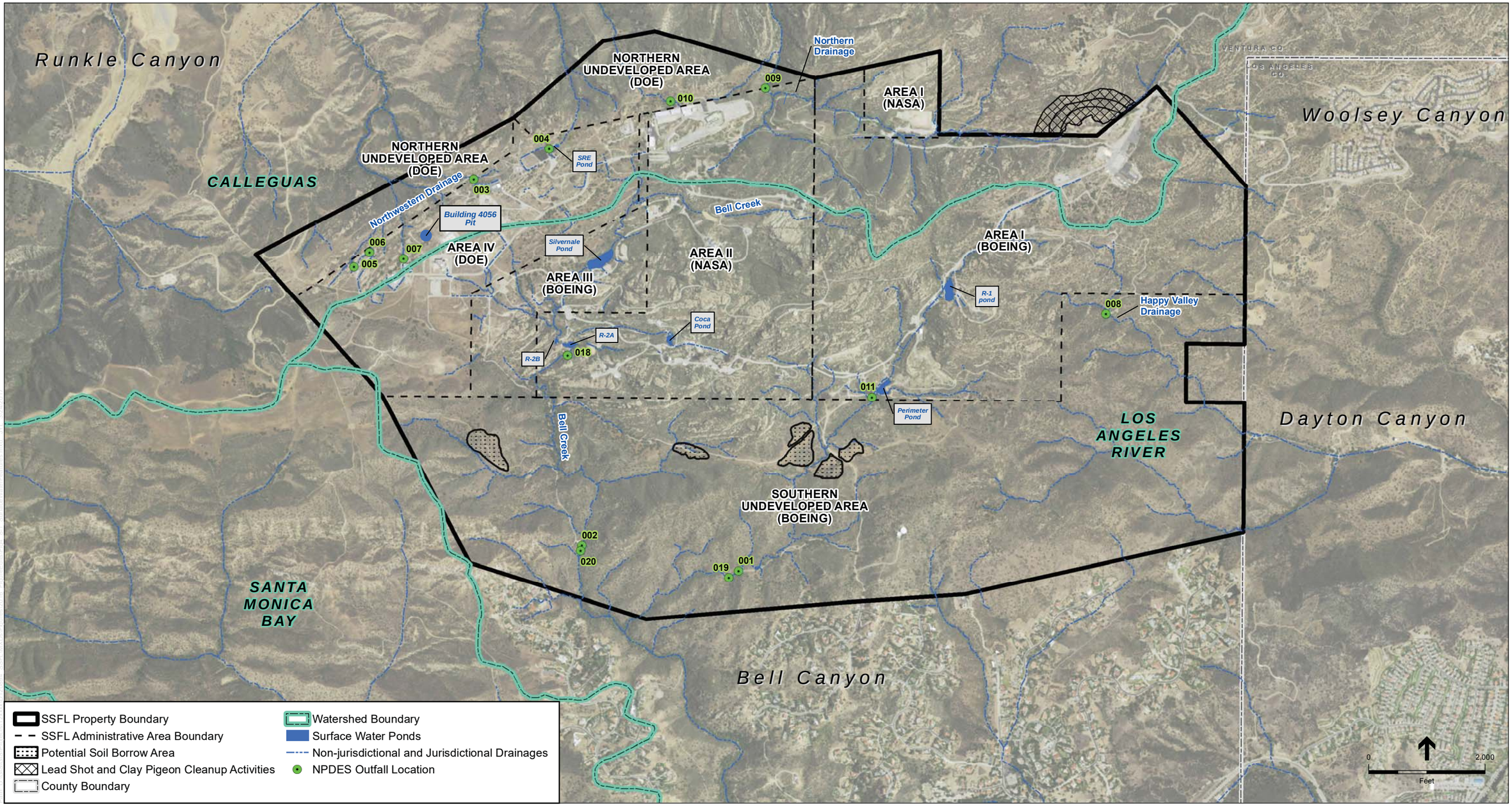
A NPDES permit was first issued to regulate discharges from site activities in 1976, with the most recent NPDES permit issued in 2015 for the discharge of stormwater and treated groundwater (LARWQCB, 2015). In 1989, USEPA conducted an investigation on environmental issues at the project site. In response to the findings of the investigation, a surface water monitoring program, initially targeting the northwest slope areas, was implemented. USEPA recommended that the LARWQCB ensure that runoff from the northwest side of Area IV did not contain contaminants released from SSFL activities in accordance with the Clean Water Act. As a result, the project site is monitored under the NPDES program, which, as originally issued, authorized discharges of stormwater, along with stormwater mixed with wastewater, and wastewater (LARWQCB Order R4-2009-0058 adopted by the LARWQCB on May 8, 2009 [NPDES Permit No. CA0001309]). **Table 4.8-1** summarizes current and former permitted outfalls. The current outfall locations are shown on Figure 4.8-1. Operations at the project site have changed over the years. All current outfalls discharge stormwater with the exception of Outfalls 019 and proposed Outfall 020 which are permitted for the discharge of treated groundwater.

NPDES Outfalls 001, 002, 011, and 018 monitor discharges of stormwater going to Bell Creek. Outfall 008 monitors stormwater discharges going to Dayton Canyon.

Surface water discharges from the northwestern portion of the site that drain into Meier Canyon are monitored at Stormwater upstream of NPDES Outfalls 003, 004, 005, 006, 007, and 010. Currently, stormwater upstream upstream of these outfalls is typically routed for storage and treatment at the Silvernale Pond, and subsequently discharge at NPDES Outfall 018; stormwater that is not routed to Silvernale Pond is discharged to Arroyo Simi. Stormwater from the northeastern and north-central portions of the project site drain into the Northern Drainage and is monitored at NPDES Outfall 009.

NPDES Outfall 019 and proposed Outfall 020 could be used to discharge treated groundwater from the GETS.

In addition, grab water samples have been collected from the Arroyo Simi at Frontier Park (referred to as RSW-002) to evaluate the potential contribution of SSFL operations to the identification of bacteria in Arroyo Simi (Boeing, 2012).



SOURCE: ESA; ESRI; Boeing 2015

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Figure 4.8-1

Surface Water Features

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TABLE 4.8-1
CURRENT AND FORMER NPDES OUTFALLS

NPDES Outfall Number	Description	Drainage Area/ Receiving Waters
001	Stormwater, South Slope	Bell Creek/Bell Canyon
002	Stormwater, South Slope	Bell Creek/Bell Canyon
003	Stormwater, Radioactive Materials Handling Facility	Northwestern/Meier Canyon
004	Stormwater, Sodium Reactor Experiment Area	Northwestern/Meier Canyon
005	Stormwater, Upper Former Sodium Disposal Facility	Northwestern/Meier Canyon
006	Stormwater, Lower Former Sodium Disposal Facility	Northwestern/Meier Canyon
007	Stormwater, Building 100	Northwestern/Meier Canyon
008	Stormwater, Happy Valley	Dayton Canyon/Dayton Creek
009	Stormwater, WS-13 Drainage	Northern/ Arroyo Simi
010	Stormwater, Building 203	Northwestern/Meier Canyon
011	Stormwater, Perimeter Pond	Bell Creek/Bell Canyon
012	Stormwater, Alfa Test Stand (Removed from Permit)	Bell Creek/Bell Canyon
013	Stormwater, Bravo Test Stand (Removed from Permit)	Bell Creek/Bell Canyon
014	Stormwater, Advanced Propulsion Test Facility (Removed from Permit)	Bell Creek/Bell Canyon
015	STP-1 (Removed from Permit)	Bell Creek/Bell Canyon
016	STP-2 (Removed from Permit)	Bell Creek/Bell Canyon
017	STP-3 (Removed from Permit)	Bell Creek/Bell Canyon
018	Stormwater, R-2 Pond Spillway	Bell Creek/Bell Canyon
019	Treated Groundwater (GETS), Non-operational since April 2013	Bell Creek/Bell Canyon
020	Treated Groundwater (GETS), Proposed	Bell Creek/Bell Canyon

Source: LARWQCB, 2015.

Surface Water Ponds

The project site also includes eight surface water ponds (i.e., features) that were used to retain and store water from adjacent or upstream operations (see Figure 4.8-1). Boeing currently manages six of these features to reduce peak flows and subsequent erosion in downstream drainages. These features include investigation sites (R-1 Pond, Perimeter Pond, the two R-2 Ponds (R-2A and R-2B), and Silvernale Reservoir), or they occur within an investigation site (Coca Pond, SRE Pond, and the Building 4056 Excavation). With the exception of the Building 4056 Excavation, these surface water ponds collect stormwater runoff during the wet winter months, and are typically dry in the summer and fall. Each of these eight water features is briefly described on the following page.

R-1 Pond. The R-1 Pond is an approximately 3-million-gallon-capacity reservoir located along Area I Road. It temporarily collects stormwater runoff from the northeastern portion of SSFL. Stormwater, if present in sufficient volumes, is treated and routed for discharge at Outfall 011.

Perimeter Pond. The Perimeter Pond is an approximately 2-million-gallon-capacity reservoir located near the southernmost portion of the Area I Road, north of a large area of undeveloped land. It is downstream of the R-1 Pond. The Perimeter Pond temporarily collects stormwater during heavy and/or long-term precipitation events. Stormwater collected in this pond is routed to R-1 Pond for treatment, and discharge at Outfall 011 leads to the Bell Creek Drainage and is monitored at the NPDES Outfall 001.

Coca Pond. The Coca Pond is an approximately 300,000-gallon-capacity reservoir located in Area II along the Coca Drainage west-northwest of the Coca test stands. Stormwater collected in this pond drains to the R-2A Pond.

Silvernale Reservoir. The Silvernale Reservoir is an approximately 6-million-gallon-capacity reservoir located in Area III and represents the largest surface water body at the project site. The Silvernale Reservoir collects stormwater runoff from the central portion of the project site. Stormwater collected at Outfalls 003, 004, 005, 006, 007, and 010, along with stormwater from R2B Pond, is routed to Silvernale Reservoir for treatment before discharge. Stormwater collected or stored in this pond is treated and discharged at Outfall 018.

R-2A and R-2B Ponds. The R-2 Ponds include two surface water collection features: the larger R-2A Pond (approximately 2.5-million-gallon capacity) and the smaller R-2B Pond (500,000-gallon capacity). Both ponds receive stormwater from the west central portion of the SSFL. The R-2B Pond receives flow from the Silvernale Reservoir and surface water runoff from the Burro Flats area of the project site. The R-2A Pond also collects runoff from the Coca and Delta test stand areas (no current operational discharges). The R-2B Pond drains to the R-2A Pond via a subsurface culvert. Stormwater from the R-2A Pond is routed to Silvernale Reservoir for treatment before discharge leads to the Bell Creek Drainage and is monitored at the NPDES Outfall 018.

SRE Pond. The SRE Pond is an approximately 250,000-gallon-capacity surface water body, located in the north-central portion of Area IV. This pond collects stormwater runoff from the former SRE operational area. 7. Discharge from this pond was pumped to a drainage leading to Silvernale Pond, although there is a controlled overflow discharge pipe that can be used to discharge water to a drainage north of the project site that flows into the Meier Canyon Drainage.

Building 4056 Excavation. The Building 4056 excavation is an approximately 100-foot-diameter circular feature that extends approximately 65 feet deep into bedrock (about 0.2 acre in size) in Area IV. The excavation was performed in anticipation of the installation of Building 4056; however, the building was never constructed. The excavation collects stormwater runoff from the surrounding area, and groundwater. Because of surrounding bedrock exposures, surface water drainage into this feature is localized; water levels in the excavation are quite variable and depend on the amount of pumping from wells nearby (i.e. groundwater elevations) and the amount of runoff generated by rainfall intensity. Depth to water in this excavation ranges between 5 and 50 feet.

Surface Water Quality

The project site covers approximately 2,850 acres where runoff largely occurs as overland flow over natural vegetation and bedrock outcrops since approximately 10 percent of the site was developed. Runoff collects in the various ephemeral drainages onsite that eventually drain into both the Los Angeles River and Calleguas Creek watersheds.

SSFL was historically permitted to discharge excess water from its groundwater treatment system, industrial activities, onsite wastewater reclamation system, and stormwater runoff. Past operations at the project site that have been identified as potential sources of pollutants are listed below (LARWQCB, 2015); Section 4.7, *Hazards and Hazardous Materials,* of this PEIR provides further details on the historical chemical and radionuclide usage at the project site.

- Rocket engine and component testing using rocket propellants
- Nuclear operations, decontamination and decommissioning
- Chemical laser testing
- Energy Technology Engineering Center operations

Other potential sources of pollutants found in receiving waters include atmospheric deposition (e.g., metals and dioxins), ambient precipitation (e.g., dioxins and mercury), wildfires (e.g., dioxins and changes to vegetation that can lead to increased sedimentation), native soils (e.g., metals), and stormwater from surrounding areas.

The LARWQCB has been requiring Boeing to monitor water quality within the drainages at various outfall locations under the NPDES program since September 27, 1976. The project site is currently conducting sampling at outfall locations listed in Table 4.8-1 under NPDES current Permit No. CA0001309 and the LARWQCB Order No. R4-2015-0033 (effective April 1, 2015). With the exception of Outfalls 19 and 20 which monitor the quality of water discharging from the groundwater extraction treatment system, the collection of samples is dependent on precipitation and the presence of sufficient water to sample. Regardless of the lack of precipitation, BMPs are routinely implemented at the site to minimize offsite discharge of runoff pollutants in accordance with the SWPPP for the site.

In addition to the drainages and streams, there are eight surface water ponds present at the project site that formerly supported rocket engine testing operations. The largest of these ponds (R-1 Pond, Perimeter Pond, Silvernale Reservoir, and R-2 Ponds) were used for water storage to support large engine and engine component testing operations. Engine and component test areas also had smaller surface water collection ponds used to contain coolant water runoff or operational discharges (e.g., Coca Pond, Canyon Ponds, and Expendable Launch Vehicle Pond). In addition, there are two surface water features in Area IV (SRE Pond and Building 4056 Excavation).

The remaining surface water ponds at the testing or operational areas are considered perennial ponds since surface water does not persist throughout the year, and they are typically dry in the late summer and fall. However, surface water is consistently present in the R-2 Ponds, Building

4056 Excavation, and Silvernale Reservoir, which are considered permanent surface water bodies at the project site.

As discussed in Chapter 3.0, *Project Description*, of this PEIR, surface water has been included as part of the Surficial Media OU and the sediments within some the ponds may be remediated.

Hydrogeology

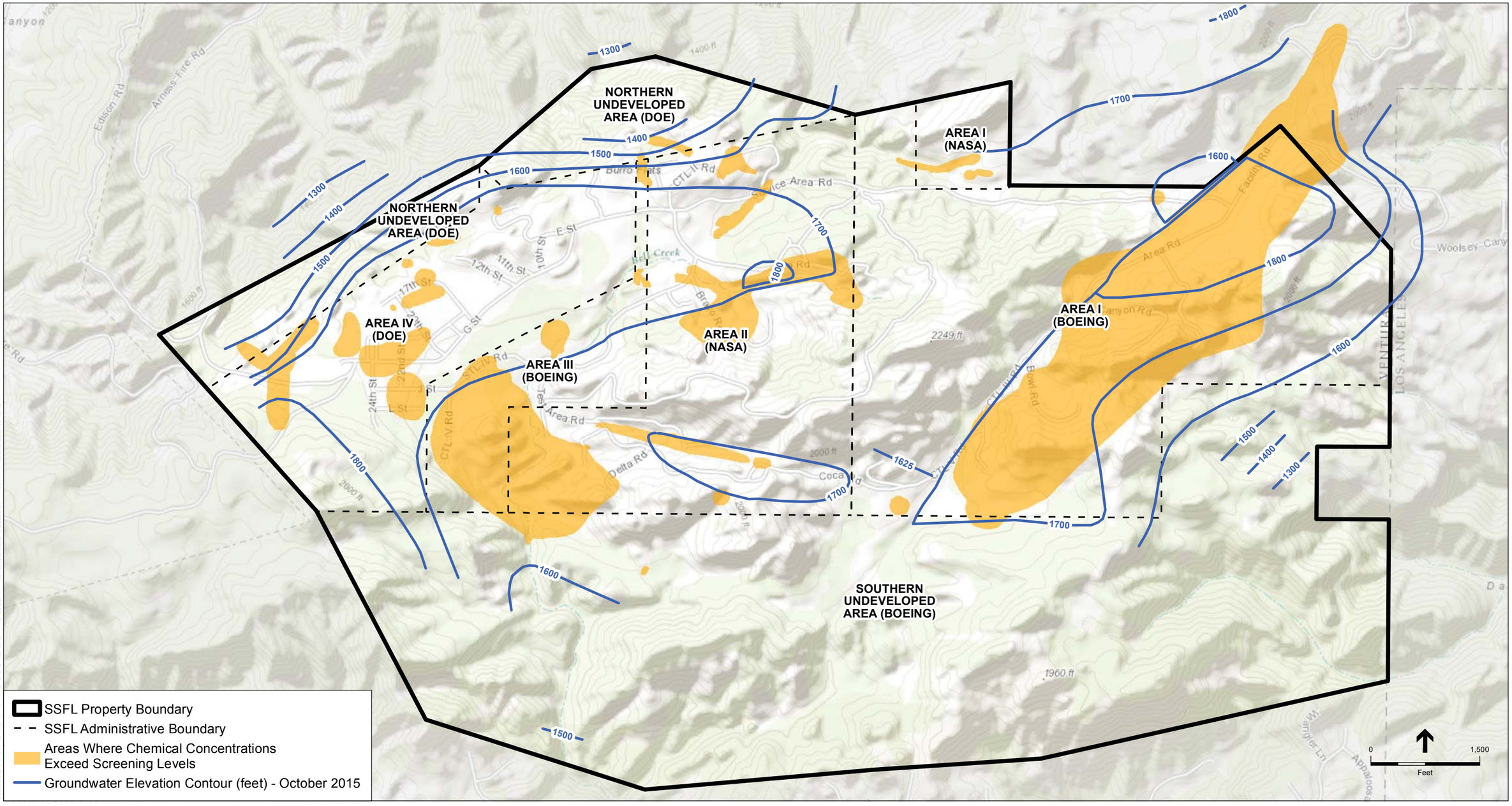
The underlying hydrogeology of the site is dominated by the Chatsworth Formation, with the exception of the southwestern and southeastern portions of the site where either the Santa Susana Formation or the detrital[1] sediments of Lindero Canyon are present. The Chatsworth Formation consists primarily of fractured sandstones and siltstones and has been subdivided into upper and lower units. The lower Chatsworth Formation is exposed in the southeastern portion of the project site (mostly within the Southern Undeveloped Area), while the upper Chatsworth is exposed in much of the remainder of the project site, where much of the proposed cleanup is planned. The upper Chatsworth is further divided into coarser- and finer-grained members. The coarser-grained members are primarily sandstone, and the finer-grained members are mostly interbedded siltstone and shale. Groundwater flow tends to occur in the coarser-grained materials, whereas the finer-grained deposits can act to impede groundwater flow and act as an aquitard.

Overall, the mountain groundwater system is characterized by complex groundwater flow patterns through fractured rock but also perched on and within alluvial materials, as well as influenced by numerous faults. The groundwater elevation contours for October 2015 are shown in **Figure 4.8-2**. Groundwater flow patterns are complex and, in general, flow from recharge areas to pumping areas and hillslope seeps as well as downward toward lowland areas (MWH, 2014). The direction of vertical flow is downward in most locations. Hydrogeologic boundaries are shown in **Figure 4.8-3**.

There are nearly 500 wells and piezometers on and surrounding the site, and the water table varies from as little as a few feet below ground surface in some flat-lying areas to several hundred feet below ground surface beneath topographic highs and areas with residual drawdown from past pumping. Figure 4.8-2 illustrates onsite groundwater elevations.

For regulatory purposes, near-surface groundwater is defined to occur within the site's unconsolidated deposits (e.g., alluvium) and shallow weathered bedrock (Surficial Media OU; see Section 3.3, *Regulatory Orders and Cleanup Requirements*, of this PEIR), whereas deep groundwater occurs in the unweathered bedrock (Chatsworth Formation OU). The near-surface groundwater may be perched or vertically continuous with deeper groundwater.

[1] Detrital rocks are those that are formed primarily of particles or fragments detached from pre-existing rocks by either erosion or weathering.



SOURCE: MWH, 2016; ESA 2016; ESRI 2016

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Figure 4.8-2

Groundwater Elevation Contour

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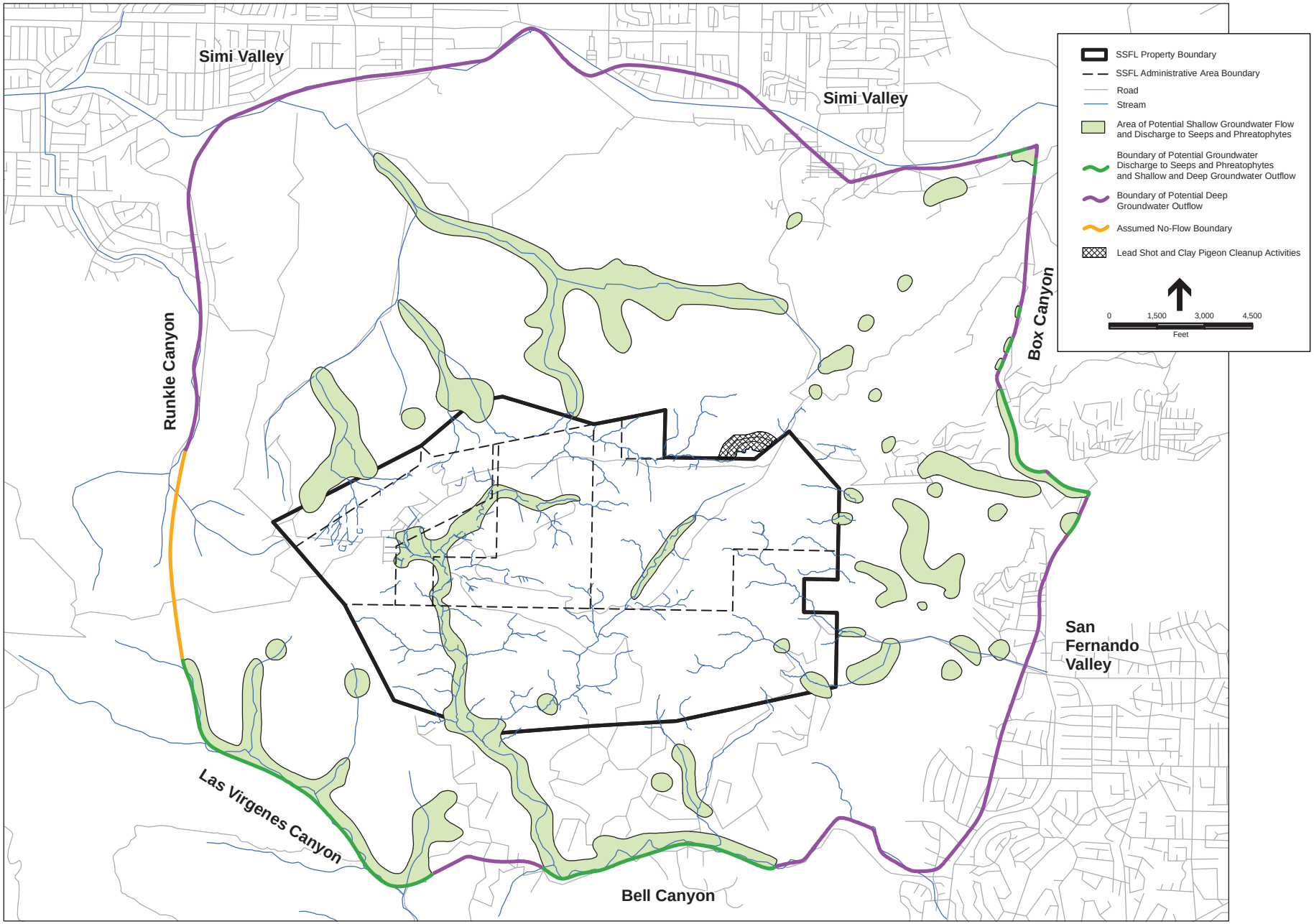

SOURCE: MWH, 2009

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Figure 4.8-3

Hydrogeologic Boundaries

Ground Water Quality

A number of activities have been performed over the years to investigate the nature and extent of contaminants in groundwater at the project site. There are over 500 analytes[2] in the historical SSFL groundwater data set, not including radionuclides (MWH, 2009a). Groundwater-screening reference values[3] have been developed, with over 140 of the analytes detected in at least one groundwater sample collected from the monitoring network as of 2009 and over 100 of the analytes exceeding groundwater screening reference values (MWH, 2009a).

Section 4.7, *Hazards and Hazardous Materials*, of this PEIR discusses the contaminants and radionuclides in more detail. Trichloroethylene, a volatile organic compound used primarily as an industrial solvent, is the most frequently detected contaminant and comprises the majority of groundwater pollutants at the site (MWH, 2009a).

The cleanup of radiological facilities in Area IV involved the identification of radionuclides. As discussed in Section 4.7, *Hazards and Hazardous Materials*, of this PEIR, tritium and strontium-90 are the radionuclides of concern.

Based on groundwater concentrations obtained from site monitoring wells over many years, the extent of contaminants within groundwater within the Chatsworth Formation is considered stable (i.e., moving very slowly) (MWH, 2009a). Contaminants that have entered groundwater at the project site remain within the local groundwater and sandstone matrix, having migrated only a few hundred to a few thousand feet from source locations.

Figure 3-8 shows the areas with chemical concentrations in groundwater that exceed the groundwater cleanup requirements described in Section 3.3.2, *Groundwater*, of this PEIR.

Flooding

Flooding is inundation of normally dry land as a result of rise in the level of surface waters or rapid accumulation of stormwater runoff. The Federal Emergency Management Agency (FEMA), through its Flood Insurance Rate Mapping (FIRM) program, designates areas where flooding could occur during 100-year and 500-year flood events.[4] According to FIRM maps for unincorporated areas of Ventura County, the project site is outside of any 100-year or 500-year flood zone areas (FEMA, 2010a, 2010b).

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2 Analytes are substances whose chemical constituents can be identified and quantified through laboratory analysis. Some of the analytes investigated at the site include petroleum hydrocarbon components, volatile organic compounds, semi-volatile organic compounds, radionuclides, metals, and others.

3 Groundwater screening reference values are analyte-specific concentrations developed for characterization purposes based (in approximate descending order of importance): site-specific groundwater comparison values for metals and inorganics developed by DTSC, isotope activity limits, federal or state primary maximum contaminant levels, state notification levels/advisory levels, federal or state secondary maximum contaminant levels, state taste and odor thresholds, and site-specific values developed using DTSC-approved risk assessment procedures assuming direct ingestion of groundwater.

4 A 100-year flood event has a one percent probability of occurring in a single year. Although infrequent, 100-year floods can occur in consecutive years or periodically throughout a decade. A 500-year flood event has a 0.2 percent probability of occurring in a single year.

4.8.2 Regulatory Setting

4.8.2.1 Federal

Clean Water Act

Under the Clean Water Act (CWA) of 1977, the USEPA seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters by implementing water quality regulations. The NPDES permit program under Section 402(p) of the CWA controls water pollution by regulating sources that discharge pollutants into waters of the United States. The USEPA has delegated authority of issuing NPDES permits in California to the California State Water Resources Control Board (SWRCB), which has nine regional boards. The LARWQCB regulates water quality in the project area. This regulation applies to the program because treated water that is discharged to the surface water outfalls, if any, would be required to comply with the NPDES requirements.

Clean Water Act Section 401

Section 401 of the federal CWA requires that any activity, including the crossing of rivers or streams during road, pipeline, or transmission line construction, that might result in discharges of dredged or fill material into a state water body, be certified by the RWQCB. This certification ensures that the proposed activity does not violate state or federal water quality standards. This regulation would apply to the program if construction activities would result in disturbing waters of the state or the United States.

Clean Water Act Section 402

CWA Section 402 regulates discharges to surface waters of the United States through the NPDES program. In California, the USEPA authorizes the SWRCB to oversee the NPDES program through the RWQCBs. Stormwater discharges are also regulated under CWA Section 402. Construction activities disturbing one acre of land or greater must be covered under the SWRCB General Construction Activity Stormwater Permit. The permit requires preparation of a SWPPP for construction activities. A SWPPP prepared in compliance with the General Permit describes the site, erosion and sediment controls, runoff water quality monitoring, means of waste disposal, implementation of approved local plans, control of post-construction sediment and erosion control measures and maintenance responsibilities, and non-stormwater management controls. Dischargers are also required to inspect construction sites before and after storms to identify stormwater discharge from construction activity, and to identify and implement controls where necessary. This regulation would apply to the program because the cleanup activities would disturb more than one acre of land; this is discussed further in the state NPDES section (see Section 4.8.2.2).

Clean Water Act Section 404

Wetlands are generally considered areas that are periodically or permanently inundated by surface water or groundwater, and support vegetation adapted to life in saturated soil. Wetlands are recognized as important features on a regional and national level due to their high inherent value to fish and wildlife, use as storage areas for storm and floodwaters, and water recharge, filtration, and purification functions. Technical standards for delineating wetlands have been developed by

the USACE which generally defines wetlands through consideration of three criteria: hydrology, soils, and vegetation. Under Section 404 of the CWA, the USACE is responsible for regulating the discharge of dredged or fill material into waters of the United States. The term "waters of the United States" includes wetlands and non-wetland bodies of water that meet specific criteria as defined in the Code of Federal Regulations. This regulation would apply to the program because some of the cleanup activities would occur within waters of the United States, such as the ponds where sediments would be remediated.

Section 303(d) List of Impaired Water Bodies and Total Maximum Daily Loads

Section 303(d) of the CWA requires that each state identify water bodies or segments of water bodies that are "impaired" (i.e., do not meet one or more of the water quality standards established by the state, even after point sources of pollution have been equipped with the minimum required levels of pollution control technology) and need further attention to support their beneficial uses. Inclusion of a water body on the Section 303(d) List of Impaired Water Bodies triggers development of a Total Maximum Daily Load (TMDL) for that water body and a plan to control the associated pollutant/stressor on the list. The TMDL is the maximum amount of a pollutant/stressor that a water body can assimilate and still meet the water quality standards. Typically, a TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. On October 11, 2011, the USEPA approved a revised list of water quality limited segments (herein referred to as the 303(d) list) compiled by the SRWQCB.

Both Calleguas Creek and Los Angeles Rivers have been listed as impaired for a number of different stressors. Calleguas Creek has been found impaired by ammonia, ChemA (tissue), chlordane, chloride, DDT, dieldrin, endosulfan, fecal coliform, nitrogen, PCBs, sediment toxicity, sulfates, total dissolved solids, toxaphene, and toxicity (LARWQCB, 2011). The Los Angeles River has been listed for ammonia, cadmium, copper (dissolved), coliform bacteria, cyanide, diazinon, lead, nutrients (algae), oil, trash, zinc (dissolved), pH, and selenium (LARWQCB, 2011). This regulation applies to the program because the cleanup activities at the project site, such as the discharge of treated groundwater, would be required to comply with the TMDL limitations for the receiving waters downstream.

4.8.2.2 State

Lake and Streambed Alteration Program

Section 1602 of California's Fish and Game Code requires an entity to notify CDFW prior to commencing any activity that may substantially divert or obstruct the natural flow of any river, stream or lake; substantially change or use any material from the bed, channel or bank of any river, stream, or lake; or deposit debris, waste or other materials that could pass into any river, stream or lake. CDFW considers "any river, stream or lake" to include those that are episodic (they are dry for periods of time) as well as those that are perennial (they flow year round). This includes ephemeral streams, desert washes, and watercourses with a subsurface flow. It may also apply to work undertaken within the flood plain of a body of water. CDFW requires an LSA Agreement when it determines that the activity, as described in a complete LSA Notification, may

substantially adversely affect existing fish or wildlife resources. An LSA Agreement includes measures necessary to protect existing fish and wildlife resources.

California Fish and Game Code

Section 5650 of California's Fish and Game Code states that it is unlawful to deposit, dispose of or permit the dumping of solids, liquids or carcasses into state waters.

Section 5650 of California's Fish and Game Code states that it is unlawful to deposit, permit to pass into, or place where it can pass into the waters of the state, or to abandon, dispose of, or throw away, within 150 feet of the high water mark of the waters of the state, any cans, bottles, garbage, motor vehicle or parts thereof, rubbish, litter, refuse, waste, debris, or the viscera or carcass of any dead mammal, or the carcass of any dead bird.

Porter-Cologne Water Quality Act

The Porter-Cologne Act (Division 7 of the California Water Code) provides the basis for water quality regulation within California and defines water quality objectives as the limits or levels of water constituents that are established for reasonable protection of beneficial uses. The Act allows the SWRCB to adopt statewide water quality control plans or basin plans. The purpose of the plans is to establish water quality objectives for specific water bodies. The SWRCB administers water rights, water pollution control, and water quality functions throughout the state, while the RWQCB conducts planning, permitting, and enforcement activities. The Porter-Cologne Act requires the RWQCB to establish water quality objectives, while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Beneficial uses, together with the corresponding water quality objectives, are defined as standards, per federal regulations. Therefore, the regional basin plans form the regulatory standards for meeting state and federal requirements for water quality control. Changes in water quality are allowed only if the change is consistent with the maximum beneficial use designated by the state, does not unreasonably affect the present or anticipated beneficial uses, and does not result in water quality less than that prescribed in the water quality control plans. This regulation applies to the program because the discharge of treated water to outfalls would be required to comply with the basin plan water quality objectives.

DTSC Enforcement and Oversight

The primary state agencies with jurisdiction over the investigation and cleanup of released hazardous materials are the California Environmental Protection Agency, DTSC and the RWQCB. For the project site, environmental characterization and remedial activities are being overseen by DTSC. The majority of the characterization work conducted at the project site has been performed under the RCRA Corrective Action program, as implemented in the 2007 Consent Order and the 2010 AOCs (see Section 2.2.3, *Regulatory History*, of this PEIR).

National Pollutant Discharge Elimination System

Construction Permitting

Cleanup activities associated with the overall site cleanup and initial activities would disturb more than one acre of land surface affecting the quality of stormwater discharges into waters of

the United States. The project would therefore be subject to the *NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities* (Order 2009-0009-DWQ, NPDES No. CAS000002, Construction General Permit; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ). The Construction General Permit regulates discharges of pollutants, including sediment from erosion, in stormwater associated with construction activity to waters of the United States from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface. The permit regulates stormwater discharges associated with construction or demolition activities, such as clearing and excavation; construction of buildings; and linear underground projects, including installation of water pipelines and other utility lines.

Portions of the cleanup activities would fall under the Type 1 linear underground project category if the following conditions are met:

a) Construction occurs on unpaved improved roads, including their shoulders or land immediately adjacent to them.

b) The areas disturbed during a single construction day are returned to their preconstruction condition, or to an equivalent condition (i.e., disturbed soils such as those from trench excavation that are hauled away, backfilled into the trench, and/or placed in spoils piles and covered with plastic) at the end of that same day.

c) Vegetated areas disturbed by construction activities are stabilized and re-vegetated at the end of the construction period.

d) When required, adequate temporary soil-stabilization BMPs are installed and maintained until vegetation has reestablished to meet the permit's minimum cover requirements for final stabilization.

The Construction General Permit requires that construction sites be assigned a Risk Level of 1 (low), 2 (medium), or 3 (high), based both on the sediment transport risk at the site and the receiving waters risk during periods of soil exposure (e.g., grading and site stabilization). The sediment risk level reflects the relative amount of sediment that could potentially be discharged to receiving water bodies and is based on the nature of the construction activities and the location of the site relative to receiving water bodies. The receiving waters risk level reflects the risk to the receiving waters from the sediment discharge. The Construction General Permit contains requirements for Risk Levels 1, 2 and 3, and the linear underground projects Type 1, 2, and 3 categories. If a project does not meet any one or more of the aforementioned conditions under the Type 1 linear underground project category, depending on its location within a sensitive watershed area or floodplain, the level of receiving water risk could be considered low, medium, or high. Depending on the Risk Level, the construction projects could be subject to the following requirements:

- Effluent standards
- Good site-management "housekeeping"
- Non-stormwater management
- Erosion and sediment controls

- Run-on and runoff controls
- Inspection, maintenance, and repair
- Monitoring and reporting requirements

The Construction General Permit requires the development and implementation of a SWPPP that includes specific BMPs designed to prevent pollutants from contacting stormwater and keep all products of erosion from moving offsite into receiving waters. The SWPPP BMPs are intended to protect surface water quality by preventing the offsite migration of eroded soil and construction-related pollutants from the construction area. Routine inspection of all BMPs is required under the provisions of the Construction General Permit. In addition, the SWPPP is required to contain a visual monitoring program, a chemical monitoring program for non-visible pollutants to be implemented if there is a failure of BMPs, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

The SWPPP must be prepared before construction activities begin. The SWPPP must contain a site map(s) that delineates the construction work area, buildings, parcel boundaries, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project area. The SWPPP must list BMPs and the placement of those BMPs that the applicant would use to protect stormwater runoff. Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods, installing sediment barriers such as silt fence and fiber rolls, and maintaining equipment and vehicles used for construction. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations, vehicle and equipment washing, and fueling. The Construction General Permit also sets post-construction standards (i.e., implementation of BMPs to reduce pollutants in stormwater discharges from the site following construction).

In the project area, the Construction General Permit is implemented and enforced by the LARWQCB, which administers the stormwater permitting program. Dischargers are required to electronically submit a NOI and permit registration documents to obtain coverage under this Construction General Permit. Dischargers are responsible for notifying the RWQCB of violations or incidents of noncompliance, as well as for submitting annual reports identifying deficiencies of the BMPs, and how the deficiencies were corrected.

The permit contains several additional compliance items, including: (1) additional mandatory BMPs to reduce erosion and sedimentation, which may include vegetated swales, setbacks and buffers, rooftop and impervious surface disconnection, bioretention cells, rain gardens, rain cisterns, implementation of pollution/sediment/spill control plans, training, and other structural and nonstructural actions; (2) sampling and monitoring for non-visible pollutants; (3) effluent monitoring and annual compliance reports; (4) development and adherence to a rain event action plan; (5) requirements for post-construction; (6) numeric action levels and effluent limits for pH and turbidity; (7) monitoring of soil characteristics onsite; and (8) mandatory training under a specific curriculum.

The project would be required to comply with the permit requirements to control stormwater discharges from the construction sites. To obtain coverage under the Construction General Permit, the contractors would be required to electronically file the NOI along with the permit registration documents, the SWPPP, risk assessment, site map, signed certification statement, and other compliance-related documents required by the Construction General Permit using the Stormwater Multiple Applications and Report Tracking Systems (SMARTS), along with the appropriate permit fee to the SWRCB. The risk assessment and SWPPP must be prepared by a state-qualified SWPPP Developer and implementation of the SWPPP must be overseen by a state-qualified SWPPP Practitioner. A Legally Responsible Person, who is legally authorized to sign and certify permit registration documents, is responsible for obtaining coverage under the permit.

Waste Discharge Requirements

The project site is currently operating under an existing NPDES permit pursuant to Section 402 of the federal CWA and implementing regulations adopted by USEPA and Chapter 5.5, Division 7 of the California Water Code. Discharges from the project site are regulated under waste discharge requirements (WDRs), which serve as an NPDES permit for the site, as contained in Order R4-2015-0033 adopted by the LARWQCB on April 1, 2015 (NPDES No. CA0001309). When originally issued, the permit authorized discharges of stormwater, stormwater mixed with wastewater, and wastewater. Operations at the project site have changed over the years, and wastewater discharges have been eliminated from 15 of the 16 outfalls at the project site. This regulation would apply to the program because treated water may be discharged to surface water outfalls (e.g., Outfall 019).

California Well Standards, Bulletin 74-90

The State of California promulgated water well standards under Bulletin 74-90 to protect groundwater quality. The requirements address well construction techniques and materials, including appropriate locations, materials, annular seals, sealing off strata, well development, rehabilitation and repair, and well destruction. The well standards apply to all water wells, including extraction, injection, and monitoring wells.

4.8.2.3 Regional and County

Los Angeles Regional Water Quality Control Plan (Basin Plan)

The preparation and adoption of water quality control plans (Basin Plans) is required by the California Water Code (Section 13240) and supported by the CWA. Section 303 of the CWA requires states to adopt water quality standards which "consist of the designated uses of the navigable waters involved and the water quality criteria for such waters based upon such uses." According to Section 13050 of the California Water Code, Basin Plans consist of a designation or establishment for the waters within a specified area of beneficial uses to be protected, water quality objectives to protect those uses, and a program of implementation needed for achieving the objectives. Because beneficial uses, together with their corresponding water quality objectives, can be defined per federal regulations as water quality standards, the Basin Plans are regulatory references for meeting the state and federal requirements for water quality control.

Ventura County is included under the jurisdiction of the LARWQCB. This regulation applies to the program because treated water discharged to the outfalls would be required to comply with the Basin Plan.

Ventura County Well Ordinance No. 4184

The Ventura County Well Ordinance No. 4184 ensures that the construction, maintenance, operation, use, repair, modification, and destruction of water wells are executed in such a manner that the groundwater would not be contaminated or polluted, and that water obtained from water supply wells would be suitable for use and would not jeopardize the health, safety, or welfare of the community in Ventura County. The construction or destruction of any groundwater wells, even if used only for monitoring, must be permitted through the County.

Ventura Countywide Stormwater Quality Management Program

The Ventura Countywide Stormwater Quality Management Program includes the cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, Simi Valley, Santa Paula, Thousand Oaks, Ventura, the County of Ventura, and the Ventura County Watershed Protection District. These partners work together to improve stormwater quality, monitor the health of our watersheds and meet the compliance requirements of the Ventura Countywide NPDES Municipal Separate Storm Sewer System (MS4) permit, adopted by the State under the Clean Water Act.

The first stormwater permit for Ventura County was adopted in 1994 and included all 10 cities, the County, and the Watershed Protection District. On July 27, 2000, a second permit was adopted that included logical and incremental increases in the requirements. That 5-year permit was on administrative extension until May 7, 2009, when Board Order 09-0057 was adopted. Shortly after adoption of that permit, the Regional Board rescinded it to hold a new adoption hearing. On July 8, 2010, Order No. R4-2010-0108 was adopted with minor changes. The 2010 permit had a new set of implementation deadlines associated with it and replaced the order adopted in 2009 in its entirety. This regulation would apply to the program if treated water is discharged to surface water outfalls on the northern side of the project site that would drain into Ventura County.

4.8.3 Thresholds of Significance

For the purposes of this PEIR, DTSC has based the thresholds of significance on the checklist questions regarding hydrology in Appendix G of the CEQA Guidelines. In addition, Ventura County's Initial Study Assessment Guidelines along with Los Angeles County standards have been incorporated, as appropriate, into the analysis. Please see Chapter 7.0, *Impacts Found Not to Be Significant*, of this PEIR for a discussion of other issues associated with the evaluation of hydrologic resources where the characteristics of the project made it clear that effects would not be significant and further evaluation in this section was not warranted.

Based on the size and scope of the project and the potential for impacts, the criteria identified below are included for evaluation in this section.

Would the project:

4.8-1 Violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality (refer to Impact Statements 4.8-1a and 4.8-1b)?

4.8-2 Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted) (refer to Impact Statements 4.8-2a and 4.8-2b)?

4.8-3 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation onsite or offsite (refer to Impact Statements 4.8-3a and 4.8-3b)?

4.8-4 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite (refer to Impact Statements 4.8-4a and 4.8-4b)?

4.8-5 Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff (refer to Impact Statements 4.8-5a and 4.8-5b)?

4.8.4 Methodology

This impact section assesses potential impacts related to hydrology and water quality based on the potential for project activities to change hydrologic and water quality conditions during cleanup activities, using existing site conditions as a baseline for comparison. The potential for adverse hydrologic and water quality impacts is analyzed primarily using available data from site-specific investigations. In addition, the severity and significance of hydrology and water quality impacts are analyzed in the context of existing regulations and policies.

As noted in Chapter 3.0, *Project Description*, of this PEIR, any one or a combination of remedial activities and technologies could be used to achieve the objectives of the project. Consequently, cleanup activities and remedial technologies are evaluated in this section at a programmatic level of detail. In addition, given that sufficient information is available regarding the initial activities, the following analysis also evaluates those initial activities at a project level of detail. The program- and project-level analyses are each discussed for all of the impacts identified in this PEIR.

For the purposes of this analysis, cleanup activities include the excavation of soils, demolition and removal of facilities, and the construction of soil and groundwater treatment systems (e.g., soil vapor extraction systems, biotreatment systems, extraction wells, groundwater treatment systems). These cleanup activities would represent a series of relatively short-term events that would occur at various times spread out over time (10 to 15 years) across the entire project site.

Operations activities would include the operational phases of treatment technologies (soil vapor extraction, groundwater extraction and treatment, in situ or ex situ bioremediation, air sparging systems, etc.), but do not include soil excavation. In addition, the operations activities include the post-remediation monitoring activities conducted to verify that remedial objectives have been achieved.

4.8.5 Analysis of Project Impacts

The following text describes the potential environmental impacts related to hydrology and water quality associated with implementing the overall site cleanup versus initial activities, demarcated as impact "a" and "b" respectively. As presented in Section 3.7*, Initial Activities*, the initial activities include eight different projects. Depending on the degree to which impacts of the initial projects would be similar to or different from each other, the impact analysis for the initial projects for some thresholds has been combined accordingly (i.e., the number of separate discussion for impact for each threshold ranges from one to eight). Following each potential impact is a significance determination for each potential impact.

4.8.5.1 Water Quality Standards

Program Assessment

Impact 4.8-1a: Would implementation of the **overall site cleanup** violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality?

Overall Site Cleanup (Impact 4.8-1a)

Figures 3-5 and 3-8 show the extent of chemicals in soil and groundwater, respectively, at concentrations above cleanup requirements. The investigative process to date has identified various remedial approaches and treatment technologies that would be appropriate and effective in cleaning up affected soil and groundwater at the project site. A number of different remedial technologies have been developed to address the ranging site conditions (topography, hydrogeology, vegetation, access, sensitive biological and cultural resources, etc.) where multiple media are affected by a variety of contaminants and radionuclides of concern at a range of concentrations.

The water quality standards applicable to the project would be the cleanup requirements derived from the 2007 Consent Order and would apply to remediation of the groundwater and associated discharge of treated water. The WDRs would be regulated by the General Permit for Stormwater Discharges Associated with Construction Activity (Order No. 2009-0009-DWQ; NPDES Permit No. CAS000002) for cleanup activities. Discharge to surface water outfalls would be regulated by NPDES Permit No. CA0001309.

The cleanup activities will be described in DTSC-approved cleanup decision documents for each RP, as well as closure plans for Boeing and DOE. These cleanup decision documents would describe the specific measures to clean up soil and groundwater with chemical and radionuclide concentrations above cleanup standards, as described in Sections 3.6 and 3.7, and prevent the

migration of contaminants into surface waters and groundwater. The objective of the various treatment methods is to remove or treat contaminants and reduce the potential for impacts on the environment, including water quality.

Soil remediation activities would typically include substantial earthwork, especially for areas that would be remediated through excavation of contaminated soils that are either transported elsewhere onsite for bioremediation or hauled offsite for disposal. Other earthwork activities, such as installation of soil vapor extraction wells and the injection well for treated groundwater, and construction of treatment pads, would also disturb existing soils through excavation, drilling, or trenching. Completion of these activities would require the use of heavy equipment such as excavators, drilling rigs, backhoes, front-end loaders, and similar equipment. The disturbance of these areas could expose soils to the effects of wind and water erosional forces that could adversely affect receiving waters if not managed appropriately.

To control the impact of erosion, sedimentation, and other pollutants on receiving waters during earthwork activities, the Construction General Permit requires the implementation of BMPs to eliminate or reduce the discharge of pollutants in stormwater and cleanup activity-related non-stormwater discharges (also described in Mitigation Measures BIO-5, HYDRO-1, and HYDRO-2). Under the Construction General Permit and Mitigation Measure HYDRO-1, the project would be required to prepare a SWPPP and implement BMPs detailed in the SWPPP during earthwork activities. BMPs would be designed to minimize erosion and sedimentation and prevent spills using silt fences around soil piles, tarps/covers for soil piles, and gravel bag berms along temporary flow paths to control and minimize erosion and sedimentation, among other measures. Various BMPs may be needed at different times during earthwork activities because such activities would change site conditions. Selection of erosion control BMPs would be based on minimizing the extent of disturbed areas, stabilizing disturbed areas, and protecting slopes, channels, and washes. Selection of sediment control BMPs would be based on retaining sediment onsite and controlling the site perimeter. In addition, the SWPPP would identify the following: equipment storage, cleaning and maintenance areas/activities; points of ingress and egress to the site; material loading, unloading, and storage practices and areas, including materials, equipment, or vehicles that may come in contact with stormwater. With implementation of the SWPPP BMPs (Mitigation Measure HYDRO-1) in compliance with the Construction General Permit, the potential impacts during cleanup activities would be less than significant relative to water quality standards and WDRs.

Implementation of Mitigation Measures BIO-5, HAZ-3, and HYDRO-2 would further address the management of materials and the restoration of disturbed areas after cleanup. A soil management plan required by Mitigation Measure AQ-3 describing waste characterization, soil handling procedures, and stockpile and container management would be prepared by each RP prior to implementing the cleanup activities. The soil management plans would include describing the appropriate waste containers and materials handling procedures, stockpile configurations and containment measures, and equipment decontamination procedures, all designed to contain wastes and prevent spillage. Prior to leaving the site, trucks used for hauling impacted soils offsite would be inspected and cleaned as necessary to remove loose debris in tire wells and on

the trucks' exteriors. Mitigation Measure HAZ-3 requires hazardous materials business plans that would describe procedures for the use of hazardous materials (e.g., oxidizers brought onsite for the treatment of solvents in groundwater); including describing the nature of each chemical's hazards, appropriate storage and handling procedures, and cleanup procedures in the event of a spill. Finally, the O&M plan required by Mitigation Measure HYDRO-2 would describe procedures to verify that treatment systems continue to be effective. The O&M plan would include the periodic inspection of caps and covers for soil cleanup areas, ensuring that erosion and stormwater control continue to prevent the migration of sediment and other pollutants into drainages and surface water. Soil vapor and groundwater wells would be sampled based on DTSC-approved sampling and analysis plans, to track and confirm the progress of cleanup.

Once remediation objectives are met and the soils with concentrations above the cleanup requirements have been transported to an offsite disposal facility, excavated areas would be partially backfilled[5] with clean fill and the sides of the excavation would be sloped to prevent new ponding and minimize erosion. As a result, natural drainage patterns would be restored to the extent practicable. If previously vegetated, Mitigation Measure BIO-5 requires that the areas would be reseeded with native vegetation and irrigated until vegetation has stabilized the soil surface. Therefore, with implementation of the backfilling and revegetation plans within the DTSC-approved cleanup decision documents, impacts of the potential post-cleanup activities from cleanup projects would be less than significant with mitigation incorporated relative to water quality standards and WDRs.

Groundwater cleanup activities (groundwater extraction and treatment system, vapor extraction and air sparging, thermal enhanced vapor extraction, in situ chemical oxidation, in situ enhanced biological treatment, monitored natural attenuation, passive treatment at seeps, and bedrock removal for strontium-90) would occur over varying time frames but could be relatively long-term activities. While some vehicle traffic would be required for operational, maintenance, and monitoring activities, site uses in these areas would be relatively light with limited disturbance to site soils. Extracted groundwater, water from the seeps, and soil vapor would be treated prior to discharge in accordance with previously listed NPDES and other appropriate permits as overseen by DTSC, LARWQCB, and VCAPCD.

Treated water would be injected into the Chatsworth Formation at the proposed Injection Well IN-1 located in Area I or to existing surface water Outfall 019 and the proposed Outfall 020 (see Figure 3-8). The treated water is required to be discharged in accordance with the existing NPDES Permit No. CA0001309 and the LARWQCB Order No. R4-2015-0033 (effective April 1, 2015) permit requirements. The discharge of treated groundwater to Outfalls 019 and 020 would be permissible only after the appropriate approvals are secured from CDFW. Discharges of treated groundwater would be monitored to ensure that the constituents are within effluent

[5] Backfill volumes would be based on specific excavation geometry. It is estimated approximately one-third of the excavated volume would be replaced in Areas I, II, and III, and approximately three-quarters of the excavated volume would be replaced in Area IV due to the deeper nature of the excavation. The goal of the backfill is to stabilize the excavations and return the site to sustainable, natural contours with minimal erosion issues.

limitations that are set by the NPDES permit. These outfalls would be monitored under the existing permit to ensure that treatment of extracted water is meeting water quality objectives (including those of the Basin Plan) and discharge limitations as defined within the permit. Any exceedances would require cessation of the groundwater treatment system and necessary adjustments to ensure effluent limitations can be met.

Following completion of the cleanup remedies, the O&M plan required by Mitigation Measure HYDRO-2 would be implemented and would include long-term groundwater-monitoring requirements. The long-term groundwater-monitoring program would be designed to ensure that former source areas and the project site perimeter are monitored to evaluate the effectiveness of the remediation efforts. During the proposed long-term monitoring program, if any contaminant concentrations in a perimeter or downgradient well are detected and confirm above cleanup requirements, then additional remediation or characterization, would be required.

The overall purpose of the project is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. As a result, all facets of the project that involve the potential discharge or transport of pollutants would be closely monitored and designed to minimize the potential to violate any water quality standards or discharge requirements.

In areas where the hydrogeologic evaluation and remediation involves multiple-depth water-bearing zones, the construction and decommissioning of wells could become conduits for cross contamination if not managed appropriately. In order to prevent such an occurrence, all well construction and destruction activities would be in accordance with the California Well Standards and Ventura County Well Ordinance No. 4184, both described in Section 4.8.2.3. In addition, DTSC has developed the following well guidelines for contaminated sites: *Well Design and Construction for Monitoring Groundwater at Contaminated Sites* (DTSC, 2014). These standards would ensure that new wells are screened appropriately to target the correct zone of contaminated or suspected contamination in a way that isolates other zones. For wells that are no longer in use, the decommissioning typically involves filling the well borehole with a grout mixture that ensures that cross contamination cannot occur nor provide a means of surface spills to access deeper zones of the aquifer.

> Conclusion: The overall cleanup project would involve activities that could affect water quality. All excavation work would be completed in accordance with the DTSC-approved cleanup decision documents the Construction General Permit and Mitigation Measures AQ-3, BIO-5, HYDRO-1, HYDRO-2, and HAZ-3, to limit exposure of soils and reduce the potential for discharging pollutants. This impact would be less than significant with mitigation incorporated.

***Impact 4.8-1a Determination**: The **overall site cleanup** could violate water quality standards or WDRs or otherwise substantially degrade water quality. Mitigation Measures AQ-3, BIO-5, HYDRO-1, HYDRO-2, and HAZ-3 would mitigate this impact. This impact would be **less than significant with mitigation incorporated**.*

Initial Project Assessment

Impact 4.8-1b: Would implementation of the **initial activities** violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality?

Initial Activities (Impact 4.8-1b)

This discussion addresses the two initial excavation projects described in Section 3.7, *Initial Activities*, of this PEIR:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant

As discussed previously for the impacts of the overall site cleanup, all excavation and earthwork activities would be completed in accordance with the soil handling protocols and BMPs described in the DTSC-approved cleanup decision documents, a soil management plan required by Mitigation Measure AQ-3, a revegetation plan required by Mitigation Measure BIO-5, a SWPPP required by Mitigation Measure HYDRO-1, a hazardous materials plan required by Mitigation Measure HAZ-3 and the O&M plan required by Mitigation Measure HYDRO-2 to manage ground-disturbing activities in a manner that would minimize offsite transport of contaminants. Excavated soil placed into haul truck trailers would be covered to prevent spillage and control dust. Truck wheels and undercarriages would be washed prior to exiting the work area in a fully contained wheel wash area. Wheel wash wastewater would be disposed of at an appropriate waste facility in accordance with the protocols in the cleanup decision documents. With implementation of the Mitigation Measures AQ-3, BIO-5, HYDRO-1, HYDRO-2 and HAZ-3, along with cleanup decision document protocols, potential impacts from the initial activities would be less than significant related to water quality standards and WDRs.

Once remediation objectives are met and the soils with chemical concentrations above the cleanup requirements have been transported to an offsite disposal facility, the excavated areas would be partially[6] backfilled with clean fill and the sides of the excavation would be sloped to prevent new ponding and minimize erosion in accordance with the DTSC-approved cleanup decision documents and Mitigation Measure BIO-5. As a result, natural drainage patterns would be restored to the extent practicable. If previously vegetated, the areas would be reseeded with native vegetation and irrigated until vegetation has been stabilized on the soil surface as required by Mitigation Measure BIO-5. Therefore, with implementation of the backfilling and re-vegetation plans as found within the DTSC-approved cleanup decision documents, the potential post-excavation impacts related to water quality standards and WDRs from the initial activities would be less than significant with mitigation incorporated.

[6] Backfill volumes would be based on specific excavation geometry. It is estimated approximately one-third of the excavated volume would be replaced in Areas I, II, and III, and approximately three-quarters of the excavated volume would be replaced in Area IV due to the deeper nature of the excavation. The goal of the backfill is to stabilize the excavations and return the site to sustainable, natural contours with minimal erosion issues.

Conclusion: The initial activities would involve activities that could affect water quality. All excavation work would be completed in accordance with the DTSC-approved cleanup decision documents, Construction General Permit and Mitigation Measures AQ-3, BIO-5, HYDRO-1, HYDRO-2, and HAZ-3 to limit exposure of soils and reduce the potential for discharging pollutants. This impact would be less than significant with mitigation incorporated.

DOE Building Demolition Activities (Impact 4.8-1b)

As discussed in Section 3.7.3, *Demolition Activities*, of this PEIR, these projects would include demolishing 24 buildings in Area IV using standard construction equipment and demolition techniques, followed by placing the demolition areas in a safe and stable configuration to facilitate later soil characterization and remediation. Implementation of this initial project would also include excavation to remove subsurface vaults under two of the buildings followed by backfilling and/or stabilization of the vault excavation area prior to placing the sites into safe and stable conditions. Figure 3-13 shows the locations of these facilities.

The demolition activities include removal of the remaining DOE-owned facilities within Area IV to aid in access to underlying areas that may require remediation efforts that would otherwise not be easily accessible. Prior to demolition and excavation, building permits (as demolition is considered a "construction activity" that is covered under building permits) and grading permits (for the excavations) would be secured from Ventura County. During review of construction documents submitted to obtain building and grading permits, the County would evaluate the demolition procedures, including previous and proposed testing for hazardous building materials. The buildings have previously been screened for residual radiological contamination and evaluated for hazardous materials such as lead-based paint, mercury switches, and ACMs, but they would receive additional screening during demolition activities. Any hazardous building materials identified would be abated and disposed of in an appropriately permitted facility, and any identified radiologically impacted debris would be sent to an appropriate disposal facility.

The work plans prepared for demolition activities would include interim measures to establish post-demolition safe and stable conditions (i.e., the areas would be configured to prevent excessive erosion and to prevent physical hazards to personnel) pending the future projects to test and, if needed, clean up soil beneath the demolished facilities. Following completion of remediation activities, the areas would then be backfilled with clean soil and restored as much as possible to conditions present prior to occupation of the site, as discussed previously for the overall site cleanup (Impact 4.8-1a).

As described for the overall site cleanup, Mitigation Measures AQ-3, BIO-5, HYDRO-1, HYDRO-2, and HAZ-3 would ensure that the discharge of pollutants in stormwater and cleanup activity-related non-stormwater discharges is minimized and meets regulatory limits. Selection of sediment control BMPs would be based on retaining sediment onsite and controlling the site perimeter. With implementation of the SWPPP BMPs in compliance with the Construction General Permit, potential impacts relative to water quality standards and WDRs during demolition activities would be less than significant.

Conclusion: Demolition activities could adversely affect water quality. Compliance with County permits, NPDES Permit No. CA0001309, the Construction General Permit–required SWPPP, and continuous screening and monitoring of building debris for radiological contents or hazardous building materials would ensure the appropriate handling, storage, and disposal of any identified hazardous materials. With compliance with these agency-approved protocols and permit requirements, and implementation of Mitigation Measures AQ-3, BIO-5, HYDRO-1, HYDRO-2, and HAZ-3, impacts related to violations of water quality standards would be less than significant with mitigation incorporated.

RCRA Hazardous Waste Facility Closure (Impact 4.8-1b)

This discussion addresses the five closure projects described in Section 3.7.4, *RCRA Post-Closure and Hazardous Waste Facility Closure*, of this PEIR:

- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure

The closure of three former hazardous waste facilities, all currently nonoperational, would occur under the RCRA Hazardous Waste Facility Permitting Program. For these efforts, the term "closure plan" is approximately analogous to the cleanup decision documents discussed previously in this section and would be prepared for each of these facilities prior to closure.

The TTF is located within the southwest portion of the Area I Burn Pit, as shown in Figure 3-10, and consists of a Concrete Pad 2 and Burn Pit 2. Boeing would submit a closure plan for the TTF to DTSC for review and approval prior to implementation of the facility closure. The TTF closure project would include additional sampling, excavation, and disposal of about 300 CY of in situ soil and concrete debris to an offsite RCRA-permitted disposal facility, followed by confirmation sampling and restoration. The closure methods for the TTF are similar to those of the overall site cleanup. Excavated areas would be restored by backfilling and recontouring the area so that the overall drainage pattern in the area follows a meandering and relatively natural pathway. Vegetated areas, if any, would be reseeded in accordance with Mitigation Measure BIO-5.

Closure of the RMHF in Area IV would include closure of Buildings 4021, 4022, and 4621 and the associated Mixed Waste Storage Yard, as shown in Figures 3-10 and 3-13. The RMHF closure proposes to demolish these buildings using standard construction equipment and demolition techniques. Staging areas would not require grading or significant removal of vegetation. The waste would be characterized in accordance with the DTSC-approved closure plan to identify and document proper handling and disposal. Remediation of soil beneath and surrounding the buildings would be conducted in a subsequent and separate phase. Following demolition, demolition areas would be placed in a safe and stable configuration to facilitate later soil characterization and remediation.

The HWMF is located within Area IV, as shown in Figures 3-10 and 3-13, and consists of Buildings 4029 and 4133. These buildings have been previously screened and approved for unrestricted use, indicating that radioactive materials are not present. The HWMF closure proposes to demolish these buildings using standard construction equipment and demolition techniques. Staging areas would not require grading or significant removal of vegetation. All building materials from the HWMF (building debris consisting of concrete, steel, other building materials, and appurtenances) would be resized for transport and disposal to an appropriate permitted disposal facility. The waste would be characterized in accordance with DTSC-approved closure plans to identify and document proper handling and disposal. Remediation of soil beneath and surrounding the buildings would be conducted in a subsequent and separate phase. Upon completion of demolition, the demolition areas would be placed in a safe and stable configuration to facilitate later soil characterization and remediation.

The Construction General Permit and Mitigation Measure HYDRO-1 would require implementation of a SWPPP. BMPs within the SWPPP would include specific measures to ensure that impacts would be less than significant. Impacts would be further reduced by the implementation of the DTSC-approved closure plans, a soil management plan required by Mitigation Measure AQ-3 and an O&M plan required by Mitigation Measure HAZ-3.

> Conclusion: The RCRA Hazardous Waste Facility Closure activities could affect water quality. However, all activities would be completed in compliance with the DTSC-approved closure plan, mitigation measures and BMPs in the SWPPP required by the Construction General Permit. With compliance with the closure plan and implementation of the BMPs and Mitigation Measures AQ-3, BIO-5, HYDRO-1, HYDRO-2, HAZ-3 impacts related to erosion or soil loss would be less than significant.

Areas I, II, and III Impoundment Post-Closure (Impact 4.8-1b)

As discussed in Section 3.7.4, *RCRA Post-Closure and Hazardous Waste Facility Closure*, of this PEIR, five historical surface impoundments (Engineering Chemistry Laboratory, Advanced Propulsion Test Facility 1, Advanced Propulsion Test Facility 2, System Test Laboratory-IV-1, and System Test Laboratory-IV-IV-2) in Areas I and III were closed under the RCRA permitting program in the late-1980s. Four historical surface impoundments (Alfa Bravo Skim Pond, Storable Propellant Area 1, Storable Propellant Area 2, and Delta) in Area II were closed under the RCRA permitting program in the mid-1980s. Figure 3-14 shows the locations of these facilities. The 1980s closure activities included excavation and offsite disposal of the residual wastes, liquids, sediments, liner, and underlying contaminated soils. Some underlying contaminated material remains in the bedrock, and the groundwater has been contaminated from past releases from the surface impoundments.

The activities associated with the impoundment permits are limited to managing the existing impoundments through monitoring and periodic maintenance. The primary maintenance activities would include ongoing maintenance of the surface impoundment caps, surface water diversion facilities, and monitoring well network used to evaluate ongoing groundwater conditions. Monitoring would include regular inspections of the impoundment caps by a work crew of up to

three people, diversion facilities and monitoring wells, and ongoing monitoring and evaluation of the impacted groundwater, in accordance with the conditions stipulated in the corresponding water quality sampling and analysis plan. No ground disturbance would occur and the impact would be less than significant. DTSC would evaluate the need for additional cleanup at the impoundments, if any, based on the results of the ongoing investigation and monitoring program. Any additional remedial actions, if necessary, would be described in a subsequent cleanup decision document.

Conclusion: The initial activities would be completed in accordance with a post-closure monitoring and maintenance plan, which be designed to ensure that human health and the environment are protected from any residual contamination at these former impoundment areas. Monitoring and maintenance of existing caps in accordance with RCRA closure requirements would ensure that previous closure efforts continue to perform as designed and protect water quality. The potential impact related to water quality would be less than significant with mitigation incorporated.

Impact 4.8-1b Determination: *The* ***initial activities*** *could violate water quality standards or WDRs or otherwise substantially degrade water quality. This impact would be* ***less than significant*** *with implementation of Mitigation Measures AQ-3, BIO-5, HYDRO-1, HYDRO-2, and HAZ-3.*

4.8.5.2 Groundwater Supplies

Program Assessment

Impact 4.8-2a: Would implementation of the **overall site cleanup** substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?

Overall Site Cleanup (Impact 4.8-2a)

Groundwater at the project site is not currently used for water supply purposes. As part of the project, a majority of the former water supply wells at the project site would be abandoned/ destroyed in accordance with permit requirements. The cleanup activities involve a variety of remediation approaches that include groundwater extraction and treatment. Extracted and treated water would be re-injected into the underlying aquifer at the proposed Injection Well IN-1 in Area I (may be spread out to multiple injection wells) following treatment or it would be discharged to surface water Outfalls 019 or 020 (see Figure 3-8 for well and outfall locations), or may be discharged to the municipal sewer system in accordance with a discharge permit from the facility. Otherwise, the project would not substantively interfere with groundwater recharge as the majority of restoration efforts following completion of remedial objectives would be designed to

return conditions as close as possible to natural flow patterns that were present prior to occupation of the site.

The only proposed groundwater remediation methods that would include the pumping of groundwater would be the GETS and the DOE system described in Section 3.6.2.1. Groundwater pumping rates for extraction would be determined based on modeling and observed conditions with the goal of establishing a cone of depression in order to create a zone of capture to contain groundwater that is contaminated above the cleanup requirements. Pumping rates would be set at levels that do not decrease groundwater levels to below the tops of well screens or pump intakes and cause cavitation[7] that would damage the pumps. In addition, injection of treated groundwater back into the aquifer, if approved by the RWQCB, would assist in recharging the groundwater, ensuring that regional groundwater supplies are not substantially depleted. In the event that the treated groundwater is discharged to the municipal sewer system, there could be a temporary lowering of the groundwater table during the groundwater pumping period of remediation. However, as noted above, pumping rates would be monitored to ensure that consistent pumping is feasible and cavitation is avoided as a standard operating procedure. Once the cleanup requirements are reached, the groundwater extraction system(s) would be removed and groundwater pumping terminated, which would allow groundwater levels to return to natural, pre-pumping levels. Therefore, there would be minimal net deficit in aquifer volume or lowering of the local groundwater table, and impacts would be less than significant.

Additionally, most facilities at the project site would be demolished and removed. Removal of these impervious surfaces would result in increasing the area within the project site where recharge could occur, resulting in a beneficial impact.

> Conclusion: The overall site cleanup could deplete groundwater supplies. However, groundwater extraction and treatment at the project site would be designed to extract groundwater at a rate that can be maintained for the duration of the remediation effort. Some of the treated groundwater could be returned to the underlying aquifer through an injection well or wells. Groundwater at the site is not currently used for water supply purposes and there are no anticipated future uses of underlying groundwater for water supply contemplated as part of the project. Eventually, upon completion of cleanup activities, the groundwater pumping would be terminated, which would allow the natural recharge to occur once the groundwater quality goals are met. Therefore, impacts related to substantively depleting groundwater supplies would be less than significant.

[7] Cavitation in a water pump impeller is the result of a drop in pressure of a moving liquid through the impeller's opening. This reduced pressure causes bubbles to form, and as the pressure of the liquid continues to fluctuate and drop, the bubbles collapse. The introduction of air bubbles or vapor pockets can also be caused by water cascading down a well due to exposure of the well screen to air. Implosions of these vapor pockets can be so rapid that a rumbling or cracking noise is produced, which sounds like rocks passing through the pump. The hydraulic impacts caused by the collapsing bubbles are strong enough to cause areas of fatigue on the metal impeller surfaces and a decrease in pump performance may be noted, depending on the severity of the cavitation.

Impact 4.8-2a Determination: *The **overall site cleanup** would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table that could impact existing or planned land uses. This impact would be **less than significant**. No mitigation is required.*

Initial Project Assessment

Impact 4.8-2b: Would implementation of the **initial activities** substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?

Initial Activities (Impact 4.8-2b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The initial activities described in Section 3.7 would involve soil excavation and disposal, building demolition, and maintenance activities in all four administrative areas. The initial activities would not involve use of groundwater. Once remedial objectives are reached and the excavated areas are backfilled and revegetated with native species, there would be no use of underlying groundwater supplies and thus no impact to the aquifer volume.

> Conclusion: Groundwater use for the initial activities would be of relatively short duration, would not be substantive, and would not result in lowering of the underlying aquifer; therefore, impacts related to depletion of groundwater supplies would be less than significant.

Impact 4.8-2b Determination: *The **initial activities** would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table that could impact existing or planned land uses. This impact would be **less than significant.** No mitigation would be required.*

4.8.5.3 Erosion

Program Assessment

Impact 4.8-3a: Would implementation of the **overall site cleanup** substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?

Overall Site Cleanup (Impact 4.8-3a)

The project site is largely open space where stormwater runoff occurs as sheet flow that is collected in the various drainages that intersect the project site. There are some impervious surfaces on the project site from the remaining facilities from former operations, as well as some paved roads. The overall site cleanup does not include the introduction of any new impervious surfaces that might concentrate flows in areas to cause erosion.

Many of the remediation technologies that would be employed at the site, such as excavation and soil removal, would temporarily alter drainage patterns at the site during excavation activities. However, as previously discussed, all earthwork activities would be completed in accordance with the BMPs included as part of the required Construction General Permit, as well as the protocols identified in the DTSC-approved cleanup decision documents. These BMPs are designed to minimize the potential for erosion or siltation onsite or offsite and have proven effective in many other similar projects. Compliance with the Construction General Permit, also described in Mitigation Measure HYDRO-1 would require preparation of a SWPPP that includes descriptions of BMPs that would reduce the potential for discharge of pollutants in runoff during earthwork activities. Typical BMPs would include silt fences, fiber rolls, stockpile management, spill prevention and control, and the use of protective sheeting or tarps to minimize erosion from, and stabilization of, disturbed surfaces. The use of silt fences, hay bales, and other equivalent erosion control measures would limit the erosion potential to less-than-significant levels.

Excavated areas would be backfilled and recontoured with soils from the surrounding area and/or supplemental backfill. The overall drainage pattern at the project site would be similar to pre-excavation conditions. The Mitigation Measure HYDRO-1 would require that the finished surfaces of the backfilled excavations do not create new areas of ponding that did not previously exist. Existing ponds that are excavated to remove sediment with contaminants above cleanup requirements would be restored by removing earthen dams, as needed, and reestablishing natural drainage patterns. Removal of the earthen dams would likely require a Section 404 CWA permit, Section 401 Water Quality Certification (WQC), and/or streambed alteration agreement (see also

discussion of these permits in Section 4.3, *Biological Resources*, of this PEIR, specifically within Mitigation Measure BIO-21). Following backfilling activities, the areas would be reseeded with native seeds for long-term stability in accordance with Mitigation Measure BIO-5. Post-remediation monitoring would commence as specified in the DTSC-approved cleanup decision documents and O&M plan required by Mitigation Measure HYDRO-2 to ensure that the final regrading of disturbed areas is stabilized and drainage patterns mimic preoperational conditions to the extent practicable.

Conclusion: The overall site cleanup activities would temporarily alter drainage patterns. However, upon completion of excavation activities at the project site, backfilling, and recontouring, drainage patterns would be restored to natural conditions to the extent practicable. There would be no alteration of a stream with the exception of the removal of the earthen dams at the three existing pond locations to reestablish natural drainage patterns, which would be done in accordance with a Section 404 CWA permit, Section 401 WQC, and/or streambed alteration agreement (Mitigation Measure BIO-21). Compliance with the SWPPP required by Mitigation Measure HYDRO-1, O&M plan required by Mitigation Measure HYDRO-2, a revegetation plan required by Mitigation Measure BIO-5, DTSC-approved cleanup decision documents, and any CWA/WQC or streambed alteration agreement (Mitigation Measure BIO-21) permit requirements would reduce impacts related to altering drainage patterns or increasing erosion or siltation. This impact would be less than significant with implementation of Mitigation Measures BIO-5, BIO-21, HYDRO-1, and HYDRO-2.

Impact 4.8-3a Determination: *The* ***overall site cleanup*** *would alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite. Mitigation Measures BIO-5, BIO-21, HYDRO-1, and HYDRO-2 would mitigate this impact. This impact would be* ***less than significant with mitigation incorporated.***

Initial Project Assessment

Impact 4.8-3b: Would implementation of the **initial activities** substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?

Initial Activities (Impact 4.8-3b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities

- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The initial activities described in Section 3.7 would involve soil excavation and disposal, building demolition, and maintenance activities in all four administrative areas. The initial projects would be required to comply with the DTSC-approved cleanup decision documents and implement the BMPs required by a Construction General Permit, also described in Mitigation Measure HYDRO-1, which would require preparation of a SWPPP. The BMPs would be explicitly designed to ensure that drainage patterns are restored to mimic natural drainage conditions to the extent practicable and that erosion and siltation is minimized during the soil excavation activities.

Following completion of soil removal, the excavated areas would be backfilled with clean soil and regraded in accordance with the cleanup decision documents and the SWPPP. The regraded areas would be seeded with native vegetation in accordance with Mitigation Measure BIO-5 and given added soil-stabilization measures (Mitigation Measure HYDRO-1) where necessary to minimize exposed soils susceptibility to erosion. There would be no alteration of a stream with the exception of the removal of the earthen dams at the three existing pond locations to reestablish natural drainage patterns, which would be done in accordance with a Section 404 CWA permit, Section 401 WQC, and/or streambed alteration agreement as required by Mitigation Measure BIO-21. Once earthwork activities are complete, the excavated areas would be stabilized in accordance with the DTSC-approved cleanup decision documents and monitored in accordance with an O&M plan (Mitigation Measure HYDRO-2) for effectiveness to ensure that the potential for erosion is minimized.

> Conclusion: Cleanup activities for the initial activities would include earthwork activities. However, following restorative regrading efforts upon completion of remedial objectives, drainage patterns would be restored to mimic natural drainage patterns. There would be no alteration of a stream with the exception of the removal of the earthen dams at the three existing pond locations to reestablish natural drainage patterns, which would be done in accordance with a Section 404 CWA permit, Section 401 WQC, and/or streambed alteration agreement as required by Mitigation Measure BIO-21. Compliance with the SWPPP required by HYDRO-1, DTSC-approved cleanup decision documents, a revegetation plan required by Mitigation Measure BIO-5, and any CWA/WQC or streambed alteration agreement permit requirements (Mitigation Measure BIO-21) would reduce impacts related to altering drainage patterns or increasing erosion or siltation. This impact would be less than significant with mitigation incorporated.

Impact 4.8-3b Determination: *The **initial activities** would alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation onsite or offsite. Mitigation Measures BIO-5, BIO-21, HYDRO-1, and HYDRO-2 would mitigate this impact. This impact would be **less than significant with mitigation incorporated**.*

4.8.5.4 Runoff and Flooding

Program Assessment

Impact 4.8-4a: Would implementation of the **overall site cleanup** substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite?

Overall Site Cleanup (Impact 4.8-4a)

As described in Impact 4.8-3, the overall site cleanup would not substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river. There would be no alteration of a stream with the exception of the removal of the earthen dams at the three existing pond locations to reestablish natural drainage patterns, which would be done in accordance with a Section 404 CWA permit, Section 401 WQC, and streambed alteration agreement as required by Mitigation Measure BIO-21. In addition, the project site is not located within a flood zone area. The project would remove impervious surfaces through the demolition and removal of facilities. The construction of the soil vapor extraction system would include concrete treatment pads that measure approximately 20 by 25 feet. The use of the portable DOE groundwater treatment system would include an approximately 600-square-foot treatment pad in addition to a 280-square-foot treatment tank. Additional runoff would occur if the pad were placed in a pervious area. In addition, the GETS would require a relatively small concrete pad to house the associated equipment. However, compared to the total area of the project site, these new concrete pads would not represent a substantive increase in impervious surface area that could cause flooding onsite or offsite. Overall, the net effect of the project elements would be a reduction in the extent of impervious surfaces and would not create substantive runoff volumes.

The construction of soil vapor remediation systems and some of the other infrastructure necessary for implementation of the various remediation technologies would not substantially alter the existing drainage patterns such that the rate or amount of surface runoff would cause any flooding onsite or offsite. The majority of the cleanup activities involve substantial earthwork activities related to the removal of impacted soils. These activities would not substantially alter the existing drainage patterns across the site during excavation.

The project would remove the existing earthen dams at the three ponds, and allow surface runoff to occur more closely to predevelopment conditions. The project would create some additional impervious surfaces with the addition of the soil vapor and groundwater treatment pads. However, the removal of impervious surfaces through the demolition and removal of facilities

would result in a net decrease in impervious surfaces and a net increase in areas capable of the infiltration of surface water and recharge of the underlying aquifer. Consequently, the overall site cleanup would not substantially increase the rate or volume of surface runoff and the impact would be less than significant. In addition, the pads for treatment systems and wells would be removed upon completion of cleanup activities, further increasing recharge and reducing runoff.

> Conclusion: The overall site cleanup would result in a net decrease of impervious surfaces, a net increase in recharge, and would not create any substantive flooding. There would be no alteration of a stream or other natural drainage feature with the exception of the removal of the earthen dams at the three existing pond locations to reestablish natural drainage patterns, which would be done in accordance with a Section 404 CWA permit, Section 401 WQC, and/or streambed alteration agreement as required by Mitigation Measure BIO-21 This impact would be less than significant with mitigation incorporated.

Impact 4.8-4a Determination: *The **overall site cleanup** could substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite. Implementation of Mitigation Measure BIO-21 would mitigate this impact. This impact would be **less than significant with mitigation incorporated.***

Initial Project Assessment

Impact 4.8-4b: Would implementation of the **initial activities** substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite?

Initial Activities (Impact 4.8-4b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The initial activities described in Section 3.7 would involve soil excavation and disposal, building demolition, and maintenance activities in all four administrative areas. The initial activities would

not create any additional surface runoff during excavation and could even provide some temporary capture and infiltration of runoff. No impacts to streambeds or other natural drainage features are anticipated for the initial projects. However, as discussed for the overall project, Mitigation Measure BIO-21 would require that potential disturbance to streambeds or natural drainage features would be done in accordance with a Section 404 CWA permit, Section 401 WQC, and streambed alteration agreement as applicable. As a result, the short-term effects of these cleanup projects would not substantially increase the rate or volume of surface runoff. Once complete, there would be no introduction of new impervious surfaces associated with this cleanup project and thus there would be no increase in the rate or volume of stormwater runoff.

> Conclusion: The initial activities would not create new sources of stormwater runoff. There would be no increase in the rate or volume of runoff that could cause flooding onsite or offsite. The initial activities are not anticipated to disturb streambeds or other natural drainage features. However, Mitigation Measure BIO-21 would require that potential disturbance of streambeds or natural drainage features would be done in accordance with a Section 404 CWA permit, Section 401 WQC, and/or streambed alteration agreement as applicable. This impact would be less than significant with mitigation incorporated.

Impact 4.8-4b Determination: *The **initial activities** would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite. Mitigation Measure BIO-21 would ensure that potential disturbance of streambeds or natural drainage features would be done in accordance with a Section 404 CWA permit, Section 401 WQC, and/or streambed alteration agreement as applicable. This impact would be **less than significant with mitigation incorporated**.*

4.8.5.5 Stormwater Drainage and Pollution

Program Assessment

Impact 4.8-5a: Would implementation of the **overall site cleanup** create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Overall Site Cleanup (Impact 4.8-1a)

As previously noted, the proposed remediation technologies for the site include relatively minor new impervious surfaces (e.g., soil vapor treatment pads, DOE portable treatment system, injection well pad) and a larger net decrease in impervious surfaces from the demolition and removal of facilities. As a result, there would be no substantive increase in the amount of stormwater flow, which mostly occurs as overland sheet flow at the project site; instead, there would be a net increase in onsite infiltration and recharge of stormwater. The earthen dams at the existing pond locations may be removed to reestablish natural drainage patterns and would be conducted in accordance with a Section 404 CWA permit, Section 401 WQC, and/or streambed

alteration agreement as required by Mitigation Measure BIO-21. The removal of these earthen dams would not be expected to result in polluted runoff, significant erosion, or sedimentation downstream because implementation of the SWPPP (Mitigation Measure HYDRO-1) and Mitigation Measure BIO-21 would require implementation of stormwater and erosion control BMPs.

Stormwater flows would eventually drain into Bell Creek. Removal of the earthen dams and associated ponds may require a permit from the Ventura County Watershed Protection District due to impacts to peak flows downstream. To obtain the permit an engineering study must be prepared to demonstrate that removal of the earthen dams and ponds would not exceed the conveyance capacity of Bell Creek.

The operation of the GETS would result in the generation of treated water. However, the treated water would be either injected back into the aquifer in the proposed Injection Well IN-1 or discharged to one of the existing surface water outfalls, most likely Outfall 019 or 020 (see Figure 3-8 for well and outfall locations). Discharge to the NPDES outfall would be completed in accordance with the existing NPDES Permit No. CA0001309, which would include limitations on quantities and rates as well as water quality. No other conditions under the overall site cleanup would provide substantial additional sources of polluted runoff (see also discussion of water quality under Impact 4.8-1). Therefore, the potential impacts related to the capacity of planned drainage systems or additional sources of polluted runoff would be less than significant.

In addition, earthwork activities would be required to comply with the Construction General Permit, which requires the implementation of BMPs to eliminate or reduce the discharge of pollutants in stormwater and cleanup activity-related non-stormwater discharges. Under the Construction General Permit and Mitigation Measure HYDRO-1, the project would be required to prepare a SWPPP and implement BMPs detailed in the SWPPP during cleanup activities. The BMPs specified in the SWPPP would be designed to minimize erosion and sedimentation and prevent spills using silt fences around soil piles, tarps/covers for soil piles, and gravel bag berms along temporary flow paths to control and minimize erosion and sedimentation, among other measures. The SWPPP would identify the following: equipment storage, cleaning and maintenance areas/activities; points of ingress and egress to the site; material loading, unloading, and storage practices and areas, including building and waste materials; and materials, equipment, or vehicles that may come in contact with stormwater. In addition, Mitigation Measure BIO-5 requires soil-stabilization BMPs and prescribes appropriate restoration measures in accordance with a site-specific revegetation plan, and a soil management plan. In addition, Mitigation Measure HYDRO-2 requires monitoring the effectiveness of the implemented remedial actions and groundwater and soil monitoring. With implementation of Mitigation Measures BIO-5, HYDRO-1, and HYDRO-2 impacts related to the capacity of drainage systems or other sources of polluted runoff during cleanup activities would be less than significant.

> Conclusion: The overall site cleanup would create new sources of stormwater runoff. Discharged water would be in accordance with NPDES permit requirements, which would include limitations on water quality and quantity. As such, there would be no

increase in the rate or volume of runoff that could exceed the capacity of the existing or planned drainage system and no other sources of polluted runoff would be created. With implementation of Mitigation Measures BIO-5, BIO-21. HYDRO-1, and HYDRO-2, this impact would be less than significant with mitigation incorporated.

Impact 4.8-5a Determination: *The* ***overall site cleanup*** *would create new sources of stormwater runoff or sources of polluted runoff. This impact would be* ***less than significant*** *with implementation of Mitigation Measures BIO-5, BIO-21, HYDRO-1, and HYDRO-2.*

Initial Project Assessment

Impact 4.8-5b: Would implementation of the **initial activities** create or contribute runoff water, which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Initial Activities (Impact 4.8-5b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The initial activities described in Section 3.7 would involve soil excavation and disposal, building demolition, and maintenance activities in all four administrative areas. The initial activities would not create any additional surface runoff during cleanup activities. As a result, the short-term effects of these initial activities would not exceed existing or planned stormwater drainage systems. Earthwork activities would be required to comply with the Construction General Permit, which requires the implementation of BMPs to eliminate or reduce the discharge of pollutants in stormwater and cleanup activity-related non-stormwater discharges. Under the Construction General Permit, the project would be required to prepare a SWPPP and implement BMPs detailed in the SWPPP during cleanup activities. The SWPPP is also required under Mitigation Measure HYDRO-1. The BMPs specified in the SWPPP would be designed to minimize erosion and sedimentation and prevent spills using silt fences around soil piles, tarps/covers for soil piles, and gravel bag berms along temporary flow paths to control and minimize erosion and sedimentation, among other measures. The SWPPP would identify the following: equipment storage; cleaning and maintenance areas/activities; points of ingress and egress to the site; material loading,

unloading, and storage practices and areas, including building, and waste materials; and materials, equipment, or vehicles that may come in contact with stormwater. In addition, Mitigation Measure BIO-5 requires soil-stabilization BMPs and prescribes appropriate restoration measures in accordance with a site-specific revegetation plan, and a soil management plan. In addition, Mitigation Measure HYDRO-2 requires monitoring the effectiveness of the implemented remedial actions and groundwater and soil monitoring. With implementation of Mitigation Measures BIO-5, HYDRO-1, and HYDRO-2 and the Construction General Permit, impacts related to the capacity of drainage systems or other sources of polluted runoff during cleanup activities would be less than significant.

Once the excavation and backfilling is complete, there would be no introduction of new impervious surfaces associated with this cleanup project; thus, there would be no increase in the rate or volume of stormwater runoff.

> Conclusion: The initial activities would create new sources of stormwater runoff. Discharged water would be in accordance with NPDES permit requirements, which would include limitations on water quality and quantity and Mitigation Measures BIO-5, HYDRO-1, and HYDRO-2. As such, there would be no increase in the rate or volume of runoff that could exceed the capacity of the existing or planned drainage system and no other sources of polluted runoff would be created. This impact would be less than significant with mitigation incorporated.

Impact 4.8-5b Determination: *The* ***initial activities*** *would create new sources of stormwater runoff or sources of polluted runoff. Implementation of Mitigation Measures BIO-5, HYDRO-1, and HYDRO-2 would mitigate this impact. This impact would be* ***less than significant with mitigation incorporated.***

4.8.6 Mitigation Measures

The following measures shall be implemented to mitigate impacts related to hydrology and water quality:

AQ-3: Soil Management Plan (see Section 4.2.6 for description).

BIO-5: Revegetation Plan (see Section 4.3.6 for description).

BIO-21: Jurisdictional Wetlands and Waters (see Section 4.3.6 for description).

HAZ-3: Hazardous Materials Business Plan (see Section 4.7.6 for description).

HYDRO-1: Stormwater Pollution Prevention Plan (SWPPP). Site activities shall take place in accordance with the statewide General Permit for Stormwater Discharges Associated with Construction Activity (Order No. 2009-0009-DWQ [NPDES No. CAS000002]). As required by this permit and prior to implementation of remediation activities, the RPs shall submit a Notice of Intent, followed by submission of a SWPPP to the LARWQCB for their review. The SWPPP would specify site-specific BMPs to

address and protect stormwater runoff and to minimize erosion during cleanup activities. The BMPs typically include silt fences, sand bags, straw waddles, fiber rolls, stockpile management, spill prevention and control, dewatering runoff controls, containment for chemical storage areas, equipment decontamination procedures, and the use of protective sheeting or tarps prior to a rain event on steep slopes. BMPs shall minimize erosion from destabilization of disturbed surfaces. The RPs shall continue monitoring drainages for increased sediment load and contaminants in accordance with the existing NPDES Permit No. CA0001309 (also referred to under LARWQCB Order R4-2015-0033) during each RP's remediation activities.

HYDRO-2: Operations and Maintenance Plan (O&M Plan). To monitor the effectiveness of the implemented remedial actions, groundwater, surface water, and soil monitoring shall be performed consistent with a DTSC-approved O&M Plan. The groundwater-monitoring portion of the O&M Plan shall consist of monitoring and sampling of wells. New monitoring wells shall be constructed in accordance with the California DWR Well Standards Bulletin 74-90, Ventura County Well Ordinance 4184, and the 2014 DTSC Well Design and Construction for Monitoring Groundwater at Contaminated Sites. Reports shall be prepared and submitted to DTSC that present the monitoring and sampling results and, as necessary, recommendations for modifications to the monitoring program, or additional remedial actions.

Post-remediation monitoring requirements for soil corrective actions may consist of periodic inspections to monitor permanent caps or covers (if used) and periodic sampling to assess soil concentrations following natural degradation processes (if selected).

4.8.7 Impact Summary

Table 4.8-2 summarizes the overall site cleanup and initial activities impacts and significance determinations related to hydrology and water quality.

TABLE 4.8-2
SUMMARY OF IMPACTS – HYDROLOGY AND WATER QUALITY

Impact	Overall Project	DOE Initial Project	NASA Initial Project	DOE Demolition Activities	RCRA Post-Closure and Hazardous Waste Facility Closure	Mitigation Measures
Impact 4.8-1a: Water quality standards and waste discharge requirements	LSM	--	--	--	--	AQ-3, BIO-5, HAZ-3, HYDRO-1, HYDRO-2
Impact 4.8-1b: Water quality standards and waste discharge requirements	--	LSM	LSM	LSM	LSM	AQ-3, BIO-5, HAZ-3, HYDRO-1, HYDRO-2
Impact 4.8-2a: Groundwater supplies and recharge	LTS	--	--	--	--	None
Impact 4.8-2b: Groundwater supplies and recharge	--	LTS	LTS	LTS	LTS	None
Impact 4.8-3a: Alteration of drainage patterns resulting in erosion or siltation	LSM	--	--	--	--	BIO-5, BIO-21, HYDRO-1, HYDRO-2
Impact 4.8-3b: Alteration of drainage patterns resulting in erosion or siltation	--	LSM	LSM	LSM	LSM	BIO-5, BIO-21, HYDRO-1, HYDRO-2
Impact 4.8-4a: Alteration of drainage patterns resulting in flooding	LSM	--	--	--	--	BIO-21
Impact 4.8-4b: Alteration of drainage patterns resulting in flooding	--	LSM	LSM	LSM	LSM	BIO-21
Impact 4.8-5a: Exceed stormwater drainage capacities or provide additional polluted runoff	LSM	--	--	--	--	BIO-5, BIO-21 HYDRO-1, HYDRO-2
Impact 4.8-5b: Exceed stormwater drainage capacities or provide additional polluted runoff	--	LSM	LSM	LSM	LSM	BIO-5, BIO-21, HYDRO-1, HYDRO-2

LTS = Less than significant
LSM = Less than significant with mitigation incorporated

4.9 Land Use and Planning

This section describes the existing site conditions, surrounding land uses, existing zoning and general plan designations, plans, and policies. This section also provides an analysis of potential land use impacts resulting from implementation of the overall site cleanup and initial activities. Mitigation measures, as necessary, are presented in Section 4.9.6.

4.9.1 Environmental Setting

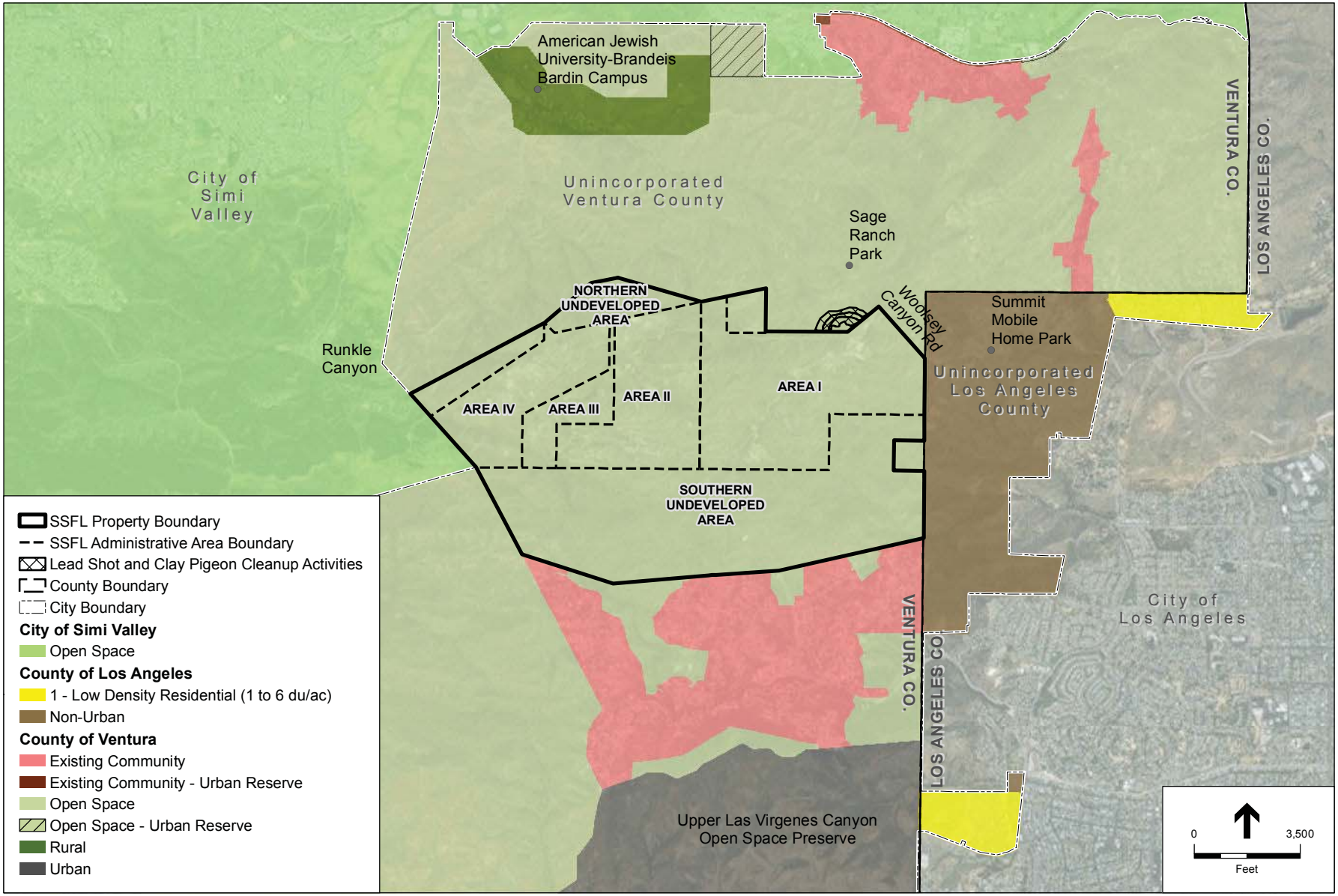
4.9.1.1 Site Conditions

The project site is in an unincorporated area in southeastern Ventura County. **Figures 4.9-1** and **4.9-2** show the General Plan–designated land uses and zoning at the project site. The entire site is designated as Open Space (OS) in the Ventura County General Plan and zoned Rural Agricultural (RA-5) (Administrative Areas I through IV), Open Space (OS-160) (Northern and Southern Undeveloped Areas), and Agricultural Exclusive (AE-40 ac) (former Sage Ranch recreational trap and target shooting range). The designation and zones are described as follows in the Ventura General Plan and the Ventura County Non-Coastal Zoning Ordinance.

On April 24, 2017, Boeing filed a conservation easement for its portion of SSFL. The easement's purpose is to have the North American Land Trust manage and maintain the property consistent with preserving, protecting, and maintaining in perpetuity the property's Conservation Values. The easement's Conservation Values include the area's habitat, open space, cultural resources, and scenic, educational, scientific, and recreational values. The easement further refines its purpose to include the primary purposes (habitat, open space, and cultural resources) and, to the extent consistent with primary purposes, other conservation values (e.g., scenic, historic, educational, scientific, and recreational).

The volume estimates for the Boeing cleanup provided in this PEIR represent a high volume estimate of soil and sediment requiring remediation. DTSC developed the estimate based on the Suburban Residential risk scenario and 25 percent garden uptake standard. Additional detail on assumptions and calculations may be found in Appendix K. Further characterization and analysis may result in adjustments to these volume estimates; final soil volumes will be provided in the final cleanup decision documents.

The PEIR analyzes the environmental impacts of the most extensive set of cleanup activities evaluated and proposed for the Boeing project, Suburban Residential use with garden consumption of 25 percent of total diet. The PEIR's analysis captures the environmental impacts of a cleanup for less intensive future land use scenarios that could result in removal of less soil and sediment from the project site, a smaller project footprint, and a shorter project duration.

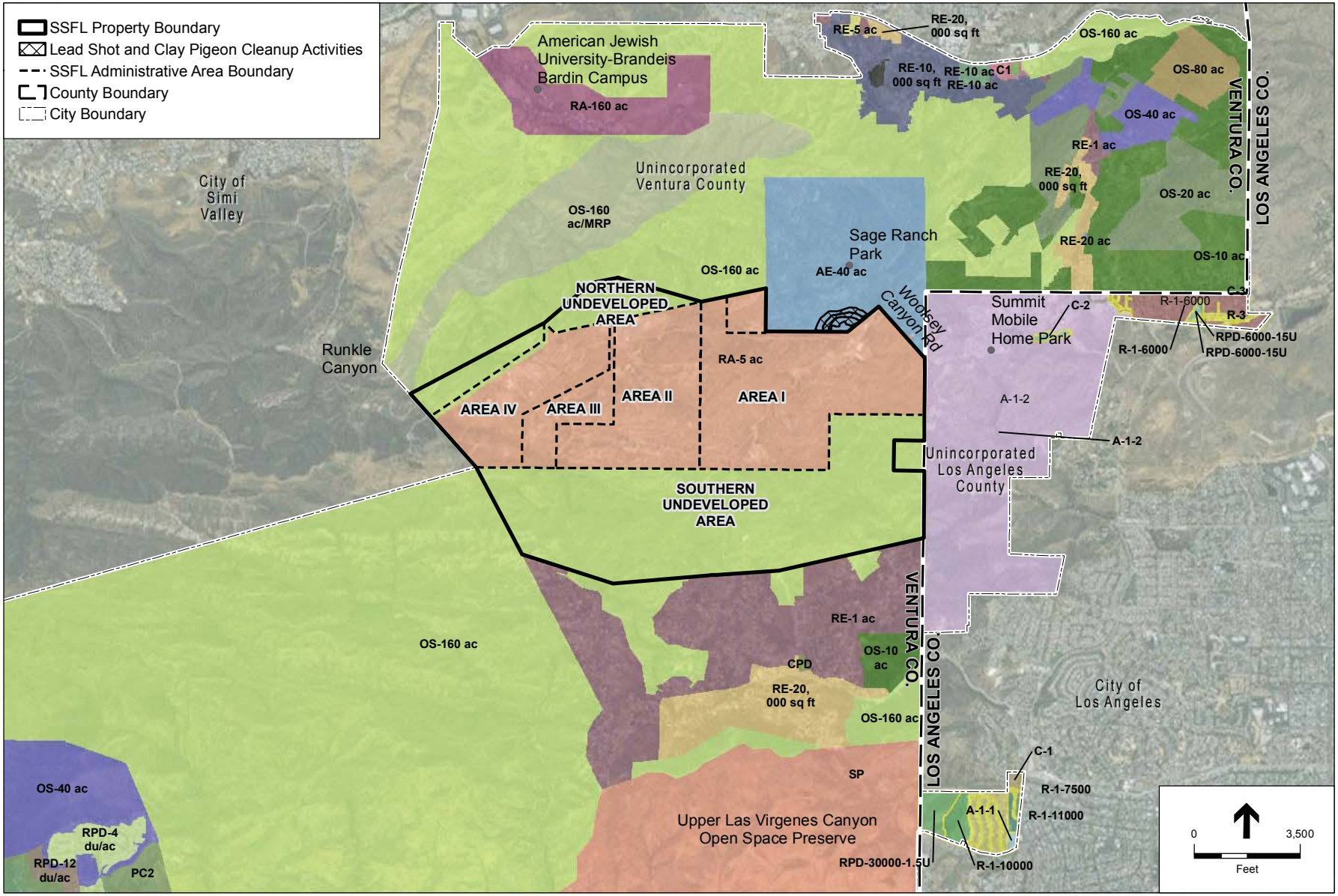


SOURCE: County of Los Angeles; County of Ventura

Santa Susana Field Laboratory

Figure 4.9-1

General Plan Designated Land Use



SOURCE: County of Los Angeles; County of Ventura

Santa Susana Field Laboratory

Figure 4.9-2

Zoning

Applicable Ventura County General Plan Designation

Open Space (OS): This designation encompasses any parcel or area of land or water which is essentially undeveloped for human use and devoted to an open space use, such as the preservation of natural resources, managed production of resources, outdoor recreation, and preservation of public health and safety.

Ventura County Non-Coastal Zones

Agricultural (RA-5): The purpose of this zone is to provide for and maintain a rural setting where a wide range of agricultural uses are permitted while surrounding residential land uses are protected.

Agricultural Exclusive (AE-40 ac): The purpose of this zone is to preserve and protect commercial agricultural lands as a limited and irreplaceable resource, to preserve and maintain agriculture as a major industry in Ventura County and to protect these areas from the encroachment of nonrelated uses which, by their nature, would have detrimental effects upon the agriculture industry.

Open Space (OS-160): The purpose of this zone is to provide for any of the following on parcels or areas of land or water that are essentially unimproved:

a. The preservation of natural resources including, but not limited to: areas required for the preservation of plant and animal life, including habitat for fish and wildlife species; areas required for ecologic and other scientific study purposes; rivers, streams, bays and estuaries; and, coastal beaches, lakeshores, banks of rivers and streams, and watershed lands.

b. The managed production of resources, including but not limited to: forest lands, rangeland, agricultural lands and areas of economic importance for the production of food or fiber; areas required for recharge of groundwater basins; bays, estuaries, marshes, rivers and streams which are important for the management of commercial fisheries; and, areas containing major mineral deposits, including those in short supply.

c. Outdoor recreation, including but not limited to: areas of outstanding scenic, historic and cultural value; areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, and rivers and streams; and, areas which serve as links between major recreation and open-space reservations, including utility easements, banks of rivers and streams, trails, and scenic highway corridors.

d. The public health and safety, including, but not limited to areas which require special management or regulation because of hazardous or special conditions such as earthquake fault zones, unstable soil areas, flood plains, watersheds, areas presenting high fire risks, areas required for the protection of water quality and water reservoirs and areas required for the protection and enhancement of air quality.

e. The formation and continuation of cohesive communities by defining the boundaries and by helping to prevent urban sprawl.

f. The promotion of efficient municipal services and facilities by confining urban development to defined development areas.

g. Support of the mission of military installations that comprises areas adjacent to military installations, military training routes, and underlying restricted airspace that can provide additional buffer zones to military activities and complement the resource values of the military lands.

h. The protection of places, features, and objects described in Sections 5097.9 and 5097.993 of the Public Resources Code.

The project site is composed of areas of open space, much of which is in an undisturbed natural condition, and developed areas that include roads, buildings, and other infrastructure associated with its past use as a scientific research and test facility. The SSFL site is not open to the public and is no longer used as a research facility. Existing activities that occur at the project site include ongoing investigation and monitoring of soil and groundwater contamination, and operation of surface and groundwater treatment systems (see Sections 3.4.2.8 and 3.4.2.9 for descriptions of these systems). In addition, guided tours are conducted at the site by Boeing a couple of times each year, highlighting the site's historical uses and existing biological resources.

4.9.1.2 Ventura County Zoning Compatibility and Consistency

During development of this PEIR, DTSC solicited input from Ventura County regarding the general plan designation and zoning classifications for the subject site. The CERCLA process (as described in Chapter 2.0, *Introduction*, of this PEIR) requires that any reasonably anticipated land uses be evaluated. As shown in the General Plan Zoning Compatibility Matrix (**Table 4.9-1**), the current RA-5 zoning is not consistent with the General Plan OS designation. The General Plan OS designation is compatible with the OS -160 and AE-40 zones.

These zoning classifications accommodate a broad range of land use types, including residential, agricultural and animal husbandry uses as shown in **Table 4.9-2**. Therefore, the wide variety of land uses accommodated by the General Plan OS designation and the OS-160 and AE-40 zones must be considered as reasonably anticipated and examined as part of the CEQA and cleanup process.

4.9.1.3 Surrounding Area Land Uses and Zoning

The project site is surrounded by open space and the cities and residential neighborhoods of: (1) Simi Valley to the north and northwest; (2) Bell Canyon to the south; and (3) Canoga Park and Chatsworth to the east and northeast, respectively (see Figure 3-1). The following provides a more detailed description of the surrounding land uses and planned land uses and zoning.

Land Uses to the North

The areas located north of the project site are designated as Open Space in the Ventura County General Plan. The nearest development is located northwest of the project site. This development includes a private college (American Jewish University) and is designated as Rural in the Ventura County General Plan. This area is zoned as Rural Agricultural (RA-160 ac). A portion of the University's Open Space–zoned area also has a Mineral Resource Protection (MRP) overlay. The specific land use permit conditions for American Jewish University indicate that this property contains religious, teaching, and camping facilities.

TABLE 4.9-1
ZONING COMPATIBILITY MATRIX NON-COASTAL ZONES

General Plan Map Land Use Designations	Zone: OS (10 ac min)	AE (40 ac min)	RA (1 ac min)	RE (10,000 sf min)	RO (20,000 sf min)	R1 (6,000 sf min.)	R2 (3,500 sf/DU)	RPD	RHD (20 DU/ac)	SP	TP	CO	C1	CPD	M1	M2	M3	Legend
Open Space (10 ac min.)																		= Not compatible with plan
Agriculture (40 ac min.)																		= Compatible with plan
Rural (2 ac min.)			2 ac	2 ac	2 ac													=Compatible only with zone suffix equal to or more restrictive than that shown
Existing Community																		X = X thousand square feet min. lot size
Urban																		X ac = X acre minimum lot size
State/Federal Facility	40 ac																	X U = X units per acre maximum,

Open Space Interpretations – Open Space Interpretations granted prior to May 17, 1983, and permitting parcel sizes less than those specified in this Plan, shall be considered consistent with this Plan. Furthermore, zoning which is consistent with the purpose and intent of these Open Space Interpretations shall be considered consistent with this Plan.

Source: Ventura County, 2005.

TABLE 4.9-2
ALLOWABLE RESIDENTIAL & AGRICULTURAL USES

	Allowable Uses	AE Zone	OS Zone
Agricultural	Crop and Orchard Production	X	X
	Animal Husbandry (animal raising)	X	X
	Agricultural Contractors' Services and Storage yards and buildings	X	X
Animal Keeping, Non-Husbandry	Horses and Other Equines	X	X
	Kennels/Catteries	X	X
	Equestrian Centers	X	X
Residential	Single Family Dwellings	X	X
	Second Dwelling Units	X	X
	Residential Care Facilities (6 or fewer)	X	X
	Boarding Houses/Bed-and-Breakfast Inns	X	X
	Family Day Care Home	X	X
	Farmworker Dwelling Units	X	X
	Animal Caretaker Dwelling Units	X	X
	Farmworker Housing Complex (Multi-Family)	X	X

Source: Ventura County, 2015.

The adjacent properties located to the northeast are operated by the Santa Monica Mountains Conservancy. One of these properties is Sage Ranch Park. Both properties are zoned Agricultural Exclusive (AE-40 ac) according to the Ventura County zoning map and are designated as Open Space in the Ventura County General Plan.

Land Uses to the East

The area east of the project site is located within the Santa Monica Mountains North Area Plan (North Area Plan), which is a component of the Los Angeles County General Plan that provides more focused policies for the regulation of development within the unincorporated area of the Santa Monica Mountains west of the city of Los Angeles and north of the Coastal Zone boundary. The area east of the project site is within the Non-Urban Area land use category of the North Area Plan, which is generally characterized by low-intensity development that does not normally receive urban levels of service. The area is zoned Light Agricultural (A-1), which permits single-family residences, as well as crops and animal-raising/keeping. The nearest development consists of a residential community located approximately one-quarter mile east of the project site boundary in Woolsey Canyon. Approximately 1 mile from the project site, beyond the identified Non-Urban Area, is the Canoga Park neighborhood within the city of Los Angeles. The area closest to the project site within Canoga Park is a residential neighborhood comprised of detached single-family homes.

Land Uses to the South

The area located immediately south of the project site consists of natural, undisturbed open space. The broader area is designated as Existing Community in the Ventura County General Plan with intermittent areas designated as Open Space. The Existing Community designation identifies enclaves located outside of urban-designated areas. The enclave in this area is the rural residential community of Bell Canyon. This Existing Community area is zoned Open Space (OS and OS-160) and Rural Exclusive (RE-1 and RE-20,000), which is intended to provide for and maintain rural residential areas in conjunction with horticultural activities and to provide a limited range of service and institutional uses that are compatible with these rural residential communities. The Bell Canyon community consists primarily of single-family residences on larger lots. Denser residential development begins in the San Fernando Valley about 5 miles southeast of the project site. South of Bell Canyon is an area designated as Open Space in the Ventura County General Plan and zoned Open Space (OS-160). Immediately south of that is the Upper Las Virgenes Canyon Open Space Preserve. The preserve encompasses 5,633 acres, which includes the Ahmanson Ranch property that was purchased in 2003 by the Santa Monica Mountains Conservancy. The Upper Las Virgenes Canyon Open Space Preserve is zoned Specific Plan (SP) and is designated Urban by the Ventura County General Plan.

Land Uses to the West

The area located west of the project site consists of natural, undisturbed open space. The majority of this area is designated as Open Space by the Ventura County General Plan. A portion abuts the Runkle Canyon Specific Plan area located in the city of Simi Valley. This area is currently under development with the Runkle Canyon Residential Project, which includes a mix of residential

uses ranging from estates to more moderate and medium-density single family homes, senior housing, open space and a potential recreational golf course. The portion of the Runkle Canyon Specific Plan that abuts the project site is located within Planning Area 14 and is zoned as Open Space. It is undeveloped and encompasses cattle-grazing areas and a former sand and gravel quarry. The planned development areas are located to the northwest of the project site. Dense residential development occurs northwest of the Runkle Canyon Specific Plan area in the city of Simi Valley.

4.9.2 Regulatory Setting

4.9.2.1 Federal

The National Oil and Hazardous Substances Pollution Contingency Plan, more commonly called the National Contingency Plan or NCP, is the federal government's blueprint for responding to oil spills and hazardous substance releases. The NCP preamble specifically discusses land use assumptions regarding the baseline risk assessment. Land use assumptions affect the exposure pathways that are evaluated in the baseline risk assessment. Current land use is critical in determining whether there is a current risk, and future land use is important in estimating potential future threats. The results of the risk assessment aid in determining the degree of remediation necessary to ensure long-term protection at National Priority List (NPL) sites. The NCP provides for coordination with State and local government entities concerning land use planning with regard to baseline risk assessment and degree of remediation. DTSC follows the NCP process when applying risk assessment and assessing land use. When overseeing cleanup actions that are protective of human health and the environment, consistent with USEPA regulations (OSWER Directive 9355.7-19, March 17, 2010), DTSC considers the reasonably anticipated future land use of the site during the remedy selection process.

4.9.2.2 State

California Code of Regulations, Title 22, Division 4.5

The State of California Code of Regulations (CCR) establishes standards related to toxins and waste disposal. Although these regulations do not specify land uses with respect to various levels of remediation, the reasonably foreseeable land use for a contaminated site is one of the principal variables in risk assessment and determining the ultimate cleanup criteria.

Division 4.5 of Title 22 of the CCR relate to the cleanup and prevention of toxins in soils and water. Chemical contamination exceeding established state standards is considered a health hazard. DTSC oversees the cleanup of soils and groundwater and evaluates soil, water, and air samples taken at contaminated sites. DTSC enforces cleanup of contaminated sites through the implementation of cleanup decision documents, which must comply with requirements specified in Chapter 6.8, Division 20 (commencing with Section 25300) of the California Health and Safety Code, as discussed below. In addition, DTSC regulates the operation and closure of hazardous waste facilities pursuant to Chapter 6.5, Division 20 (commencing with Section 25100) of the California Health and Safety Code.

Under its regulatory authority, DTSC may also limit the types of land use allowed within a particular site, depending on the level of cleanup implemented. This is done in coordination with local agencies to assess the reasonably anticipated land use of the site. Section 67391.1 of the CCR describes land use covenants and recorded instruments restricting the present and future use of a site.

4.9.2.3 Local

Ventura County General Plan

A focused update of the Ventura County General Plan was adopted in 2005. The General Plan is a comprehensive policy document that aids decision-makers in guiding future development in a manner that is consistent with the needs, goals, and interests of the public. It consists of countywide chapters that address the seven elements mandated by the California Government Code, along with a series of Area Plans that set forth more detailed goals, policies, and programs for specific unincorporated communities. The project site is not located within an Area Plan.

The General Plan contains four chapters: Resources, Hazards, and Land Use. The Resources, Hazards and Land Use chapters of the General Plan contain goals and policies that are applicable to the project's potential impacts related to land use and planning.

The following General Plan goals and policies specifically pertain to land use and planning actions. Other goals and policies of the General Plan that are not identified below are discussed throughout Chapter 4.0, *Environmental Setting, Impacts and Mitigation*, of this PEIR within the applicable resource sections (i.e., Sections 4.1 through 4.13).

General Plan Chapter 1—Resources

The Resources chapter of the General Plan contains applicable goals and policies, which are listed under the following major headings: General Goals, Policies, Air Quality, Water Resources, and Biological Resources. The applicable goals and policies that specifically relate to land use and planning are listed below.

General Goals, Policies and Programs

1.1.1.2 Plan for the preservation, conservation, efficient use of, enjoyment of, and access to resources, as appropriate, within Ventura County for present and future generations.

Air Quality Policies

1.2.2.1 Discretionary development that is inconsistent with the Air Quality Management Plan (AQMP) shall be prohibited, unless overriding considerations are cited by the decision-making body.

Water Resources Goals

1.3.1.2 Effectively manage the water resources of the County by adequately planning for the development, conservation and protection of water resources for present and future generations.

Water Resources Policies

1.3.2.1 Discretionary development which is inconsistent with the goals and policies of the County's Water Management Plan (WMP) shall be prohibited, unless overriding considerations are cited by the decision-making body.

Biological Resources Goal

1.5.1 Preserve and protect significant biological resources in Ventura County from incompatible land uses and development. Significant biological resources include endangered, threatened or rare species and their habitats, wetland habitats, coastal habitats, wildlife migration corridors and locally important species/communities.

General Plan Chapter 2-Hazards

The Hazards chapter of the General Plan contains applicable goals and policies, which are listed under the following major headings: Hazardous Materials and Waste and Noise. The applicable goals and policies are listed below.

Hazardous Materials and Waste Policies

2.15.2.3 Any business that handles a hazardous material shall establish a plan for emergency response to a release or threatened release of a hazardous material. The County Fire Protection District is designated as the agency responsible for implementation of this policy.

Noise Policies

2.16.2.1 All discretionary development shall be reviewed for noise compatibility with surrounding uses. Noise compatibility shall be determined from a consistent set of criteria based on the standards listed below. An acoustical analysis by a qualified acoustical engineer shall be required of discretionary developments involving noise exposure or noise generation in excess of the established standards. The analysis shall provide documentation of existing and projected noise levels at on-site and off-site receptors, and shall recommend noise control measures for mitigating adverse impacts.

General Plan Chapter 3—Land Use

The Land Use chapter of the General Plan contains the following applicable goals and policies.

Land Use Goals—Open Space

3.2.1.5(1) Preserve for the benefit of all the County's residents the continued wise use of the County's renewable and nonrenewable resources by limiting the encroachment into such areas of uses which would unduly and prematurely hamper or preclude the use or appreciation of such resources.

3.2.1.5(2) Acknowledge the presence of certain hazardous features which urban development should avoid for public health and safety reasons, as well as for the possible loss of public improvements in these areas and the attendant financial costs to the public.

3.2.1.5(3) Retain open space lands in a relatively undeveloped state so as to preserve the maximum number of future land use options.

3.2.1.5(4) Retain open space lands for outdoor recreational activities, parks, trails and for scenic lands.

3.2.1.5(5) Define urban areas by providing contrasting but complementary areas which should be left generally undeveloped.

3.2.1.5(6) Recognize the intrinsic value of open space lands and not regard such lands as "areas waiting for urbanization."

Land Use Policies—Open Space

3.2.2.5(1) Open Space should include areas of land or water which are set aside for the preservation of natural resources, including, but not limited to, areas required for the preservation of plant and animal life, including habitat for fish and wildlife species; areas required for ecologic and other scientific study purposes; rivers, streams, bays, and estuaries; and coastal beaches, lakeshores, banks of rivers and streams, and important watershed lands.

3.2.2.5(2) Open Space should also include areas set aside for managed production of resources, including, but not limited to, forest lands, rangeland, agricultural lands not otherwise designated Agricultural; areas required for the recharge of groundwater basins; bays, estuaries, marshes, rivers, and streams which are important for the management of commercial fisheries; and areas containing major mineral deposits, including those in short supply.

3.2.2.5(3) Open Space should also include areas within which recreational activities can be pursued, including, but not limited to, areas of outstanding scenic, historic, and cultural value; areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, and rivers and streams; and areas which serve as links between major recreation and open space reservations, including utility easements, banks of rivers and streams, trails, and scenic highway corridors.

3.2.2.5(4) Open Space should also include areas of land or water which are set aside for public health and safety, thereby safeguarding humans and property from certain natural hazards, including, but not limited to, areas which require special management or regulation because of hazardous or special conditions such as earthquake fault zones, unstable soil areas, flood plains, watersheds, areas presenting high fire risks, areas required for the protection of water quality and water reservoirs, and areas required for the protection and enhancement of air quality.

3.2.2.5(5) Open Space should also include undeveloped natural areas surrounding urban-designated areas which have been set aside to define the boundaries of the urban-designated areas, to prevent urban sprawl, and to promote efficient municipal services and facilities by confining the areas of urban development.

3.2.2.5(6) The smallest minimum parcel size consistent with the Open Space land use category is 10 acres. Subzones may require larger minimum parcel sizes.

3.2.2.5(7) The minimum parcel size for Open Space properties contiguous with the Agricultural land use designation shall be 20 acres.

Ventura County Zoning Ordinance

Division 8, Chapter 1, Zoning (Ventura County Code of Ordinances) implements the goals and policies of the Ventura County General Plan by regulating permitted uses for the land within the unincorporated portions of Ventura County. Chapter 1 of the Ordinance describes the purpose of

each zone and provides a description of permitted uses for the various zoning designations within the county, including the project site and development standards.

The project site is zoned as Rural Agriculture (RA-5) (Administrative Area I through IV), Open Space (OS-160) (Northern and Southern Undeveloped Areas), and Agricultural Exclusive (AE-40 ac) (former Sage Ranch recreational trap and target shooting range). The General Plan Zoning Compatibility Matrix, as shown in Table 4.9-1 above, identifies two zones that are compatible with the General Plan land use designation Open Space, including OS-10-acre minimum and AE-40-acre minimum. The RA-5 zone is not considered compatible with the Open Space land use designation. Refer to Section 4.9.1.2 for additional discussion of land use compatibility, general plan consistency and reasonably anticipated land uses.

4.9.3 Thresholds of Significance

For the purposes of this PEIR, DTSC has based the thresholds of significance on the checklist questions regarding land use in Appendix G of the CEQA Guidelines. In addition, Ventura County's Initial Study Assessment Guidelines have been incorporated, as appropriate, into the analysis.

Based on the size and scope of the project and the potential for impacts, the criteria identified below are included for evaluation in this section. Please see Chapter 7.0, *Impacts Found Not to Be Significant*, of this PEIR for a discussion of other issues associated with the evaluation of land use where the characteristics of the project made it clear that effects would not be significant and further evaluation in this section was not warranted.

Would the project:

Impact 4.9-1 Conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect (refer to Impact Statements 4.9-1a and 4.9-1b)?

4.9.4 Methodology

The CEQA analysis of potential land use impacts considers consistency of the project with adopted plans and policies that regulate land use on the project site. CEQA Guidelines Section 15125(d) requires that an EIR discuss inconsistencies with the proposed project and applicable general plans and regional plans. Projects are considered consistent with such land use controls if they are compatible with the general intent of the plans and would not preclude the attainment of their primary goals. Inconsistency with a land use control is not a significant environmental effect unless the inconsistency would result in a significant impact.

4.9.5 Analysis of Project Impacts

The following text describes the potential environmental impacts related to land use associated with implementing the overall site cleanup and initial activities, demarcated as impact "a" and "b" respectively. As presented in Section 3.7, *Initial Activities*, of this PEIR, these activities include eight different projects. Depending on the degree to which impacts of the initial activities would be similar to or different from each other, the impact analysis for the initial activities for some thresholds has been combined accordingly (i.e., the number of separate discussions for impact for each threshold ranges from one to eight). Each impact discussion concludes with a significance determination.

4.9.5.1 Conflicts with Land Use Plans, Policies or Regulations

Program Assessment

Impact 4.9-1a: Would implementation of the proposed **overall site cleanup** conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect?

Overall Site Cleanup (Impact 4.9-1a)

The proposed project involves soil and groundwater remediation activities, including demolition of some existing onsite facilities. As explained in Section 3.6, *Overall Site Cleanup*, of this PEIR, future development of the site is not part of the proposed project and is not evaluated in this PEIR. The 2010 AOCs and 2007 Consent Order only require cleanup of the site. Any future development of the site would be subject to other discretionary actions by the County of Ventura or other government agencies (which may include DTSC under certain circumstances), including environmental review as appropriate pursuant to CEQA.

The Ventura County Zoning Ordinance zones the site as Rural Agriculture (RA-5) (Administrative Areas I through IV), Open Space (OS-160) (Northern and Southern Undeveloped Areas), and Agricultural Exclusive (AE-40) (former Sage Ranch recreational trap and target shooting range). The proposed project would not change the current use of the site and the proposed cleanup level would not conflict with the allowable uses identified for the RA-5, AE-40 and OS-160 zones. The project does not include development or land use changes. Any future development of the project site would be subject to a separate environmental review and applicable local laws and ordinances.

A comparison of the project with applicable policies of the Ventura County General Plan is provided in **Table 4.9-3**. As shown, the project would be consistent with all of the applicable goals and policies of the General Plan with the exception of Biological Resources Goal 1.5.1 and Land Use Policies – Open Space 3.2.2.5(1).

TABLE 4.9-3
LAND USE CONSISTENCY WITH APPLICABLE VENTURA COUNTY GENERAL PLAN GOALS AND POLICIES

General Plan Goals and Policies	Project Consistency Discussion
General Plan Chapter 1—Resources	
General Goals, Policies and Programs	
1.1.1.2 Plan for the preservation, conservation, efficient use of, enjoyment of, and access to resources, as appropriate, within Ventura County for present and future generations.	Consistent. The project does not propose to change the use of the site. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. This would improve site conditions and enhance the potential for preservation, conservation, efficient use and enjoyment for future generations. The project would not conflict with this policy.
Air Quality Policies	
1.2.2 1 Discretionary development that is inconsistent with the Air Quality Management Plan (AQMP) shall be prohibited, unless overriding considerations are cited by the decision-making body.	Consistent. As discussed under Impacts 4.2-1a and 4.2-1b in Section 4.2, *Air Quality*, of this PEIR, the overall site cleanup and initial activities would be inconsistent with the VCAPCD's and SCAQMD's AQMPs, because the overall site cleanup and initial activities emissions would exceed the regulatory thresholds for NOx and ROG within the applicable Air District; however, once the cleanup activities have been completed, site activities (e.g., monitoring) would not exceed the regulatory thresholds. Therefore, the project would be consistent with this policy once the soil excavation activities are complete and would not preclude attainment of this policy. In the short term, excavation and soil removal activities would result in a significant and unavoidable impact, even with the implementation of mitigation measures. No additional feasible mitigation is available.
Water Resources Goals	
1.3.1.2 Effectively manage the water resources of the County by adequately planning for the development, conservation and protection of water resources for present and future generations.	Consistent. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. As discussed under Impacts 4.8-1a and 4.8-1b in Section 4.8, *Hydrology and Water Quality*, of this PEIR, all facets of the project that involve the potential discharge or transport of pollutants would be closely monitored and designed to minimize the potential to violate any water quality standards or discharge requirements. All excavation work would be completed in accordance with the DTSC-approved cleanup decision documents, the Construction General Permit and Mitigation Measures AQ-3, BIO-5, HYDRO-1, HYDRO-2, and HAZ-3, to limit exposure of soils and reduce the potential for discharging pollutants. This would ensure that water resources are effectively managed, conserved and protected for present and future generations. The project would be consistent with this policy.

General Plan Goals and Policies	Project Consistency Discussion
Water Resources Policies	
1.3.2.1 Discretionary development which is inconsistent with the goals and policies of the County's Water Management Plan (WMP) shall be prohibited, unless overriding considerations are cited by the decision-making body.	Consistent. The Ventura County WMP contains goals and policies concerning water supply, water demand management and water quality issues. As discussed under Impacts 4.8-1a and 4.8-1b in Section 4.8, *Hydrology and Water Quality*, of this PEIR, the overall site cleanup and initial activities would not use large quantities of water for dust control from existing onsite water supply wells. When cleanup activities are complete, water use would be further reduced and used for mainly for ongoing monitoring activities. Therefore, it is anticipated that the project would not be in conflict with the WMP water supply and water demand management goals and policies. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. As a result, all facets of the project that involve the potential discharge or transport of pollutants would be closely monitored and designed to minimize the potential to violate any water quality standards or discharge requirements. All excavation work would be completed in accordance with the DTSC-approved cleanup decision documents, the Construction General Permit and Mitigation Measures AQ-3, BIO-5, HYDRO-1, HYDRO-2, and HAZ-3, to limit exposure of soils and reduce the potential for discharging pollutants. This would ensure that the project would not conflict with the WMP goals and policies related to water quality issues and be consistent with this policy.
Biological Resources Goal	
1.5.1 Preserve and protect significant biological resources in Ventura County from incompatible land uses and development. Significant biological resources include endangered, threatened or rare species and their habitats, wetland habitats, coastal habitats, wildlife migration corridors and locally important species/communities.	**Inconsistent.** The overall site cleanup and initial activities would result in the removal of native vegetation and soil and would adversely affect sensitive/special status plants, wildlife, and habitat (see Section 4.3, *Biological Resources,* of this PEIR). Therefore, the project would be inconsistent with this policy for preserving and protecting biological resources. This would result in a significant and unavoidable impact even with implementation of Mitigation Measures BIO-1 through BIO-23. No additional feasible mitigation is available.
General Plan Chapter 2—Hazards	
Hazardous Materials and Waste Policies	
2.15.2.3 Any business that handles a hazardous material shall establish a plan for emergency response to a release or threatened release of a hazardous material. The County Fire Protection District is designated as the agency responsible for implementation of this policy.	Consistent. Implementation of the overall site cleanup and initial activities requires preparation of a Hazardous Materials Business plan in accordance with the California Hazardous Materials Release Response Plans and Inventory Law of 1985 (Business Plan Act). In addition, Mitigation Measure HAZ-3 requires preparation of hazardous materials business plans and disclosure of inventories, including an inventory of hazardous materials handled, plans showing where hazardous materials are stored, an emergency response plan, and provisions for employee training in safety and emergency response procedures. Refer to Section 4.7, *Hazards and Hazardous Materials*, of this PEIR for details. The project would be consistent with this policy.

General Plan Goals and Policies	Project Consistency Discussion
Noise Policies	
2.16.2.1 All discretionary development shall be reviewed for noise compatibility with surrounding uses. Noise compatibility shall be determined from a consistent set of criteria based on the standards listed in the general plan. An acoustical analysis by a qualified acoustical engineer shall be required of discretionary developments involving noise exposure or noise generation in excess of the established standards. The analysis shall provide documentation of existing and projected noise levels at on-site and off-site receptors, and shall recommend noise control measures for mitigating adverse impacts.	Consistent. As discussed under Impacts 4.10-1a and 4.10-1b, in Section 4.10, *Noise*, of this PEIR, an acoustical analysis has been prepared and the overall site cleanup and initial activities would not generate noise levels that would exceed the applicable noise standards established by Ventura County, with implementation of Mitigation Measure NOISE-1. Therefore, the project would be consistent with this policy.
General Plan Chapter 3—Land Use	
Land Use Goals—Open Space	
3.2.1.5(1) Preserve for the benefit of all the County's residents the continued wise use of the County's renewable and nonrenewable resources by limiting the encroachment into such areas of uses which would unduly and prematurely hamper or preclude the use or appreciation of such resources.	Consistent. The project does not propose to change the use of the site. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. These activities would ultimately improve the condition of the project site through removal of contamination and built environment infrastructure. Therefore, project implementation would not limit encroachment and would not hamper or preclude use or appreciation of any renewable or nonrenewable resources in the project area. The overall site cleanup and initial activities would not conflict with this policy.
3.2.1.5(2) Acknowledge the presence of certain hazardous features which urban development should avoid for public health and safety reasons, as well as for the possible loss of public improvements in these areas and the attendant financial costs to the public.	Consistent. The project does not propose to change the use of the site. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. Therefore, the project would remediate the existing hazardous features on the site and would be consistent with this policy.
3.2.1.5(3) Retain open space lands in a relatively undeveloped state so as to preserve the maximum number of future land use options.	Consistent. The project does not propose to change the use of the site. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. The project would not result in new development that would limit open space in the County and would not conflict with this policy.
3.2.1.5(4) Retain open space lands for outdoor recreational activities, parks, trails and for scenic lands.	Consistent. The project does not propose to change the use of the site. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. The remediation activities would improve site conditions and enhance its potential suitability for outdoor recreational activities (though the project does not propose to change the use of the site) and for scenic lands. The project would not conflict with this policy.

General Plan Goals and Policies	Project Consistency Discussion
3.2.1.5(5) Define urban areas by providing contrasting but complementary areas which should be left generally undeveloped.	Consistent. The project does not propose to change the use of the site. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. This project site, which includes open space, provides contrast with surrounding residential development. The proposed project would not conflict with this policy
3.2.1.5(6) Recognize the intrinsic value of open space lands and not regard such lands as "areas waiting for urbanization."	Consistent. The project does not propose to change the use of the site. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. No future urbanized use of the site is contemplated as part of the project and therefore the project is consistent with this policy.
Land Use Goals—State and Federal Facilities	
3.2.1.6(2) Encourage proper planning of governmental lands so that uses on these lands are compatible with existing and planned uses on adjacent privately owned lands	Consistent. The project does not propose to change the use of the site. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. No future use of the site is contemplated as part of the project. The remediation activities would improve site conditions, which would be compatible with existing and planned uses on adjacent privately owned lands and therefore the project is consistent with this policy.
Land Use Policies—Open Space	
3.2.2.5(1) Open Space should include areas of land or water which are set aside for the preservation of natural resources, including, but not limited to, areas required for the preservation of plant and animal life, including habitat for fish and wildlife species; areas required for ecologic and other scientific study purposes; rivers, streams, bays, and estuaries; and coastal beaches, lakeshores, banks of rivers and streams, and important watershed lands.	**Inconsistent.** The project does not propose to change the use of the site. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. However, implementation of the project would result in the removal of native vegetation and soil and would adversely affect sensitive/special status plants, wildlife, and habitat (see Section 4.3, *Biological Resources*, of this PEIR). This would be inconsistent with this policy and would result in a significant and unavoidable impact even with implementation of Mitigation Measures BIO-1 through BIO-23. No additional feasible mitigation is available.
3.2.2.5(2) Open Space should also include areas set aside for managed production of resources, including, but not limited to, forest lands, rangeland, agricultural lands not otherwise designated Agricultural; areas required for the recharge of groundwater basins; bays, estuaries, marshes, rivers, and streams which are important for the management of commercial fisheries; and areas containing major mineral deposits, including those in short supply.	Consistent. The project does not propose to change the use of the site. The site is currently not used for the managed production of resources, nor does the proposed project involve the managed production of resources. Some areas of the project site have been previously disturbed and contaminated. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. This would enhance the site's natural resources. The proposed project would not conflict with this policy.

General Plan Goals and Policies	Project Consistency Discussion
3.2.2.5(3) Open Space should also include areas within which recreational activities can be pursued, including, but not limited to, areas of outstanding scenic, historic, and cultural value; areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, and rivers and streams; and areas which serve as links between major recreation and open space reservations, including utility easements, banks of rivers and streams, trails, and scenic highway corridors.	Consistent. The project does not propose to change the use of the site. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. This would improve site conditions and enhance the site's suitability for potential outdoor recreational activities and for scenic lands (though the project does not propose to change the use of the site). The project would not conflict with this policy.
3.2.2.5(4) Open Space should also include areas of land or water which are set aside for public health and safety, thereby safeguarding humans and property from certain natural hazards, including, but not limited to, areas which require special management or regulation because of hazardous or special conditions such as earthquake fault zones, unstable soil areas, flood plains, watersheds, areas presenting high fire risks, areas required for the protection of water quality and water reservoirs, and areas required for the protection and enhancement of air quality.	Consistent. The project does not propose to change the use of the site. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. The project does not involve any activities on areas of land or water that were set aside for public health and safety to safeguard humans and property from natural hazards. The project would not conflict with this policy.
3.2.2.5(5) Open Space should also include undeveloped natural areas surrounding urban-designated areas which have been set aside to define the boundaries of the urban-designated areas, to prevent urban sprawl, and to promote efficient municipal services and facilities by confining the areas of urban development.	Consistent. The project does not propose to change the use of the site. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. The site's open space areas provide contrast with surrounding residential development. The project would not conflict with this policy.
3.2.2.5(6) The smallest minimum parcel size consistent with the Open Space land use category is 10 acres. Subzones may require larger minimum parcel sizes.	Consistent. All existing parcels within the project site are greater than 10 acres in size and the project would not change parcel size. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. The project would not conflict with this policy.
3.2.2.5(7) The minimum parcel size for Open Space properties contiguous with the Agricultural land use designation shall be 20 acres.	Consistent. All existing parcels within the project site are greater than 20 acres in size and none of the project parcels are contiguous with the Agricultural land use designation. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. The project would not conflict with this policy.

As discussed in Table 4.9-2, the overall site cleanup would advance many of the goals and policies associated with the use of the site as open space. However, the project would be inconsistent with General Plan Biological Resources Goal 1.5.1 and Open Space Policy 3.2.2.5(1), which states the following:

> Goal 1.5.1: Preserve and protect significant biological resources in Ventura County from incompatible land uses and development. Significant biological resources include endangered, threatened or rare species and their habitats, wetland habitats, coastal habitats, wildlife migration corridors and locally important species/communities.
>
> > Policy 3.2.2.5(1): Open Space should include areas of land or water which are set aside for the preservation of natural resources, including, but not limited to, areas required for

> the preservation of plant and animal life, including habitat for fish and wildlife species; areas required for ecologic and other scientific study purposes; rivers, streams, bays, and estuaries; and coastal beaches, lakeshores, banks of rivers and streams, and important watershed lands.

The overall site cleanup would be inconsistent with this goal and policy because, as evaluated in Section 4.3, *Biological Resources*, of this PEIR, the project would result in the removal of native vegetation and soil and would adversely affect sensitive/special status plants, wildlife, and habitat. This would result in a significant and unavoidable impact even with implementation of Mitigation Measures AQ-3, BIO-1 through BIO-23, HYDRO-1, HYDRO-2, HAZ-3 and NOISE-1. No additional feasible mitigation is available.

> Conclusion: Implementation of the overall site cleanup would be inconsistent with the Ventura County General Plan. This impact would be significant and unavoidable even with implementation of Mitigation Measures AQ-3, BIO-1 through BIO-23, HYDRO-1, HYDRO-2, HAZ-3 and NOISE-1. No additional feasible mitigation is available.

Impact 4.9-1a Determination: *The* ***overall site cleanup*** *would conflict with applicable land use goals, policies, and regulations. This impact would be* ***significant and unavoidable*** *even with implementation of Mitigation Measures AQ-3, BIO-1 through BIO-23, HYDRO-1, HYDRO-2, HAZ-3 and NOISE-1. No additional feasible mitigation is available.*

Initial Project Assessment

Impact 4.9-1b: Would implementation of the proposed **initial activities** could conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect?

Initial Activities (Impact 4.9-1b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the following projects would be implemented after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The initial activities described in Section 3.7 would involve soil excavation and disposal, DOE building demolition, monitoring and maintenance activities throughout the project site. These activities would not result in the construction of new buildings or modification of existing land uses. The proposed use of the site would not change and therefore would not have the potential to conflict with the RA-5, AE-40 and OS-160 zones. In addition, the proposed cleanup level would not conflict with the allowable uses identified for the RA-5, AE-40 ac and OS-160 zones. However, the initial activities do not include land use changes. Any future development of the project site would be subject to a separate environmental review and applicable local laws and ordinances.

The discussions presented in the General Plan land use consistency analysis presented in Table 4.9-2 are also applicable to the initial activities. As such, these activities would improve environmental conditions and advance many of the Open Space goals and policies of the General Plan. In addition, the proposed cleanup level would be consistent with the allowable uses described for Open Space designated areas in the General Plan. However, the initial activities would also conflict with the VCAPCD's and SCAQMD's AQMPs during the excavation and soil removal activities, as discussed under Impact 4.2-1b in Section 4.2, *Air Quality,* of this PEIR. However, once those activities have been completed, the project would be consistent with General Plan Air Quality Policy 1.2.2 1 (see Table 4.9-3).

The initial activities would be inconsistent with General Plan Biological Resources Goal 1.5.1 and Open Space Policy 3.2.2.5(1) because, as evaluated in Section 4.3, *Biological Resources*, of this PEIR, the initial activities would result in the removal of native vegetation and soil and may adversely affect sensitive/special status plants, wildlife, and habitat. This would result in a significant and unavoidable impact even with implementation of Mitigation Measures BIO-1 through BIO-23. No additional feasible mitigation is available.

> Conclusion: Implementation of the initial activities described in Section 3.7 would be inconsistent with the applicable Ventura County General Plan policies. This impact would be significant and unavoidable even with implementation of Mitigation Measures AQ-3, BIO-1 through BIO-23, HYDRO-1, HYDRO-2, HAZ-3 and NOISE-1. No additional feasible mitigation is available.

Impact 4.9-1b Determination: *The* ***initial activities*** *would conflict with applicable land use goals, policies, and regulations. This impact would be* ***significant and unavoidable*** *even with implementation of Mitigation Measures AQ-3, BIO-1 through BIO-23, HYDRO-1, HYDRO-2, HAZ-3 and NOISE-1. No additional feasible mitigation is available.*

4.9.6 Mitigation Measures

The following measures shall be implemented to mitigate impacts related to land use and planning:

AQ-3: Fugitive Dust Control (see Section 4.2.6 for description).

BIO-1: Critical Habitat and Listed Species Avoidance (see Section 4.3.6 for description).

BIO-2: Worker Environmental Awareness Program Training (see Section 4.3.6 for description).

BIO-3: Braunton's Milk-Vetch (see Section 4.3.6 for description).

BIO-4: Weed Management Plan (see Section 4.3.6 for description).

BIO-5: Revegetation Plan (see Section 4.3.6 for description).

BIO-6: Special-Status Plants (see Section 4.3.6 for description).

BIO-7: Santa Susana Tarplant (see Section 4.3.6 for description).

BIO-8: Vernal Pool Branchiopods (see Section 4.3.6 for description).

BIO-9: Special-Status Invertebrates (see Section 4.3.6 for description).

BIO-10: Western Spadefoot (see Section 4.3.6 for description).

BIO-11: California Red-Legged Frog (see Section 4.3.6 for description).

BIO-12: Wildlife Monitoring (see Section 4.3.6 for description).

BIO-13: Burrowing Owl (see Section 4.3.6 for description).

BIO-14: Least Bell's Vireo (see Section 4.3.6 for description).

BIO-15: Coastal California Gnatcatcher (see Section 4.3.6 for description).

BIO-16: Nesting Avian Species (see Section 4.3.6 for description).

BIO-17: Ringtail (see Section 4.3.6 for description).

BIO-18: Special-Status Bats (see Section 4.3.6 for description).

BIO-19: Sensitive Habitats (see Section 4.3.6 for description).

BIO-20: Seed Collection for Habitat Restoration (see Section 4.3.6 for description).

BIO-21: Jurisdictional Wetlands and Waters (see Section 4.3.6 for description).

BIO-22: Wildlife Movement (see Section 4.3.6 for description).

BIO-23: Tree Protection (see Section 4.3.6 for description).

HAZ-3 Hazardous Materials Business Plan (see Section 4.7.6 for description).

HYDRO-1: Stormwater Pollution Prevention Plan (SWPPP) (see Section 4.8.6 for description).

HYDRO-2: Operations and Maintenance Plan (O&M Plan) (see Section 4.8.6 for description).

4.9.7 Impact Summary

Table 4.9-4 summarizes the proposed project's impacts and significance determinations related to Land Use and Planning.

TABLE 4.9-4
SUMMARY OF IMPACTS – LAND USE AND PLANNING

Impacts	Overall Project	DOE Initial Project	NASA Initial Project	DOE Demolition Activities	RCRA Post-Closure and Facility Closure	Mitigation Measures
Impact 4.9-1a: conflicts with land use plans, policies or regulation	S&U	--	--	--	--	AQ-3, BIO-1 through BIO-23,HAZ-3, HYDRO-1, HYDRO-2, NOISE-1
Impact 4.9-1b: conflicts with land use plans, policies or regulation	--	S&U	S&U	S&U	S&U	AQ-3, BIO-1 through BIO-23,HAZ-3, HYDRO-1, HYDRO-2, NOISE-1

S&U = Significant and unavoidable impact

4.10 Noise

This section evaluates the potential for noise and ground-borne vibration impacts to result from implementation of the overall site cleanup and the initial activities. The environmental setting presents background and terminology with respect to acoustics, and provides a description of the existing noise environment within the vicinity of the project site. The regulatory setting provides a description of applicable federal, state, and local regulatory policies related to noise. The impact assessment section evaluates the potential for the cleanup activities to result in impacts associated with a substantial temporary and/or permanent increase in ambient noise levels in the vicinity of the project site; exposure of people in the vicinity of the project site to excessive noise and ground-borne vibration levels; and whether this exposure is in excess of the applicable noise standards established in the local General Plan or noise ordinance. Feasible mitigation measures intended to reduce impacts to noise and vibration are proposed, where appropriate, to avoid or lessen the significant impacts.

The analysis of impacts in this section was prepared based on review of the Ventura County Construction Noise Threshold Criteria and Control Plan; City of Los Angeles General Plan Noise Element; City of Los Angeles Municipal Code; and available information. Information contained in the *Traffic Study for Simi Valley Santa Susana Field Laboratory EIR* prepared by KOA Corporation (see Appendix H) was used in the modeling of traffic noise exposure. The noise modeling data is included in Appendix I of this PEIR.

4.10.1 Environmental Setting

4.10.1.1 Noise Principles and Descriptors

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air). Noise is generally defined as unwanted sound (i.e., loud, unexpected, or annoying sound). Acoustics is defined as the physics of sound. In acoustics, the fundamental scientific model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determines the sound level and characteristics of the noise perceived by the receiver. Acoustics addresses primarily the propagation and control of sound.

Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) that is measured in decibels (dB), which is the standard unit of sound amplitude measurement. The dB scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound, with 0 dB corresponding roughly to the threshold of human hearing and 120 to 140 dB corresponding to the threshold of pain. Pressure waves traveling through air exert a force registered by the human ear as sound.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude. When all the audible frequencies of a

sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that deemphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to extremely low and extremely high frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements. For this reason, the A-weighted sound level has become the standard descriptor for environmental noise assessment. A range of representative noise sources associated with common indoor and outdoor activities and their corresponding A-weighted noise levels are shown in **Figure 4.10-1**.

4.10.1.2 Noise Exposure and Community Noise

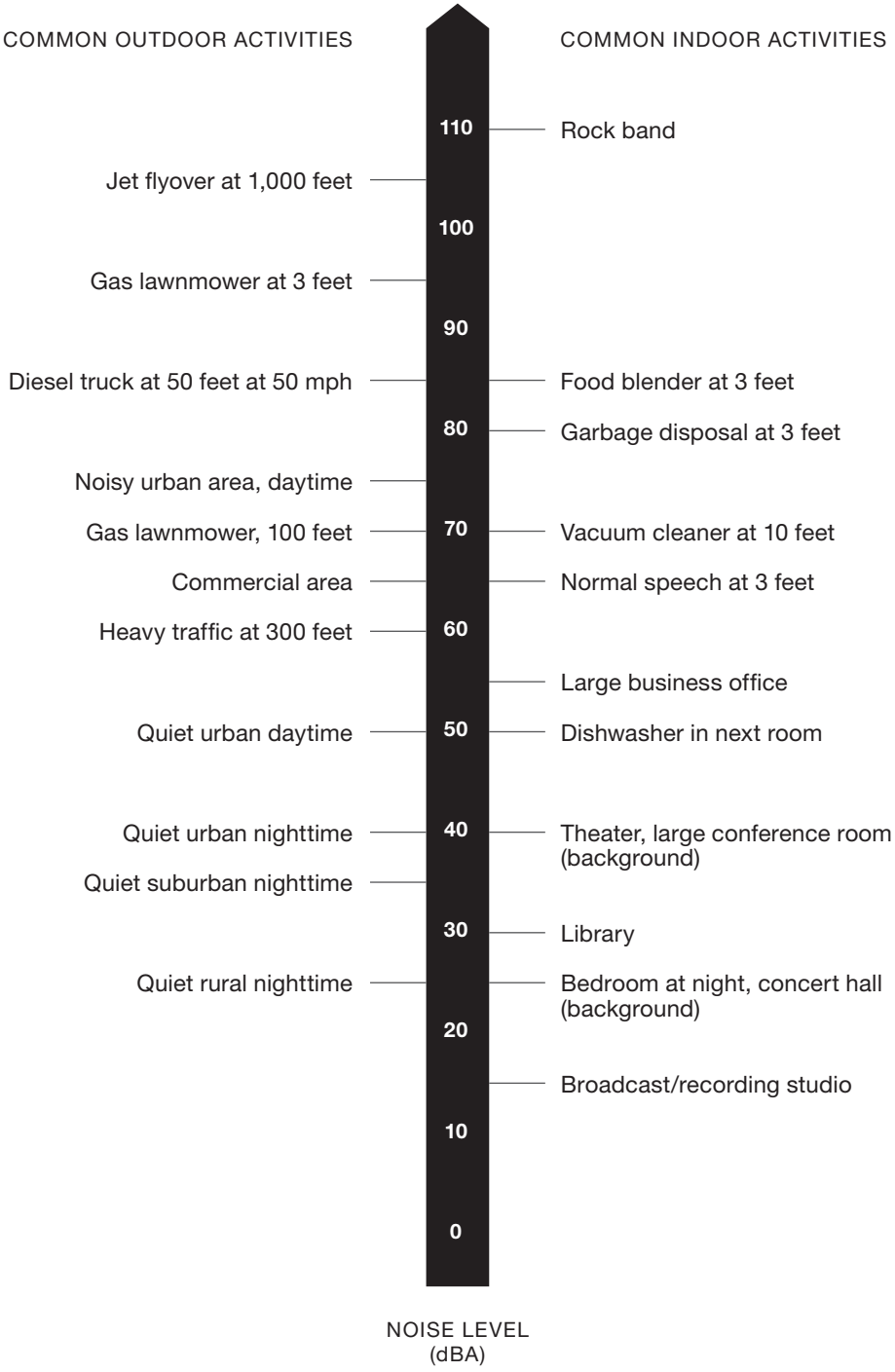
An individual's noise exposure is a measure of noise over a period of time. A noise level is a measure of noise at a given instant in time. The noise levels presented in Figure 4.10-1 are representative of measured noise at a given instant in time; however, they rarely persist consistently over a long period of time. Community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic. What makes community noise variable throughout a day, besides the slowly changing background noise, is the addition of short-duration, single-event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual.

These successive additions of sound to the community noise environment change the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized as the following:

L_{eq}: The L_{eq}, or equivalent sound level, is used to describe noise over a specified period of time in terms of a single numerical value; the L_{eq} of a time-varying signal and that of a steady signal are the same if they deliver the same acoustic energy over a given time. The L_{eq} may also be referred to as the average sound level.

L_{max}: The maximum, instantaneous noise level experienced during a given period of time.

L_{min}: The minimum, instantaneous noise level experienced during a given period of time.



Santa Susana Field Laboratory . 120894

SOURCE: Caltrans

Figure 4.10-1
Decibel Scale and
Common Noise Sources

L_x: The noise level exceeded X percent of a specified time period. For instance, L_{50} and L_{90} represents the noise levels that are exceeded 50 percent and 90 percent of the time, respectively.

L_{dn}: Also termed the Day-Night Sound Level (DNL), the L_{dn} is the average A-weighted noise level during a 24-hour day, obtained after an addition of 10 dBA to measured noise levels between the hours of 10:00 p.m. to 7:00 a.m. to account for nighttime noise sensitivity.

CNEL: CNEL, or Community Noise Equivalent Level, is the average A-weighted noise level during a 24-hour day that is obtained after an addition of 5 dBA to measured noise levels between the hours of 7:00 p.m. to 10:00 p.m. and an addition of 10 dBA to noise levels between the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively.

4.10.1.3 Effects of Noise on People

Noise is generally loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity that is a nuisance or disruptive. The effects of noise on people can be placed into four general categories:

- Subjective effects (e.g., dissatisfaction, annoyance)
- Interference effects (e.g., communication, sleep, and learning interference)
- Physiological effects (e.g., startle response)
- Physical effects (e.g., hearing loss)

Although exposure to high noise levels has been demonstrated to cause physical and physiological effects, the principal human responses to typical environmental noise exposure are related to subjective effects and interference with activities. Interference effects of environmental noise are those effects that interrupt daily activities, including interference with human communication activities (such as normal conversations, watching television, and telephone conversations) and interference with sleep. Sleep interference effects can include both awakening and arousal to a lesser state of sleep. With regard to the subjective effects, the responses of individuals to similar noise events are diverse and are influenced by many factors, including the type of noise, the perceived importance of the noise, the appropriateness of the noise to the setting, the duration of the noise, the time of day and the type of activity during which the noise occurs, and a given individual's noise sensitivity.

Overall, there is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction on people. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted (i.e., comparison to the ambient noise environment). In general, the more a new noise level exceeds the previously existing ambient noise level, the less acceptable the new noise level would be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships generally occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived.
- Outside of the laboratory, a 3 dBA change in noise levels is considered to be a barely perceivable difference.
- A change in noise levels of 5 dBA is considered to be a readily perceivable difference.
- A change in noise levels of 10 dBA is subjectively heard as doubling of the perceived loudness (Caltrans, 2013a).

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a nonlinear fashion; hence, the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, but rather logarithmically. Under the decibel scale, a doubling of sound energy corresponds to a 3 dBA increase. In other words, when two sources are each producing sound of the same loudness, the resulting sound level at a given distance would be approximately 3 dBA higher than one of the sources under the same conditions (Caltrans, 2013a). For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA. Under the decibel scale, three sources of equal loudness together produce a sound level of approximately 5 dBA louder than one source, and ten sources of equal loudness together produce a sound level of approximately 10 dBA louder than the single source.

4.10.1.4 Noise Attenuation

When noise propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on factors such as the type of noise source and the propagation path. Noise from a localized source (i.e., point source) propagates uniformly outward in a spherical pattern; therefore, this type of propagation is referred to as "spherical spreading." Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate between 6 dBA for hard sites and 7.5 dBA for soft sites for each doubling of distance from the reference measurement as their energy is continuously spread out over a spherical surface. Hard sites are those with a reflective surface between the source and the receiver, such as asphalt or concrete surfaces or smooth bodies of water. No excess ground attenuation is assumed for hard sites, and the change in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees. In addition to geometric spreading, an excess ground attenuation value of 1.5 dBA (per doubling distance between a source and a receiver) is normally assumed for soft sites.

Roadways and highways, and to some extent moving trains, consist of several localized noise sources on a defined path, and hence are treated as "line" sources, which approximate the effect of several point sources. Noise from a line source propagates over a cylindrical surface, often referred to as "cylindrical spreading." Line sources (e.g., traffic noise from vehicles along a road) attenuate at a rate between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the reference measurement (Caltrans, 2013a). Therefore, noise due to a line source attenuates less with distance than noise due to a point source.

4.10.1.5 Fundamentals of Vibration

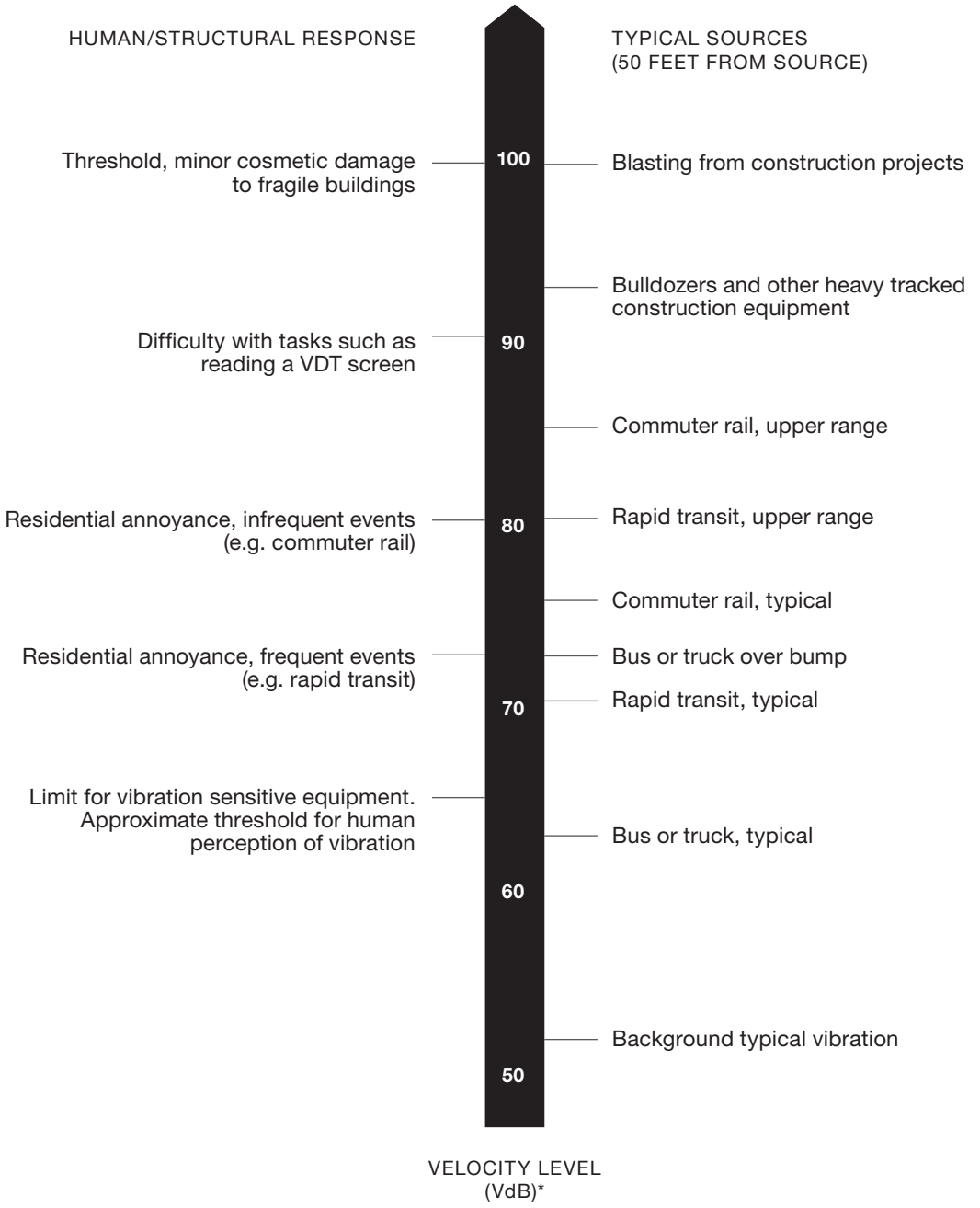
Vibration can be interpreted as energy transmitted in waves through the ground or man-made structures. These energy waves generally dissipate with distance from the vibration source. Because energy is lost during the transfer of energy from one particle to another, vibration becomes less perceptible with increasing distance from the source.

As described in the Federal Transit Administration's (FTA's) *Transit Noise and Vibration Impact Assessment* (FTA, 2006), ground-borne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard. In contrast to airborne noise, ground-borne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of ground-borne vibration are trains, buses on rough roads, and activities such as blasting, pile-driving, and operation of heavy earth-moving equipment.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The relationship of PPV to RMS velocity is expressed in terms of the "crest factor," defined as the ratio of the PPV amplitude to the RMS amplitude. PPV is typically a factor of 1.7 to 6 times greater than RMS vibration velocity (FTA, 2006). The VdB acts to compress the range of numbers required to describe vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment.

The effects of ground-borne vibration include movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for most projects, with the occasional exception of blasting and pile-driving. Annoyance from vibration often occurs when the vibration levels exceed the threshold of perception by only a small margin. A vibration level that causes annoyance would be well below the damage threshold for normal buildings. The FTA measure of the threshold of architectural damage for conventional sensitive structures is 0.2 inches per second (in/sec) PPV (FTA, 2006).

Figure 4.10-2 illustrates common vibration sources and the human and structural response to ground-borne vibration. The range of interest is from approximately 50 VdB to 100 VdB. In residential areas, the background vibration velocity level is usually around 50 VdB (approximately 0.0013 in/sec PPV). This level is well below the vibration velocity level threshold of perception for humans, which is approximately 65 VdB. A vibration velocity level of 75 VdB is considered to be the approximate dividing line between barely perceptible and distinctly perceptible levels for many people (FTA, 2006).



*RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second

SOURCE: Federal Transit Administration

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Figure 4.10-2
Typical Vibration Levels

4.10.1.6 Ground-borne Noise

Noise caused by vibration propagated through soil and building structures is referred to as ground-borne noise. It is normally radiated by the ground in open air and by walls, floors, and ceilings inside a building as a result of ground-borne vibration. Ground-borne noise in buildings is generated when interior surfaces (walls and floors) are vibrated, or "excited" into motion, by ground vibration transmitted into the structure. For example, ground vibration could cause windows to rattle or items on shelves to move. The features of a building's foundation, structure, and walls determine the building's response to incident ground vibration.

The relationship between ground-borne vibration and ground-borne noise depends on the frequency content of the vibration and the acoustical absorption of the receiving room. The more acoustical absorption there is in the room, the lower the noise level. For a room with average acoustical absorption, the unweighted sound pressure level is approximately equal to the average vibration velocity level of the room surfaces. Hence, the A-weighted level of ground-borne noise can be estimated by applying A-weighting to the vibration velocity spectrum. Since the A-weighting at 31.5 Hz is -39.4 dB, if the vibration spectrum peaks at 30 Hz, the A-weighted sound level would be approximately 40 dB lower than the velocity level. Correspondingly, if the vibration spectrum peaks at 60 Hz, the A-weighted sound level would be about 25 dB lower than the velocity level (FTA, 2006).

Table 4.10-1 describes the human response to different levels of ground-borne noise and vibration. Table 4.10-1 illustrates that achieving either the acceptable vibration or acceptable noise levels does not guarantee that the other would be acceptable. For example, the noise caused by vibrating structural components may be very annoying even though the vibration cannot be felt. Alternatively, a low-frequency vibration could be annoying while the ground-borne noise level it generates is acceptable.

TABLE 4.10-1
HUMAN RESPONSE TO DIFFERENT LEVELS OF GROUND-BORNE NOISE AND VIBRATION

Vibration Velocity Level	Noise Level		Human Response
	Low Frequency[a]	Mid Frequency[b]	
65 VdB	25 dBA	40 dBA	Approximate threshold of perception for many humans. Low-frequency sound usually inaudible, mid-frequency sound excessive for quiet sleeping areas.
75 VdB	35 dBA	50 dBA	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find transit vibration at this level annoying. Low-frequency noise acceptable for sleeping areas, mid-frequency noise annoying in most quiet occupied areas.
85 VdB	45 dBA	60 dBA	Vibration acceptable only if there are an infrequent number of events per day. Low-frequency noise annoying for sleeping areas, mid-frequency noise annoying even for infrequent events with institutional land uses such as schools and churches.

[a] Approximate noise level when vibration spectrum peak is near 30 Hz.
[b] Approximate noise level when vibration spectrum peak is near 60 Hz.

SOURCE: FTA, 2006.

4.10.1.7 Existing Conditions

The project site occupies approximately 2,850 acres of hilly terrain near the crest of Simi Hills and comprises areas of open space, much of which is in an undisturbed natural condition, and developed areas that include roads, buildings, and other infrastructure associated with its past use as a scientific research and test facility. Portions of the project site have undergone demolition, interim cleanup actions, and restoration activities, including hydroseeding, and, in some locations, replanting with native species. Developed infrastructure that currently exists in areas of the project site includes various buildings, structures, and inactive test stands; a network of paved and unpaved roads; water supply tanks, lines, wells, and aboveground storage tanks; electrical substations, transformers, and transmission lines; communication systems-related facilities; natural-gas lines; septic tanks, sewage treatment plants, and sewer pipelines; a GETS (constructed in 2009); and surface water treatment systems. The following are the current activities occurring onsite associated with each of the RPs:

- **Boeing** – Boeing currently maintains several offices located in the northeast portion of the project site. Current activities being conducted by Boeing at the site include soil and groundwater investigations along with surface water compliance activities. Additionally, public tours of the site are provided for purposes of community outreach. The total number of Boeing staff onsite varies on a daily basis, with approximately 15 staff members present at any given time at the site. Boeing has an additional 15 contractors, on average, assisting with soil and groundwater investigations, surface water compliance activities, and community outreach.
- **DOE** – Current activities associated with DOE at the project site include the required groundwater monitoring activities, inspections, and surveillance and maintenance activities. DOE contracts with North Wind for operations at the project site, and North Wind has one full-time employee onsite during working hours. Although DOE does not occupy any offices onsite, North Wind maintains a small office at the Radioactive Materials Handling Facility.
- **NASA** – NASA maintains a mobile office trailer for site management activities at the project site, which is co-located with supporting Conex containers and port-a-jons. On occasion, contractors establish temporary field offices in the vicinity of areas of operation throughout Area II. NASA's current activities at the site include environmental investigation activities conducted by five staff.

Overall, the RPs have staff, either directly employed or contracted, at the project site performing basic operational activities, typically on a daily basis. Of these operational activities, those associated with NASA's demolition of facilities in Area II, which entails the use of heavy off-road equipment, currently generates the highest noise levels at the site.

Existing Ambient Daytime Noise Levels

To characterize the existing daytime ambient noise conditions in the vicinity of the project site, short-term (30-minute) noise level measurements were conducted by Environmental Science Associates on Tuesday, March 10, 2015, from 9:53 a.m. to 12:54 p.m. at the offsite noise-sensitive locations shown in **Figure 4.10-3**. The short-term noise measurements were conducted using a Metrosonics db 3080 sound level meter, which was calibrated prior to and after its use to

ensure the accuracy of the measurements. The results of the short-term noise measurements are shown in **Table 4.10-2**.

TABLE 4.10-2
SUMMARY OF SHORT-TERM NOISE MEASUREMENTS

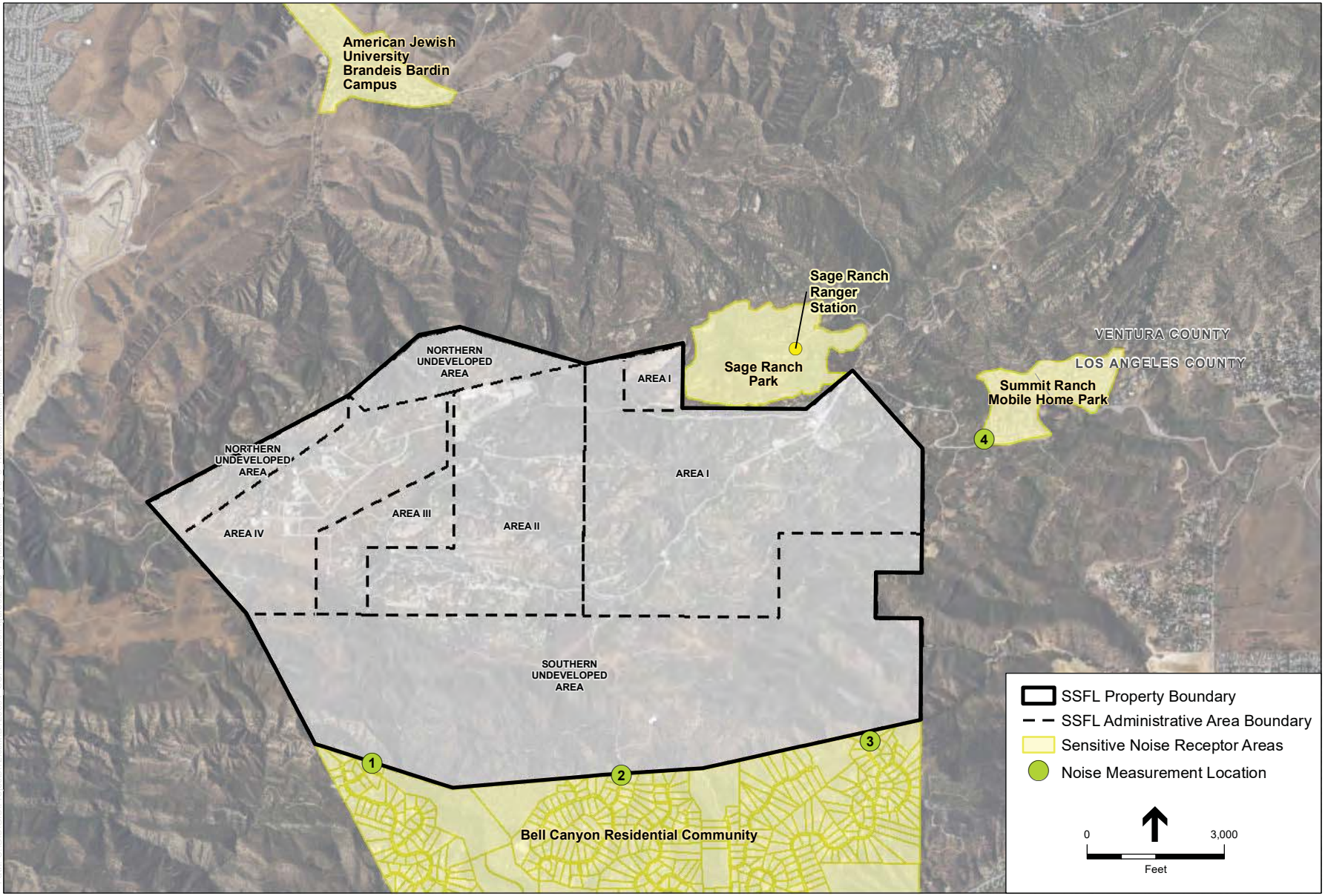
Location	Description	Date and Time Period	L_{eq} dBA	L_{max} dBA	Noise Sources
ST 1	End of Maverick Lane in Bell Canyon residential neighborhood	03/10/15 9:53 – 10:23 a.m.	43.8	58.6	Slight ambient vehicular noise; relatively quiet residential area with birds chirping occasionally
ST 2	End of North Hacienda Road in Bell Canyon residential neighborhood	03/10/15 10:48 – 11:18 a.m.	45.7	60.8	A few cars passing by in the area; birds chirping occasionally; overall relatively quiet noise environment
ST 3	Left side of Wrangler Street between the last two single-family residences in Bell Canyon residential neighborhood	03/10/15 11:32 a.m. – 12:02 p.m.	52.7	73.7	Multiple cars driving by in the area; gardener mowing nearby; birds chirping
ST 4	Along Woolsey Canyon Road at the end of residential development	03/10/15 12:24 – 12:54 p.m.	56.6	78.3	Vehicular traffic along Woolsey Canyon Road; loudest noise sources associated with large trucks driving by area

SOURCE: ESA, 2017d; measurement data is provided in Appendix I of this PEIR.

Existing Roadway Noise Levels Offsite

Existing roadway noise levels were calculated for 11 roadway segments located in the vicinity of the project site and analyzed in the traffic study prepared by KOA Corporation (KOA, 2017). Calculation of the existing roadway noise levels was accomplished using the Federal Highway Administration Highway Noise Prediction Model (FHWA-RD-77-108) acoustical algorithms and traffic volumes at the study intersections analyzed in the project's traffic study (KOA, 2017). The average noise levels at specific locations were modeled based on traffic volumes, mix of vehicle types, average speeds, and site environmental conditions. The modeled average daily noise levels along these roadway segments are presented in **Table 4.10-3**.

Woolsey Canyon Road, west of Valley Center Boulevard, experiences a roadway grade of greater than 5 percent. While ascending this stretch of Woolsey Canyon Road, truck engines may generate uncharacteristically high levels of engine noise. Because the FHWA-RD-77-108 prediction model does not take into account the roadway grade, the predicted noise level for the receivers along that stretch may be underestimated. Therefore, the FHWA's Traffic Noise Model (TNM) Version 2.5 (FHWA, 2004) was used to predict the traffic noise level for the receivers approximately 30 feet from Woolsey Canyon Road.



Source: ESA, ESRI, DeLorme 2015

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Figure 4.10-3

Sensitive Receptors and Noise Measurement Locations

TABLE 4.10-3
MODELED EXISTING ROADWAY NOISE LEVELS

Roadway	Roadway Segment	Peak-Hour Noise Levels (dBA L_{eq})[a]
Box Canyon Road	Between Santa Susana Pass Road and Roberson Road	55.5
Santa Susana Pass Road	Between Rocky Peak Road and Box Canyon Road	54.1
Woolsey Canyon Road	Between Valley Circle Boulevard and Knapp Ranch Road	59.4[b]
Valley Circle Boulevard	Between Box Canyon Road and Woolsey Canyon Road	55.6
	Between Plummer Street and Schumann Road	59.4
	Between Woolsey Canyon Road and Chatlake Drive	60.6
	Between Vanowen Street and Victory Boulevard	68.9
	Between Burbank Boulevard and US 101	69.1
Plummer Street	Between Valley Circle Boulevard and Farralone Avenue	61.4
Roscoe Boulevard	Between Woodlake Avenue and Shoup Avenue	64.3
	Between Shoup Avenue and Farralone Avenue	68.4
Topanga Canyon Blvd.	North of Plummer Street	71.6
	Between Plummer Street and Roscoe Boulevard	71.9
	South of Roscoe Boulevard	68.8

[a] Values represent noise levels at a reference distance of 100 feet from the centerline of the roadway.
[b] Distance between the centerline of Woolsey Canyon Road and the closest receiver is 30 feet.

SOURCE: KOA, 2017 (see Appendix H of this PEIR); ESA, 2017d; calculation data and results provided in Appendix I of this PEIR.

Existing Ground-borne Vibration Levels

The project site consists of approximately 2,850 acres comprising both open space and developed areas associated with the site's past use as a scientific research and test facility. The developed areas are generally occupied by structures that include, but are not limited to, various buildings, inactive test stands, storage tanks, electrical substations and transformers, communication systems-related facilities, septic tanks, sewage treatment plants, and treatment system facilities. Currently, the general operational activities conducted by the RPs at the project site, which include monitoring, investigation, and maintenance/compliance activities, do not require the use of mobile or stationary equipment that would generate substantial levels of ground-borne vibration. However, as mentioned previously, demolition of existing facilities in Area II (which is an ongoing activity that is not part of the cleanup activities) is also being conducted at the site. As such, the most notable sources of ground-borne vibration levels that are currently being generated at the site would be the use of heavy off-road equipment for these demolition activities. Although ground-borne vibration levels from equipment operation are generated, these levels would attenuate rapidly through the ground and only receptors in the immediate vicinity of the equipment would be exposed to perceptible levels of vibration. Given that Area II is approximately 404 acres in size, the demolition of select onsite buildings within this area would not result in any perceptible vibration levels at any offsite land uses surrounding the 2,850-acre project site.

Aside from the current ongoing activities at the project site, the surrounding land uses located offsite and in proximity to the project site include primarily residential, park, university, and open space uses. None of these existing offsite land uses involves operations that would generate perceptible levels of vibration. Thus, aside from the demolition work that is occurring in Area II of project site, the only other sources of ground-borne vibration in the vicinity of the project area would be general heavy-duty vehicular travel (e.g., refuse trucks, and delivery trucks) on local roadways. Trucks rarely create vibration that exceeds 70 VdB unless there are bumps in the road (FTA, 2006).

4.10.1.8 Sensitive Receptors

Noise-sensitive land uses are defined as those specific land uses that have associated indoor and/or outdoor human activities that may be subject to stress and/or significant interference from noise produced by other sound sources in the environment. Based on the County of Ventura General Plan, land uses considered to be noise-sensitive uses include residential, educational, and health facilities; research institutions; certain recreational and entertainment facilities (typically, indoor theaters and parks for passive activities); and churches. Land uses that are considered to be less sensitive to noise include commercial industrial facilities and certain noise-generating recreational facilities such as playgrounds and gymnasiums (County of Ventura, 2013). Currently, sensitive uses located in the vicinity of the project site include primarily residential, park, and educational uses. Specifically, the nearest and most notable noise-sensitive uses in the project site vicinity include:

- The American Jewish University campus located north of the project site within the county of Ventura.
- Sage Ranch Park located within the county of Ventura adjacent to the project site to the northeast that is occupied by the Santa Monica Mountains Conservancy and managed by the Mountains Recreation and Conservation Authority. The primary noise sensitive uses within Sage Ranch Park would be the ranger's house, camping sites, and the outdoor amphitheater. The use of the trail loop would be intermittent and temporary.
- The Summit Mobile Home Community residential homes located east of the project site in Woolsey Canyon within the city of Los Angeles.
- The Bell Canyon residential community, single-family homes located south and adjacent to the Southern Undeveloped Area of the project site within the county of Ventura.

4.10.2 Regulatory Setting

4.10.2.1 Federal

Noise

Under the authority of the Noise Control Act of 1972, USEPA established noise emission criteria and testing methods published in Parts 201 through 205 of Title 40 of the CFR that apply to some transportation equipment (e.g., interstate rail carriers, medium trucks, and heavy trucks) and construction equipment. In 1974, USEPA issued guidance levels for the protection of public health and welfare in residential land use areas (USEPA, 1974). The guidance levels specified an

outdoor L_{dn} noise level of 55 dBA and an indoor L_{dn} noise level of 45 dBA. These guidance levels are not considered as standards or regulations and were developed without consideration of technical or economic feasibility. There are no federal noise standards that directly regulate environmental noise related to the cleanup activities.

Under the Occupational Safety and Health Act of 1970 (29 U.S.C. Section 1919 et seq.), the Occupational Safety and Health Administration (OSHA) has adopted regulations designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise level exposure as a function of the amount of time during which the worker is exposed. The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed, ensuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.

Vibration

The FTA has adopted vibration standards that are used to evaluate potential building damage impacts related to cleanup activities. The vibration damage criteria adopted by the FTA are shown in **Table 4.10-4**.

TABLE 4.10-4
VIBRATION DAMAGE CRITERIA

Building Category	PPV (in/sec)
I. Reinforced-concrete, steel, or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

SOURCE: FTA, 2006.

In addition, the FTA has also adopted standards associated with human annoyance for ground-borne vibration impacts for the following three land-use categories: Vibration Category 1 – High Sensitivity, Vibration Category 2 – Residential, and Vibration Category 3 – Institutional. The FTA defines Category 1 as buildings where vibration would interfere with operations within the building, including vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and university research operations. Vibration-sensitive equipment includes, but is not limited to, electron microscopes, high-resolution lithographic equipment, and normal optical microscopes. Category 2 refers to all residential land uses and any buildings where people sleep, such as hotels and hospitals. Category 3 refers to institutional land uses such as schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment but still have the potential for activity interference. The vibration thresholds associated with human annoyance for these three land-use categories are shown in **Table 4.10-5**. No thresholds have been adopted or recommended for commercial and office uses. Because the project-induced vibration would be from cleanup activities, the impact thresholds would be based on Infrequent Events as stated in Table 4.10-5.

TABLE 4.10-5
GROUND-BORNE VIBRATION IMPACT CRITERIA FOR GENERAL ASSESSMENT

Land Use Category	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Category 1: Buildings where vibration would interfere with interior operations	65 VdB[d]	65 VdB[d]	65 VdB[d]
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB

[a] "Frequent Events" is defined as more than 70 vibration events of the same source per day.
[b] "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.
[c] "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day.
[d] This criterion is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes.

SOURCE: FTA, 2006.

4.10.2.2 State

Noise

The State of California does not have statewide standards for environmental noise, but the California Department of Health Services (DHS) has established guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. The purpose of these guidelines is to maintain acceptable noise levels in a community setting for different land use types. Noise compatibility by different land uses types is categorized into four general levels: "normally acceptable," "conditionally acceptable," "normally unacceptable," and "clearly unacceptable." For instance, a noise environment ranging from 50 dBA CNEL to 65 dBA CNEL is considered to be "normally acceptable" for multi-family residential uses, while a noise environment of 75 dBA CNEL or above for multi-family residential uses is considered to be "clearly unacceptable." In addition, Section 65302(f) of the California Government Code requires each county and city in the state to prepare and adopt a comprehensive long-range General Plan for its physical development, with Section 65302(g) requiring a Noise Element to be included in the General Plan. The Noise Element must: (1) identify and appraise noise problems in the community; (2) recognize Office of Noise Control guidelines; and (3) analyze and quantify current and projected noise levels.

Occupational noise exposure is regulated by California Occupational Safety and Health Administration (Cal-OSHA), which has promulgated Occupational Noise Exposure Regulations (8 California Code of Regulations Sections 5095–5099). These regulations set employee noise exposure limits that are equivalent to the federal OSHA standards mentioned earlier.

The California Noise Act of 1973 (Health and Safety Code Sections 46000–46002) sets forth a resource network to assist local agencies with legal and technical expertise regarding noise issues. The objective of the act is to encourage the establishment and enforcement of local noise ordinances.

Vibration

There are no state vibration standards applicable to the cleanup activities. Moreover, according to Caltrans Transportation and Construction Vibration Guidance Manual (Caltrans, 2013b), there are no official Caltrans standards for vibration impact. However, this manual provides guidelines that can be used as screening tools for assessing the potential for adverse vibration effects related to structural damage and human perception. The manual is meant to provide practical guidance to Caltrans engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans projects. Therefore, the Caltrans guidance was considered not applicable to the project.

4.10.2.3 Local

There are three jurisdictions that would be affected by the cleanup activities. The County of Ventura includes residential land uses to the south of the project site and a school to the north of the project site. The county of Los Angeles and city of Los Angeles include residential land uses along truck routes. The plans, policies, and standards from these three jurisdictions have been taken into consideration in this analysis.

County of Ventura General Plan

The following policy from the County of Ventura General Plan Noise Element is relevant to the project.

> 2.16.2-1.1.5: Construction noise shall be evaluated and, if necessary, mitigated in accordance with the County Construction Noise Threshold Criteria and Control Plan.

County of Ventura Construction Noise Threshold Criteria and Control Plan

Specific construction noise limits for noise-sensitive locations are not currently specified in the General Plan or ordinance code of the County of Ventura. As such, the County of Ventura Construction Noise Threshold Criteria and Control Plan was developed to establish construction noise thresholds and standard noise monitoring and control measures for use on all discretionary development projects (e.g., public projects, Conditional Use Permits) and ministerial development permits. Construction-noise monitoring methods are discussed in Appendix C of the plan, and effective noise mitigation measures that could be implemented for projects that exceed the established construction noise threshold criteria at sensitive receptor sites are included in Appendix D of the plan. Noise-sensitive receptors that would be affected by construction activities along with periods of greatest sensitivity to construction noise are identified in **Table 4.10-6**.

TABLE 4.10-6
NOISE-SENSITIVE RECEPTORS

Receptor Description	Typical Sensitive Time Period
Hospitals, Nursing Homes (quasi-residential)	24 hours
Single-Family and Multi-Family Dwellings (residential)	Evening/Night
Hotels/Motels (quasi-residential)	Evening/Night
Schools, Churches, Libraries (when in use)	Daytime/Evening

SOURCE: County of Ventura, 2005 (Amended 2010).

In summary, the construction noise threshold criteria that have been defined in the *County of Ventura Construction Noise Threshold Criteria and Control Plan* includes the following:

Daytime Construction[1] – Daytime (7:00 a.m. to 7:00 p.m., Monday through Friday, and from 9:00 a.m. to 7:00 p.m., Saturday, Sunday, and local holidays) generally means any time period not specifically defined as a more noise-sensitive time period. The daytime construction noise threshold criteria are given in **Table 4.10-7**. Depending on project duration, the daytime noise threshold criteria shall be the greater of the fixed $L_{eq}(h)$ limit (which includes non-construction evening and nighttime noise) or the measured ambient $L_{eq}(h)$ plus 3 dB.

TABLE 4.10-7
DAYTIME CONSTRUCTION ACTIVITY NOISE THRESHOLD CRITERIA

Construction Duration Affecting Noise-Sensitive Receptors	Noise Threshold Criteria shall be the greater of these noise levels at the nearest receptor area or 10 feet from the nearest noise-sensitive building	
	Fixed $L_{eq}(h)$, dBA	Hourly Equivalent Noise Level (L_{eq}), dBA[a,b]
0 to 3 days	75	Ambient $L_{eq}(h)$ + 3 dB
4 to 7 days	70	Ambient $L_{eq}(h)$ + 3 dB
1 to 2 weeks	65	Ambient $L_{eq}(h)$ + 3 dB
2 to 8 weeks	60	Ambient $L_{eq}(h)$ + 3 dB
Longer than 8 weeks	55	Ambient $L_{eq}(h)$ + 3 dB

[a] The instantaneous L_{max} shall not exceed the noise threshold criteria by 20 dBA more than eight times per daytime hour.
[b] Local ambient L_{eq} measurements shall be made on any mid-week day prior to project work.

SOURCE: County of Ventura, 2005 (Amended 2010).

[1] These criteria only apply to the noise-sensitive receptors that are sensitive to noise impacts during the daytime (see Table 4.10-6).

Evening Construction[2] – Evening hours (7:00 p.m. to 10:00 p.m.) are more noise-sensitive time periods. Therefore, evening construction-noise threshold criteria differ from the daytime criteria. Overall project construction noise, for the noise-sensitive hours specified, shall not exceed the noise threshold criteria listed in **Table 4.10-8**, at the nearest noise-sensitive receptor area or 10 feet from the façade of the nearest noise-sensitive building.

TABLE 4.10-8
EVENING CONSTRUCTION ACTIVITY NOISE THRESHOLD CRITERIA

	Evening Noise Threshold Criteria shall be the greater of these noise levels at the nearest receptor area or 10 feet from the nearest noise-sensitive building	
Receptor Location	**Fixed L_{eq}(h), dBA**	**Hourly Equivalent Noise Level (L_{eq}), dBA[a,b]**
Residential	50	Ambient L_{eq}(h) + 3 dB

[a] The instantaneous L_{max} shall not exceed the noise threshold criteria by 20 dBA more than 6 times per evening hour.
[b] Hourly evening local ambient noise measurements shall be made on a typical mid-week evening prior to project work.

SOURCE: County of Ventura, 2005 (Amended 2010).

Nighttime Construction[3] – Nighttime hours (10:00 p.m. to 7:00 a.m., Monday through Friday, and from 10:00 p.m. to 9:00 a.m., Saturday, Sunday, and local holidays) are the most noise-sensitive time periods. Therefore, nighttime and holiday construction noise threshold criteria differ from the daytime and evening criteria. Overall project construction noise, for the noise-sensitive hours specified, shall not exceed the noise threshold criteria listed in **Table 4.10-9**, at the nearest noise-sensitive receptor area or 10 feet from the façade of the nearest noise-sensitive building.

TABLE 4.10-9
NIGHTTIME CONSTRUCTION ACTIVITY NOISE THRESHOLD CRITERIA

	Nighttime Noise Threshold Criteria shall be the greater of these noise levels at the nearest receptor area or 10 feet from the nearest noise-sensitive building	
Receptor Location	**Fixed L_{eq}(h), dBA**	**Hourly Equivalent Noise Level (L_{eq}), dBA[a,b]**
Resident, Live-in Institutional	45	Ambient L_{eq}(h) + 3 dB

[a] The instantaneous L_{max} shall not exceed the noise threshold criteria by 20 dBA more than 4 times per nighttime hour.
[b] Hourly nighttime local ambient noise measurements shall be made on a typical mid-week night prior to project work.

SOURCE: County of Ventura, 2005 (Amended 2010).

[2] These criteria apply to all noise-sensitive receptors (see Table 4.10-6).
[3] These criteria only apply to the noise-sensitive receptors that are sensitive to noise impacts during the nighttime (see Table 4.10-6).

Maximum Construction Noise – In addition, the construction-related, slow response, instantaneous maximum noise (L_{max}) shall not exceed the noise threshold criteria by 20 dBA more than eight times per daytime hour, more than six times per evening hour, and more than four times per nighttime hour.

County of Ventura Vibration Regulation

Neither the County of Ventura General Plan nor Municipal Code has established standards with respect to vibration levels. However, the Ventura County Initial Study Assessment Guidelines (County of Ventura, 2011) stipulates that the vibration threshold criteria provided by the FTA should be used in the assessment of whether a project would result in a significant effect on the environment. These vibration threshold criteria are discussed further under Section 4.10.2, *Thresholds of Significance*.

County of Los Angeles General Plan Noise Element

The Los Angeles County General Plan Noise Element includes guidelines that are based on the community noise compatibility guidelines established by the DHS, as previously discussed. Specific regulations that implement these guidelines are set forth in the Los Angeles County Municipal Code as discussed below.

County of Los Angeles Municipal Code

Chapter 12.08, Noise Control, of the County of Los Angeles Municipal Code serves as the Noise Ordinance for the County and establishes noise standards to control unnecessary, excessive, and annoying noise and vibration in the County. With respect to construction noise in Los Angeles County, Section 12.08.440 of the Noise Ordinance prohibits the operation of any tools or equipment used between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, that would create a noise disturbance across a residential or commercial real-property line. Section 12.08.230 defines “noise disturbance” as an alleged intrusive noise, which violates an applicable noise standard as set forth in Municipal Code Chapter 12.08, Noise Control. The only exceptions would be emergency work of public service utilities or by variance issued by the health officer. Additionally, both the working hours and maximum levels of equipment and activity noise that are allowable from both mobile and stationary construction equipment in Los Angeles County are defined by land use and shown in **Table 4.10-10**.

TABLE 4.10-10
COUNTY OF LOS ANGELES CONSTRUCTION NOISE STANDARDS

Allowable Work Dates & Hours	Residential Facilities					
	Single-Family		Multi-Family		Semi-Residential/Commercial	
	Mobile Equipment [a]	Stationary Equipment [b]	Mobile Equipment [a]	Stationary Equipment [b]	Mobile Equipment [a]	Stationary Equipment [b]
Daily 7:00 a.m. to 8:00 p.m.[c]	75 dBA	60 dBA	80 dBA	65 dBA	85 dBA	70 dBA
Daily 8:00 p.m. to 7:00 a.m.[d]	60 dBA	50 dBA	64 dBA	55 dBA	70 dBA	60 dBA
	Business Facilities					
Daily [d]	85 dBA					

[a] Represents maximum noise levels for nonscheduled, intermittent, short-term operation (less than 10 days).
[b] Represent maximum noise level for repetitively scheduled and relatively long-term operation (periods of 10 days or more).
[c] Exception for Sundays and legal holidays.
[d] Includes all day Sunday and legal holidays.

SOURCE: County of Los Angeles Ordinance No. 11743, Section 12.08.440.

County of Los Angeles Vibration Regulation

With respect to vibration, the County of Los Angeles Noise Ordinance identifies a presumed perception threshold of 0.01 in/sec over the range of 1 to 100 Hz. Section 12.08.560 of the County of Los Angeles Noise Ordinance prohibits the operation of any device that creates vibration above the vibration perception threshold of any individual at 150 feet (46 meters) from the source if on a public space or public right-of-way.

City of Los Angeles General Plan Noise Element

The Noise Element of the City of Los Angeles General Plan is intended to identify sources of noise and provide objectives and policies that ensure that noise from various sources does not create an unacceptable noise environment. Overall, the City's Noise Element describes the noise environment (including noise sources) in the city; addresses noise mitigation regulations, strategies, and programs; and delineates federal, state, and city jurisdiction relative to rail, automotive, aircraft, and nuisance noise.

The City's noise standards are correlated with land use zoning classifications in order to maintain identified ambient noise levels and to limit, mitigate, or eliminate intrusive noise that exceeds the ambient noise levels within a specified zone. The City has adopted local guidelines based, in part, on the community noise compatibility guidelines established by the California DHS for use in assessing the compatibility of various land use types with a range of noise levels. The City's noise/land use compatibility guidelines for land uses are shown in **Table 4.10-11**.

TABLE 4.10-11
CITY OF LOS ANGELES GUIDELINES FOR NOISE COMPATIBLE LAND USE

	Day-Night Average Exterior Sound Level (CNEL dBA)						
Land Use Category	**50**	**55**	**60**	**65**	**70**	**75**	**80**
Residential Single-Family, Duplex, Mobile Home	A	C	C	C	N	U	U
Residential Multi-Family	A	A	C	C	N	U	U
Transient Lodging, Motels, Hotels	A	A	C	C	N	U	U
School, Library, Church, Hospital, Nursing Home	A	A	C	C	N	N	U
Auditorium, Concert Hall, Amphitheater	C	C	C	C/N	U	U	U
Sports Arena, Outdoor Spectator Sports	C	C	C	C	C/U	U	U
Playground, Neighborhood Park	A	A	A	A/N	N	N/U	U
Golf Course, Riding Stable, Water Recreation, Cemetery	A	A	A	A	N	A/N	U
Office Building, Business Commercial, and Professional	A	A	A	A/C	C	C/N	N
Agriculture, Industrial, Manufacturing, Utilities	A	A	A	A	A/C	C/N	N

A =Normally acceptable: Specified land use is satisfactory, based upon assumption buildings involved are conventional construction, without any special noise insulation.
C =Conditionally acceptable: New construction or development only after a detailed analysis of noise mitigation is made and needed noise insulation features are included in project design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, normally would suffice.
N =Normally unacceptable: New construction or development generally should be discouraged. A detailed analysis of noise reduction requirements must be made and noise insulation features included in the design of a project.
U =Clearly unacceptable: New construction or development generally should not be undertaken.

SOURCE: City of Los Angeles, 1999.

City of Los Angeles Municipal Code

The City's comprehensive Noise Ordinance, found in Chapter XI of the City of Los Angeles Municipal Code (LAMC), sets forth sound measurement and criteria, minimum ambient noise levels for different land use zoning classifications, sound emission levels for specific uses, hours of operation for certain uses, standards for determining when noise is deemed to be a disturbance, and legal remedies for violations. Key provisions of Chapter XI of the LAMC are discussed below.

Section 41.40 of the LAMC prohibits construction activity and repair work where the use of any power tool, device, or equipment would disturb persons occupying sleeping quarters in any dwelling, hotel, apartment, or other place of residence between the hours of 9:00 p.m. and 7:00 a.m. Monday through Friday, and between 6:00 p.m. and 8:00 a.m. on Saturday. All such activities are also prohibited on Sundays and all federal holidays. Construction hours may be extended with approval from the Executive Director of the Board of Police Commissioners.

Section 112.05 of the LAMC prohibits the operation of any powered equipment or powered hand tool that produces a maximum noise level exceeding the following noise limits at a distance of 50 feet from the source of the noise between the hours of 7:00 a.m. and 10:00 p.m. when the source is located within 500 feet of a residential zone:

a) 75 dB(A) for construction, industrial, and agricultural machinery including crawler-tractors, dozers, rotary drills and augers, loaders, power shovels, cranes, derricks, motor graders, paving machines, off-highway trucks, ditchers, trenchers, compactors, scrapers, wagons, pavement breakers, compressors, and pneumatic or other powered equipment.

b) 75 dB(A) for powered equipment of 20 horsepower or less intended for infrequent use in residential areas, including chain saws, log chippers, and powered hand tools.

c) 65 dB(A) for powered equipment intended for repetitive use in residential areas, including lawn mowers, backpack blowers, small lawn and garden tools, and riding tractors.

Of the noise level limits presented previously, the limit listed under Item (a) would be applicable to the cleanup activities. However, none of the noise limitations identified would apply where compliance is deemed to be technically infeasible, which means that the noise limitations cannot be complied with despite the use of mufflers, shields, sound barriers, and/or other noise reduction device or techniques during the operation of the equipment. The aforementioned limitations apply only to uses in residential zones or within 500 feet thereof.

4.10.3 Thresholds of Significance

For the purposes of this PEIR, DTSC has based the thresholds of significance on the checklist questions in Appendix G of the CEQA Guidelines. In addition, The County of Ventura's Initial Study Assessment Guidelines along with Los Angeles County standards have been incorporated, as appropriate, into the analysis. Please see Chapter 7.0, *Impacts Found Not to Be Significant*, of this PEIR, for a discussion of other issues associated with the evaluation of noise where the characteristics of the project made it clear that effects would not be significant and further evaluation in this section was not warranted.

Based on the size and scope of the project and the potential for impacts, the criteria identified below are included for evaluation in this PEIR.

Would the project result in:

4.10-1 Exposure of persons to or the generation of noise levels in excess of standards established in the County of Ventura Construction Noise Threshold Criteria and Control, the County of Los Angeles Municipal Code, and the City of Los Angeles Municipal Code related to construction (refer to Impact Statements 4.10-1a and 4.10-1b)?

4.10-2 Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels that exceed the threshold criteria provided in FTA's Transit Noise and Vibration Impact Assessment (refer to Impact Statements 4.10-2a and 4.10-2b)?

4.10-3 A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project (refer to Impact Statements 4.10-3a and 4.10-3b)?

4.10-4 A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project (refer to Impact Statements 4.10-4a and 4.10-4b)?

4.10.3.1 Noise Criteria

As discussed previously, no federal or state noise standards apply to the project. Therefore, since the project site is located within an unincorporated area of the County of Ventura and the local roadway network used by the project's haul trucks to access the project site along with some of the offsite sensitive uses that could potentially be affected by the project's noise levels are located in both the county of Los Angeles and city of Los Angeles, this analysis evaluates the potential noise impacts resulting from implementation of the project in terms of whether the applicable County of Ventura, County of Los Angeles, or City of Los Angeles noise standards would be exceeded within the respective jurisdictions.

With respect to Impact Statements 4.10-1a and 4.10-1b:

County of Ventura: It would be considered a significant impact if the project noise level at the nearest receptor area or 10 feet from the nearest noise-sensitive building exceeds 55 dBA or ambient noise level plus 3 dBA (whichever greater) during the daytime hours and 50 dBA or ambient noise level plus 3 dBA (whichever greater) during the evening hours.

County of Los Angeles: It would be considered a significant impact if the project noise level that would create a noise disturbance across a residential or commercial real-property line that exceeds 60 dBA for single-family residential, 65 dBA for multi-family residential, or 70 dBA for semi-residential/commercial between the hours of 7:00 a.m. and 8:00 p.m. as well as 50 dBA for single-family residential, 55 dBA for multi-family residential, or 60 dBA for semi-residential/commercial between the hours of 8:00 p.m. and 7:00 a.m. including Sunday and legal holidays.

City of Los Angeles: It would be considered a significant impact if the project noise level exceeds 75 dBA at 50 feet when off-highway trucks are located within 500 feet of residential zone between the hours of 7:00 a.m. and 10:00 p.m.

With respect to Impact Statements 4.10-3 (a and b) and 4.10-4 (a and b), the CEQA Guidelines do not define the levels at which permanent and temporary increases in ambient noise are considered "substantial." As such, to address these impacts for project cleanup activities, a "substantial" noise increase is defined as an increase in noise to a level that causes interference with land use activities at nearby sensitive receptors. CEQA significance criterion regarding "substantial temporary or periodic noise increases in ambient noise levels" generally applies to a project's short-term construction activities and the criterion regarding "substantial permanent increase in ambient noise levels" applies to a project's long-term operations. In the case of the cleanup

activities, noise levels generated would be associated with the operation of construction equipment for the cleanup activities at the project site. However, because project cleanup activities would be completed over a 15-year period, the noise generated by these activities can also be considered to be relatively "long-term." As such, the CEQA significance criteria regarding both "temporary" and "permanent" increases in ambient noise levels are addressed as one impact analysis in this section for project cleanup activities.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise would typically be judged. Thus, the significance of the project's traffic-related noise impacts to the offsite noise sensitive uses can be determined by comparing estimated project-related noise levels to existing no-project noise levels. As discussed previously, in an outdoor environment, the average healthy ear can barely perceive a noise level change of 3 dBA. A change from 3 to 5 dBA may be noticed by some individuals who are sensitive to changes in noise. A 5 dBA increase is considered to be readily noticeable, while the human ear perceives a 10 dBA increase as a doubling of sound. Thus, because a change of 3 dBA is considered as a barely audible change and a change of 5 dBA in an exterior environment is considered to be readily perceptible, for the purpose of analysis in this PEIR, an increase of 5 dBA or greater over the existing noise levels in the noise exposure of sensitive receptors due to traffic is considered a substantial change for the noise sensitive uses located within the county of Los Angeles and the city of Los Angeles. As it is specified in Section 4.10.2.3, the County of Ventura defines the noise threshold criteria as the ambient plus 3 dBA. Therefore, the noise sensitive uses within the County of Ventura would be considered a substantial change when project noise level exceeds 3 dBA or greater over the existing noise levels.

4.10.3.2 Vibration Criteria

To assess potential vibration impacts resulting from the cleanup activities, this analysis relies on the methodology recommended by the FTA, which is also recommended in the Ventura County Initial Study Assessment Guidelines. Thus, in terms of construction-related vibration impacts on buildings, the adopted guidelines/recommendations by the FTA to limit ground-borne vibration based on the age and/or condition of the facilities that are located in proximity to construction activity are used to evaluate potential ground-borne vibration impacts. Based on the FTA criteria, impacts relative to ground-borne vibration would be considered significant if any of the following were to occur:

- Project activities would cause a PPV ground-borne vibration level to exceed 0.5 in/sec at a reinforced concrete, steel, or timber building.
- Project activities would cause a PPV ground-borne vibration level to exceed 0.3 in/sec at any engineered concrete and masonry building.
- Project activities would cause a PPV ground-borne vibration level to exceed 0.2 in/sec at any non-engineered timber and masonry buildings.
- Project activities would cause a PPV ground-borne vibration level to exceed 0.12 in/sec at any buildings "extremely susceptible to vibration damage" (i.e., a historical building).

In terms of ground-borne vibration impacts associated with human annoyance, this analysis uses the FTA's vibration impact thresholds for sensitive buildings, residences, and institutional land uses under conditions where there are an infrequent number of events per day. The applicable threshold for this project is 80 VdB at residences and buildings where people normally sleep (FTA, 2006).

In addition, as described previously, Section 12.08.560 of the County of Los Angeles Noise Ordinance prohibits the operation of any device that creates vibration above the vibration perception threshold of any individual at 150 feet (46 meters) from the source if on a public space or public right-of-way. The County Noise Ordinance identifies a presumed perception threshold of 0.01 in/sec over the range of 1 to 100 Hz. As such, the project's potential vibration impacts within the County of Los Angeles' jurisdiction have been evaluated relative to this vibration perception threshold.

4.10.4 Methodology

The primary source of noise associated with the project would be soil and groundwater cleanup activities, along with demolition activities within the site. Thus, the increase in noise levels generated by the project's activities onsite and traffic-related noise increases on the local roadways offsite have been quantitatively estimated and compared to the applicable noise standards and thresholds of significance.

Aside from noise levels, ground-borne vibration also would be generated during the project's activities by various off-road (e.g., dozers, scrapers, excavators, loaders, backhoes) and on-road (e.g., haul trucks) equipment. Thus, the ground-borne vibration levels generated by these sources have also been quantitatively estimated and compared to applicable thresholds of significance.

4.10.4.1 Onsite Noise Levels

Because the project site is located in an unincorporated, the project's onsite noise impacts were evaluated using the assessment methodology, criteria, and reporting procedures provided in the *County of Ventura Construction Noise Threshold Criteria and Control Plan* (County of Ventura, 2005, Amended 2010). Potential noise levels were identified for the nearest sensitive receptors located offsite based on their respective distances from the project site. Over the course of the project's schedule, there would be numerous activities performed in different portions of the site by various pieces of equipment. Noise at any specific offsite receptor would be dominated by the closest and loudest equipment. For the purpose of this analysis, the estimated noise levels for an equipment mix consisting of five different pieces of equipment are assumed to be operating simultaneously and located at the same location nearest to each of the affected receptors offsite. To present a conservative impact analysis, the five loudest pieces of equipment with the highest usage percentages were chosen from the overall equipment inventory that was used in the air quality analysis (see Section 4.2, *Air Quality*, of this PEIR).[4] These assumptions are considered conservative, because activities and equipment typically would be spread throughout an active

[4] The five different pieces of equipment used in the analysis include a dozer, scraper, loader, excavator, and haul truck.

area within the project site and would often be located farther away from the affected receptors rather than operating at the nearest project work area to the receptors. Nonetheless, although it is unlikely that five pieces of equipment would be operating simultaneously at the same location nearest to the affected receptors, for the purpose of presenting a scenario that represents the greatest degree of potential impact, this assumption is used in the analysis.

In estimating the noise levels at the nearest offsite sensitive receptors that represents the greatest degree of potential impact, equipment noise levels provided in Figure A-1 of Appendix A of the *County of Ventura Construction Noise Threshold Criteria and Control Plan* (County of Ventura, 2005, Amended 2010) were used; these noise levels are shown in **Table 4.10-12**.

TABLE 4.10-12
TYPICAL CONSTRUCTION EQUIPMENT NOISE

Equipment Type Noise Source	Dominant Noise Components[a]	50-Foot Noise Level (L_{eq}) dBA[b,c]	Noise Level Range (L_p) dBA[b,c]	50-Foot Maximum Noise Level (L_{max}) dBA[b,c]
Air Compressor (portable)[d]	E, C, H, I	81	76-89	89
Air Compressor (stationary)	E, C, H, I	82	76-89	89
Auger, Drilled Shaft Rig	E, C, F, I, W	82	76-89	89
Backhoe	E, C, F, I, H, W	85	81-90	90
Bar Bender	E, P, W	82	78-88	85
Chain Saw	E, W, C	85	72-88	88
Compactor	E, C, F, I, W	82	81-85	85
Concrete Batch Plant	W, E, C	92	80-96	96
Concrete Mixer (small trailer)	W, E, C	67	65-68	68
Concrete Mixer Truck	E, C, F, W, T	85	69-89	89
Concrete Pump Trailer	E, C, H	82	74-84	84
Concrete Vibrator	W, E, C	76	68-81	81
Crane, Derrick	E, C, F, I T	88	79-90	90
Crane, Mobile	E, C, F, I, T	83	80-85	85
Dozer (Bulldozer)	E, C, F, I, H	80	77-90	90
Excavator	E, C, F, I, H, W	87	83-92	92
Forklift	E, C, I, W	84	81-86	86
Front End Loader	E, C, F, I, H	79	77-90	90
Generator	E, C	78	71-87	87
Gradall	E, C, F, I, W	82	78-85	85
Grader	E, C, F, I, W	85	79-80	89
Grinder	W	80	75-82	82
Hydraulic Hammer	W, E, C, H	102	99-105	105
Impact Wrench	W, P	85	75-85	85
Jackhammer	P, W, E, C	82	75-88	88
Paver	E, D, F, I	89	82-92	92

Equipment Type Noise Source	Dominant Noise Components[a]	50-Foot Noise Level (L_{eq}) dBA[b,c]	Noise Level Range (L_p) dBA[b,c]	50-Foot Maximum Noise Level (L_{max}) dBA[b,c]
Pile Driver (Impact/Sonic/Hydraulic)	W, P, E	101/96/65	94-107/90-99/65	107/99/65
Pavement Breaker	E, E, P	82	75-85	85
Pneumatic Tool	P, W, E, C	85	78-88	88
Pump	E, C	76	68-80	80
Rock Drill	W, E, P	98	83-99	99
Roller	E, C, F, I, W	74	70-83	83
Sand Blaster	W, E, C, H, I	85	80-87	87
Saw, Electric	W	78	59-80	80
Scraper	E, C, F, I, W	88	82-91	91
Shovel	E, C, F, I, W	82	77-90	90
Tamper	W, E, C	86	85-88	88
Tractor	E, C, F, I, W	82	77-90	90
Trencher		83	81-85	85
Trucks (Under Load)	E, C, F, I, T	88	81-95	95
Water Truck	W, E, C, F, I, T	90	89-94	94
Other Equipment with Diesel	E, C, F, I	82	75-88	88

Notes: C = Casing, E = Exhaust, F = Fan, H = Hydraulics, I = Intake air, P = Pneumatic exhaust, T = Transmission, W = Work tool.

[a] Ranked noise components.
[b] Table based on USEPA studies and measured data from various construction equipment and manufacturer's data.
[c] Equipment noise levels are at 50 feet from individual construction equipment and with no other noise contributors.
[d] Portable air compressor rated at 75 cubic feet per minute (cfm) or greater and operating at greater than 50 pounds per square inch (psi).

SOURCE: County of Ventura, 2005 (Amended 2010).

Based on the noise levels shown in Table 4.10-12, both the maximum (L_{max}) and 1-hour energy average (L_{eq}) noise levels resulting from cleanup activities at offsite sensitive receptor locations were calculated using methods outlined in Appendix B (Estimating Construction Project Noise) of the *County of Ventura Construction Noise Threshold Criteria and Control Plan* (County of Ventura, 2005, Amended 2010). In addition, given the existing characteristics of the project site and its surrounding area, ground-effect attenuation (absorption) provided by the area's natural surfaces, such as normal earth and ground vegetation, was also factored into the calculations of the project's estimated noise levels at the nearest offsite sensitive receptor locations, in accordance with the assessment method recommended in FTA's Transit Noise and Vibration Impact Assessment (FTA, 2006).

Upon determining the estimated noise levels at the nearest affected receptors, which are located in the County of Ventura and County of Los Angeles, from the simultaneous operation of five pieces of equipment, the noise levels were then analyzed against the applicable construction noise standards described in Section 4.10.3.1.

4.10.4.2 Roadway Noise Levels

Project-related offsite noise impacts associated with truck and worker vehicle trips were analyzed using the models of FHWA-RD-77-108 and TNM, which calculate the average noise level at specific locations based on traffic volumes, vehicle type mix, average speeds, and site environmental conditions.

Because the FHWA-RD-77-108 prediction model does not account for the roadway grade, the predicted noise level for the receivers along Woolsey Canyon Road could be underestimated. Therefore, the TNM was used to predict the traffic noise level for the receivers along Woolsey Canyon Road. Other locations were modeled with the FHWA-RD-77-108 model, because most of the roadways are relatively flat.

For the purpose of this analysis, both the maximum and average daily truck trips that could occur during project activities are assessed. The offsite truck volumes were obtained from the project's traffic consultant (KOA, 2017). The predicted noise levels were then analyzed against the applicable noise standards described in Section 4.10.3.1.

4.10.4.3 Ground-borne Vibration Levels

Ground-borne vibration levels resulting from the operation of construction equipment related to the cleanup and demolition activities at the project site were estimated using data published by the FTA in its Transit Noise and Vibration Impact Assessment document (FTA, 2006). Potential vibration levels resulting from the operation of construction equipment at the project are identified for offsite locations that are sensitive to vibration (i.e., residences) based on their distance from the nearest work area.

4.10.5 Analysis of Project Impacts

The following text describes the potential environmental impacts related to noise associated with implementing the overall site cleanup versus initial activities, demarcated as impacts "a" and "b," respectively. As presented in Section 3.7*, Initial Activities*, of this PEIR, the initial activities include eight different projects. Depending on the degree to which impacts of the initial activities would be similar to or different from each other, the impact analysis for the initial activities for some thresholds has been combined accordingly (i.e., the number of separate discussion for impact for each threshold ranges from one to eight). Following each potential impact is a significance determination for each potential impact.

4.10.5.1. Conflicts with General Plan or Noise Ordinances

Program Assessment

Impact 4.10-1a: Would implementation of the **overall site cleanup** result in exposure of persons to or the generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies?

Overall Site Cleanup (Impact 4.10-1a)

The cleanup activities at the project site would commence soon after approval of the PEIR, and would be completed within approximately 15 years. Most site activities would occur 5 days per week (Monday through Friday), 11 hours per day, and during daylight hours (7:00 a.m. to 6:00 p.m.). Longer workdays during the summer and work on Saturdays may occur. As many as 250 employees are expected to be onsite routinely during cleanup activities. Use of heavy off-road equipment would be required during the soil and groundwater cleanup activities at the project site. Project cleanup activities also would involve the use of smaller power tools, generators, and other sources of noise. The various cleanup activities (vegetation removal, clearing, grubbing, road improvements, excavation, stockpiling, etc.) would be completed using different combinations of equipment. As such, cleanup activity noise levels at and near the project site would fluctuate depending on the particular type, number, and duration of use of the various pieces of equipment.

As discussed previously, for the purpose of conducting a conservative analysis, noise levels were estimated for a scenario in which five of the loudest pieces of equipment with the highest usage percentage from the project's equipment inventory were assumed to be operating simultaneously at the same location nearest to offsite noise-sensitive receptor locations. However, the majority of the time noise levels at these offsite locations would be reduced as cleanup activities conclude or move to another location of the project site that is more distant from offsite sensitive receptors.

The nearest offsite sensitive receptors that would be exposed to increased noise levels during project cleanup activities would be the existing single-family residential, park, and university uses located around the project site (see Figure 4.10-3). Specifically, the nearest and most notable noise-sensitive uses located offsite in the project site vicinity include:

- The American Jewish University campus located north of the project site within the county of Ventura.
- Sage Ranch Park located within the county of Ventura adjacent to the project site to the northeast that is occupied by the Santa Monica Mountains Conservancy and managed by the Mountains Recreation and Conservation Authority. The primary noise sensitive uses within Sage Ranch Park would be the ranger's house, camping sites, and the outdoor amphitheater. The use of the trail loop would be intermittent and temporary.
- The Summit Mobile Home Community residential homes located east of the project site in Woolsey Canyon within the city of Los Angeles.
- The Bell Canyon residential community single-family homes located south and adjacent to the Southern Undeveloped Area of the project site within the county of Ventura.

Because of the proximity of these offsite sensitive uses, project cleanup activities would expose these sensitive receptors to increased noise levels. Over the course of a cleanup day, the highest noise levels would be generated when multiple pieces of equipment are being operated concurrently.

Table 4.10-13 shows the estimated noise levels that would occur at the nearest offsite sensitive uses under a conservative scenario where five pieces of equipment are operating concurrently at the work areas nearest to the offsite sensitive receptor.

TABLE 4.10-13
ESTIMATED NOISE LEVELS AT OFFSITE SENSITIVE USES DURING CLEANUP ACTIVITIES

Offsite Sensitive Land Uses	Location	Jurisdiction	Approximate Distance to Nearest Project Cleanup Area (ft.)[a]	Estimated Average Cleanup Activity Noise Levels (dBA, L_{eq}) [b]
American Jewish University campus	North of the project site	County of Ventura	4,200	38.6
Sage Ranch Park[c]	Adjacent to the project site to the northeast	County of Ventura	1,100	54.1
Summit Mobile Home Community residences	Approximately one-quarter mile east of project site	County of Los Angeles	3,200	41.8
Single-family residences	South of project site in the Bell Canyon residential community located along Wrangler Lane	County of Ventura	4,600	37.6
Single-family residences	South of project site in the Bell Canyon residential community located along Hacienda Road	County of Ventura	2,900	42.9
Single-family residences	South of project site in the Bell Canyon residential community located along Saddlebow Road	County of Ventura	2,000	47.2

a The distance is from the offsite receptor to the nearest work area of the project site where cleanup activities would occur.
b The estimated noise levels at each offsite receptor take into account the concurrent operation of five pieces of equipment at the same location.
c Noise-sensitive uses include ranger's house, camping sites, and amphitheater.

Source: ESA, 2017d (see Appendix I of this EIR).

As shown in Table 4.10-13, the nearest offsite sensitive receptors surrounding the project site would experience a range of noise levels during cleanup activities. The noise levels experienced by the offsite sensitive receptors during project cleanup activities would occur only for limited periods when equipment operates nearest to the receptors, and would not occur continuously throughout the entire cleanup period of approximately 15 years. Additionally, the estimated cleanup activity noise levels are conservative as it assumes that the five loudest pieces of equipment are operating simultaneously at the same location. In practice, operation of each piece of equipment at an active cleanup area would not be constant throughout the day, as equipment would be turned off when not in use. Most of the time over a workday, the equipment would also be operating at different locations within the active cleanup area and may not be operating

concurrently. While the estimated noise levels at each offsite receptor location would be the loudest when cleanup activities are occurring at an area within the project site that is nearest to the offsite location, the majority of the time noise levels at these offsite locations would be reduced as cleanup activities conclude or move to another more distant location of the project site.

Of the nearest noise-sensitive land uses analyzed in Table 4.10-13, with the exception of the residential homes at the Summit Mobile Home Community, which is located in Los Angeles County, all of the remaining identified uses are located within the county of Ventura. Because the noise criteria for construction-related noise levels are different under these two jurisdictions, the potential noise impacts from project cleanup activities at each of the identified offsite sensitive receptors are assessed according to their applicable noise criteria.

With respect to the offsite receptors located in the county of Ventura, because specific construction noise limits for noise-sensitive locations are not currently specified in the General Plan or ordinance code of the County of Ventura, the *County of Ventura Construction Noise Threshold Criteria and Control Plan* was developed to establish construction noise thresholds for use on all discretionary projects and ministerial permits.

As shown in Table 4.10-6, for residential uses (both single- and multi-family), the typical sensitive time periods for these uses with respect to construction noise are during the evening (7:00 p.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m. Monday through Friday, and 10:00 p.m. to 9:00 a.m. on Saturdays) hours, while for school uses the typical sensitive time periods for construction noise are during the daytime (7:00 a.m. to 7:00 p.m. Monday through Friday, and 9:00 a.m. to 7:00 p.m. on Saturdays) and evening hours. As described previously, while most project cleanup activities would occur during daylight hours on weekdays between 7:00 a.m. to 6:00 p.m., longer workdays during the summer and work on Saturdays may occur as well. Although the longer workdays during the summer months could extend into the evening hours, they would not extend into the nighttime hours.

An assessment of the potential noise impacts at the nearest offsite sensitive receptors located within the county of Ventura resulting from project cleanup activities is presented in **Table 4.10-14**. As shown, noise levels generated by the cleanup activities would exceed the County of Ventura construction noise threshold for residential uses at Sage Ranch Park, resulting in a significant impact from noise generated at the work areas in the northeastern portion of Area I. No construction noise threshold criteria have been established by the County of Ventura for park uses or open space. Because specific areas within the park include permanent and temporary housing (the ranger's house and camping sites), and other uses which are noise-sensitive (the outdoor amphitheater), those areas would be considered discrete noise-sensitive receivers, subject to the applicable residential threshold (as shown on Table 4.10-14).

Because project-related noise would exceed the County of Ventura's noise threshold for the sensitive receptors identified at Sage Ranch Park, Mitigation Measure NOISE-1 would be required. This mitigation measure prohibits cleanup activities within 1,000 feet of the northern boundary of Area I from occurring after 7:00 p.m. (which would ensure no noise is generated by

project-related equipment within 2,000 feet of the ranger's house. **Figure 4.10-4** shows the location of the 1,000-foot nighttime avoidance area. With implementation of Mitigation Measure NOISE-1, construction noise would be limited to an estimated 47.2 dBA in the location of the ranger's house and campsites after 7:00 p.m. (ESA, 2017d [see Appendix I]). This would ensure that the County of Ventura construction noise threshold for residential uses would not be exceeded. This impact would be less than significant with mitigation incorporated.

TABLE 4.10-14
POTENTIAL NOISE IMPACTS AT OFFSITE SENSITIVE LOCATIONS IN THE COUNTY OF VENTURA

Offsite Sensitive Land Uses	Jurisdiction	Estimated Average Cleanup Activity Noise Levels (dBA, L_{eq})	Applicable Noise Criteria (Daytime/Evening dBA L_{eq}[h])[a]	Exceed Noise Criteria?
American Jewish University campus	County of Ventura	38.6	55/50	No
Sage Ranch Park [c]	County of Ventura	54.1	NA/50[b]	Yes
Single-family residences [d]	County of Ventura	37.6	NA/50	No
Single-family residences [d]	County of Ventura	42.9	NA/50	No
Single-family residences [d]	County of Ventura	47.2	NA/50	No

a Because noise measurements were not conducted at all of the identified offsite sensitive land uses presented in this table, the fixed L_{eq}(h) noise level criteria established for noise-sensitive land uses in the *County of Ventura Construction Noise Threshold Criteria and Control Plan* are used in this analysis. As presented in Table 4.10-6, the typical sensitive time periods when the established noise criteria are applicable for residential uses are during the evening (7:00 p.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m. Monday through Friday, and 10:00 p.m. to 9:00 a.m. on Saturdays) periods, while the sensitive time periods when the established noise criteria area applicable for school uses are during the daytime (7:00 a.m. to 7:00 p.m. Monday through Friday, and 9:00 a.m. to 7:00 p.m. on Saturdays) and evening periods.

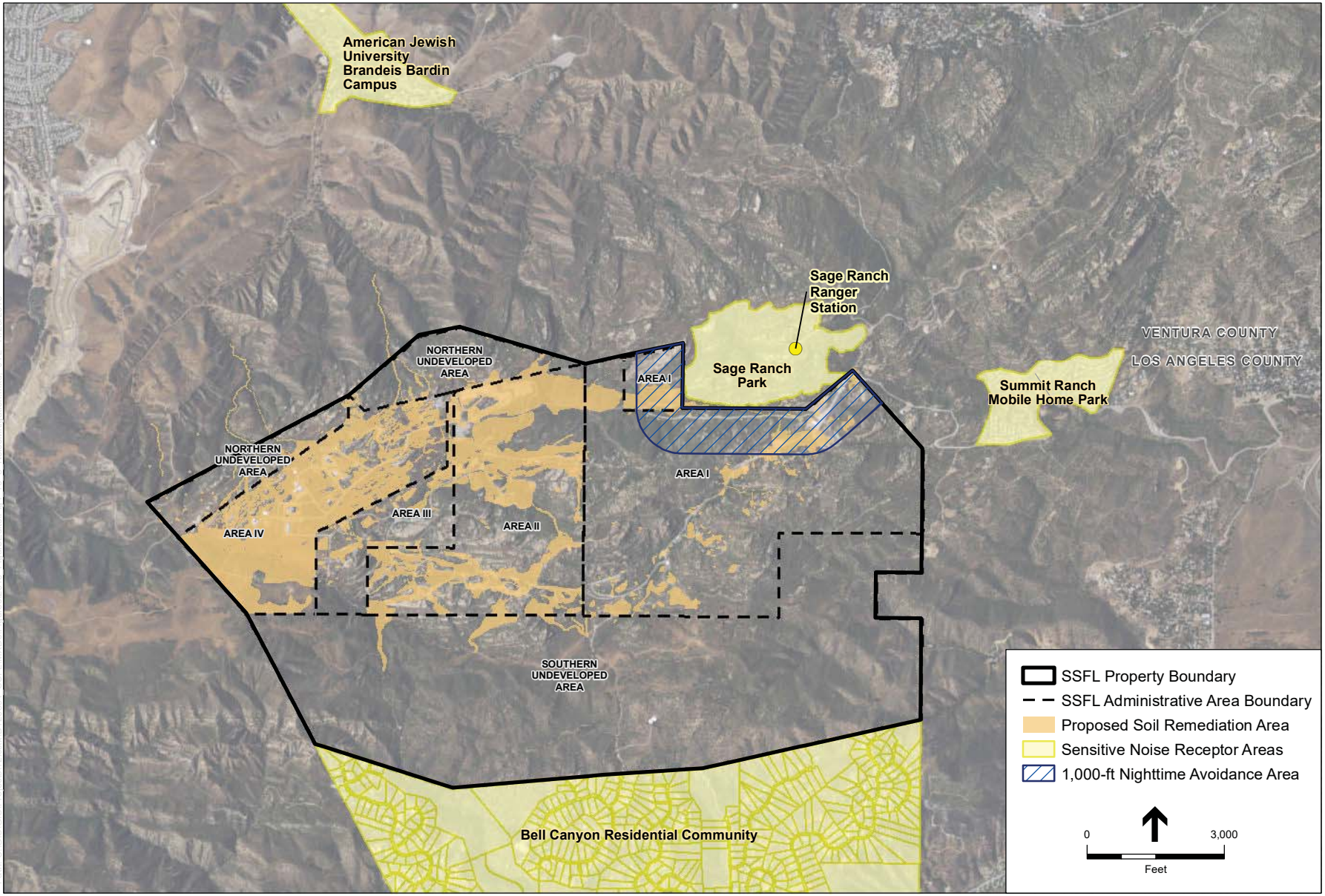
b No noise criteria have been defined in the *County of Ventura Construction Noise Threshold Criteria and Control Plan* for park uses.

c Noise-sensitive uses include ranger's house, camping sites, and amphitheater.

d Single-family residences located in the Bell Canyon community to the south of the project site.

Source: ESA, 2017d (see Appendix I of this EIR).

Remediation activities, including the use of heavy duty equipment, would be located as close as 50 feet to the Sage Ranch Loop Trail. Removal of lead shot from the former pistol range would be conducted using hand equipment, or, if warranted, with the use of mechanized equipment. The increase in noise levels from these remedial efforts would be perceptible to trail users. However, trail users' proximity to onsite cleanup activities would be temporary due to the transient nature of trail walking. As stated above, the County of Ventura does not define an applicable noise level threshold for outdoor or recreational uses, such as hiking on the trail. Therefore, this impact would be less than significant to the trail and other park users that do not stay at the park overnight.



Source: ESA, ESRI, DeLorme 2015

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Figure 4.10-4

Mitigation Measure NOISE-1 Nighttime Avoidance Area

With respect to the residential homes at the Summit Mobile Home Community located in Los Angeles County, Section 12.08.440 of Los Angeles County's Noise Ordinance stipulates that the operation of any tools or equipment that would violate an applicable noise standard across a residential or commercial real-property line is prohibited between weekday hours of 8:00 p.m. and 7:00 a.m. or at any time on Sundays or federal holidays.

Project cleanup activities would occasionally occur after 8:00 p.m. Additionally, Los Angeles County has also defined both the working hours and maximum levels of equipment and activity noise that are allowable from both mobile and stationary equipment by land use (refer to Table 4.10-10). Because the distance between the closest cleanup are and the Summit Mobile Home Community is 3,200 feet, equipment would be located within relatively small areas (i.e., not spread out over a large area), and the duration of cleanup activities would be greater than 10 days, the allowable maximum noise levels from equipment at single-family residential uses would be 60 dBA from 7:00 a.m. to 8:00 p.m. and 50 dBA from 8:00 p.m. to 7:00 a.m. An assessment of the potential noise impacts at the residential homes at the Summit Mobile Home Community located within Los Angeles County resulting from project cleanup activities is presented in **Table 4.10-15**.

TABLE 4.10-15
POTENTIAL NOISE IMPACTS AT OFFSITE SENSITIVE USE LOCATIONS IN LOS ANGELES COUNTY

Offsite Sensitive Land Uses	Jurisdiction	Estimated Average Cleanup Activity Noise Levels (dBA, L_{eq})	Applicable Noise Criteria (dBA)		Exceed Noise Criteria?
			7:00 a.m. – 8:00 p.m.	8:00 p.m. – 7:00 a.m.	
Summit Mobile Home Community residential homes	County of Los Angeles	41.8	60	50	No

Source: ESA, 2017d (see Appendix I of this EIR).

As shown in Table 4.10-15, noise levels generated by the project would not exceed Los Angeles County's thresholds for construction-related noise in the area of the Summit Mobile Home Community. Therefore, noise impacts to the Summit Mobile Home Community would be less than significant.

> Conclusion: For the sensitive receptors located in the county or city of Los Angeles, the overall site cleanup would not exceed the applicable noise standards established by the County of Los Angeles. However, the overall site cleanup would generate noise levels that would exceed the applicable noise standards established by the County of Ventura for noise-sensitive land uses at Sage Ranch Park. Mitigation Measure NOISE-1 would reduce impacts so that the applicable County of Ventura noise threshold would not be exceeded at sensitive receptors within Sage Ranch Park. This impact would be less than significant with implementation of Mitigation Measure NOISE-1.

Impact 4.10-1a Determination: *The* ***overall site cleanup*** *would result in exposure of persons to or the generation of noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards or other agencies.* Mitigation Measure NOISE-1 would reduce this impact to *be* ***less than significant.***

Initial Project Assessment

Impact 4.10-1b: Would implementation of the **initial activities** result in exposure of persons to or the generation of noise levels in excess of standards established in the local General Plan or noise ordinance or applicable standards of other agencies?

Initial Activities (Impact 4.10-1b)

As discussed in Section 3.7, *Initial Activities*, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The initial activities listed above and described in Section 3.7 of this PEIR would involve soil excavation and disposal, building demolition, and/or maintenance activities in certain portions of project site. Equipment used for the overall site cleanup would also be used for the initial projects. As discussed earlier for Impact 4.10-1a for the overall site cleanup , for the purpose of conducting a conservative analysis, noise levels were estimated for a scenario in which five of the loudest pieces of equipment with the highest usage percentage from the project equipment inventory were assumed to be operating simultaneously at the same location nearest to each of the identified offsite noise-sensitive receptor locations (i.e., existing single-family residential, park, and university uses located around the project site). As shown in Tables 4.10-14 and 4.10-15, the project's construction-related noise levels generated onsite would not exceed the applicable noise standards for most noise-sensitive land uses located offsite in Ventura and Los Angeles Counties. According to Table 4.10-14, noise at Sage Ranch Park would exceed The County of Ventura's threshold for residential uses. However, none of the initial projects would implement excavation or demolition activities within 2,000 feet of the noise sensitive uses at Sage Ranch Park (ranger's house and campsites). At 2,000 feet from the excavation and demolition activities, the sound level at the park's ranger's house and campsites would reach approximately 47.2 dBA, which is below the applicable County of Ventura noise threshold. Therefore, impacts would be less than significant.

Conclusion: The initial activities would not generate noise levels that would exceed the applicable noise standards established by Ventura and Los Angeles Counties for noise-sensitive land uses that are located nearest to the project site. This impact would be less than significant.

Impact 4.10-1b Determination: *The **initial activities** would not result in exposure of persons to or the generation of noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards or other agencies. Therefore, this impact would be **less than significant**.*

4.10.5.2. Ground-borne Vibration or Ground-borne Noise Levels

Program Assessment

Impact 4.10-2a: Would implementation of the **overall site cleanup** result in exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?

Overall Site Cleanup (Impact 4.10-2a)

Project cleanup activities would have the potential to generate low levels of ground-borne vibration as the operation of heavy off-road equipment (dozers, loaders, drill rigs, backhoes, haul trucks, etc.) would generate vibrations that propagate though the ground (although the vibrations diminish in intensity with distance from the source). No high-impact activities, such as pile-driving or blasting, would be required as part of the cleanup activities.

The various PPV vibration velocities for several types of equipment, along with their corresponding RMS velocities (in VdB), that can generate perceptible vibration levels are identified in **Table 4.10-16**. As shown, vibration velocities could range from 0.003 to 0.089 in/sec PPV at 25 feet from the source of activity.

TABLE 4.10-16
VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

	Approximate PPV (in/sec)					Approximate RMS (VdB)				
Equipment	25 Feet	50 Feet	100 Feet	150 Feet	200 Feet	25 Feet	50 Feet	100 Feet	150 Feet	200 Feet
Large Bulldozer	0.089	0.031	0.011	0.006	0.004	87	78	69	64	60
Hoe Ram	0.089	0.031	0.011	0.006	0.004	87	78	69	64	60
Caisson Drilling	0.089	0.031	0.011	0.006	0.004	87	78	69	64	60
Loaded Trucks	0.076	0.027	0.010	0.005	0.003	86	77	68	63	59
Jackhammer	0.035	0.012	0.004	0.002	0.0015	79	70	61	56	52
Small Bulldozer	0.003	0.001	0.0004	0.0002	0.0001	58	49	40	35	31

SOURCE: FTA, 2006.

The nearest offsite sensitive receptors to the project site that would be exposed to vibration levels generated from project cleanup activities include the American Jewish University campus and single-family residential uses that surround the project site. Similar to the noise analysis conducted under Impact Statement 4.10-1a, the vibration levels were estimated at the nearest offsite sensitive receptors based on the distance between each receptor and the project site. For this analysis, it was assumed that vibration levels associated with a large bulldozer, which is among the equipment that generate the highest vibration levels shown in Table 4.10-16, would occur at the nearest edge of the project site located closest to each of the offsite sensitive receptors. **Table 4.10-17** shows the estimated construction-related ground-borne vibration levels that could occur at the nearest offsite receptors during project cleanup activities.

TABLE 4.10-17
GROUND-BORNE VIBRATION LEVELS AT OFFSITE SENSITIVE USES

Offsite Sensitive Land Uses[a]	Approximate Distance to Nearest Project Work Area (feet)[b]	Estimated PPV (in/sec)	Estimated Construction-Related Ground-Borne Vibration Levels (VdB)
American Jewish University campus structures located north of the project site	4,200	0.00004	20.24
Sage Ranch Park including ranger's house and camping sites	1,100	0.00030	37.70
Summit Mobile Home Community residential homes located approximately one-quarter mile east of the project site	3,200	0.00006	23.78
Single-family residences located south of the project site in the Bell Canyon residential community along Wrangler Lane	4,600	0.00004	19.06
Single-family residences located south of the project site in the Bell Canyon residential community along Hacienda Road	2,900	0.00007	25.07
Single-family residences located south of the project site in the Bell Canyon residential community along Saddlebow Road	2,000	0.00012	29.91

NOTES:
in/sec = inches per second.

[a] The trail of Sage Ranch Park is not considered as vibration sensitive.
[b] The distance is from the offsite receptor to the nearest work area at the project site where cleanup activities would occur.

Source: ESA, 2017d (see Appendix I of this PEIR).

As shown in Table 4.10-17, the vibration velocities forecasted to occur at the nearest offsite sensitive receptors would range from than 0.00004 in/sec PPV at the American Jewish University campus to 0.00030 in/sec PPV at Sage Ranch Park. For this analysis, the identified offsite single-family residential structures surrounding the project site are considered to be "non-engineered timber and masonry buildings" and the structures at the American Jewish University campus are considered to be "engineered concrete and masonry" buildings based on FTA's building categories as shown in Table 4.10-4. Based on the information shown in Table 4.10-17, none of the nearby offsite residential or university campus structures surrounding the project site would be exposed to a PPV ground-borne vibration level that exceeds 0.2 in/sec or 0.3 in/sec,

respectively, during the operation of equipment for project cleanup activities. Thus, the vibration levels generated by overall project cleanup would not result in building damage at the nearby offsite structures, and impacts would be less than significant.

In terms of human annoyance, the vibration levels forecasted to occur at the offsite sensitive receptors would range from approximately 20 VdB at the American Jewish University campus located northwest of the project site, to 37 VdB at the Summit Mobile Home Community residential homes located east of the project site, as shown in Table 4.10-17. As such, the vibration levels generated by equipment at the project site would not exceed the FTA's 80 VdB and 83 VdB criteria for residences or places where people may sleep and institutional land uses, respectively, at the nearest offsite sensitive receptors. As such, vibration impacts associated with human annoyance at the nearest offsite sensitive receptors resulting from project cleanup activities would be less than significant.

Additionally, the residential facilities at the Summit Mobile Home Community are located within the county of Los Angeles. As discussed previously, Section 12.08.560 of the Los Angeles County Noise Ordinance prohibits the operation of any device that creates vibration above the vibration perception threshold of any individual at 150 feet (46 meters) from the source if on a public space or public right-of-way. The County Noise Ordinance identifies a presumed perception threshold of 0.01 in/sec. While project equipment operating within the project site would not be located on a public space or public right-of-way and would operate beyond 150 feet from the Summit Mobile Home Community, the loaded haul trucks leaving the project site and traveling on Woolsey Canyon Road would be subject to this 0.01 in/sec threshold. Rubber-tire vehicles rarely result in substantial ground-borne vibration unless there is a discontinuity or bump in the road that causes the vibration (FTA, 2006). Nonetheless, as presented in Table 4.10-16, loaded trucks would, where discontinuities or bumps are present on a roadway, generate vibration levels of 0.076 in/sec PPV at 25 feet to 0.011 in/sec PPV at 100 feet. At a distance of 150 feet, the vibration levels generated by loaded trucks would be reduced to approximately 0.005 in/sec PPV. Thus, at a distance of 150 feet from the source, the vibration levels generated by loaded trucks traveling on Woolsey Canyon Road (should they encounter bumps on the road) would not exceed the County of Los Angeles' 0.01 in/sec perception threshold. Therefore, impacts would be less than significant.

> Conclusion: The overall site cleanup would not generate vibration levels that would exceed the applicable vibration criteria established by the County of Los Angeles and by the FTA, which is recommended in the Ventura County Initial Study Assessment Guidelines. Vibration-related impacts associated with building damage and human annoyance would be less than significant and no mitigation is required.

Impact 4.10-2a Determination: *The* ***overall site cleanup*** *would not result in exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels. This impact would be* ***less than significant****.*

Initial Project Assessment

Impact 4.10-2b: Would implementation of the **initial activities** result in exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?

Initial Activities (Impact 4.10-2b)

As discussed in Section 3.7, *Initial Activities*, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The projects listed above and described in Section 3.7 of this PEIR would involve soil excavation and disposal, building demolition, and/or maintenance activities in certain portions of the project site. The equipment used for the overall site cleanup would also be used for the initial activities. As discussed earlier for Impact 4.10-2a for the overall site cleanup, vibration levels were estimated at the nearest offsite sensitive receptors based on the distance between each receptor and the respective nearest project work area. As shown in Table 4.10-17, project-related vibration levels generated onsite would not exceed the applicable vibration criteria established by the FTA for building damage or human annoyance at the nearest offsite sensitive receptors. Additionally, it was determined that the residential facilities at the Summit Mobile Home Community, which are located within the county of Los Angeles, would also not be exposed to vibration levels generated by loaded trucks traveling on Woolsey Canyon Road (should they encounter bumps on the road) that would exceed the County of Los Angeles' 0.01 in/sec perception threshold. Therefore, vibration impacts resulting from the initial activities would be less than significant.

> Conclusion: The initial activities would not generate vibration levels that would exceed the applicable vibration criteria established by the County of Los Angeles and by the FTA, which is recommended in the Ventura County Initial Study Assessment Guidelines. Vibration-related impacts associated with building damage and human annoyance would be less than significant and no mitigation is required.

Impact 4.10-2b Determination: *The* ***initial activities*** *would not result in exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels. This impact would be* ***less than significant****.*

4.10.5.3. Increase in Ambient Noise Levels

Program Assessment

Impact 4.10-3a: Would implementation of the **overall site cleanup** result in a temporary/ periodic or substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Overall Site Cleanup (Impact 4.10-3a)

Onsite Noise Levels

As discussed previously in Section 4.10.5.1 and shown in **Table 4.10-18**, the estimated noise levels at the nearest offsite sensitive uses during overall site cleanup would range from approximately 38.6 dBA L_{eq} at the American Jewish University campus to 54.1 dBA L_{eq} at the noise-sensitive uses located within Sage Ranch Park. Over the course of a day, the highest noise levels would be generated when multiple pieces of equipment are being operated concurrently.

TABLE 4.10-18
ESTIMATED NOISE LEVELS AT OFFSITE SENSITIVE USES DURING CLEANUP ACTIVITIES

Offsite Sensitive Land Uses	Approximate Distance to Nearest Project Work Area (ft.) [a]	Existing Noise Levels (dBA, L_{eq}) (A)	Estimated Average Cleanup Activity Noise Levels (dBA, L_{eq}) [b] (B)	Existing + Project (dBA, L_{eq}) [c] (C)	Increase Over Existing (dBA, L_{eq}) [d] (C) – (A)	Exceeds Threshold?
American Jewish University campus	4,200	50.0[e]	38.6	50.3	0.3	No
Sage Ranch Park[h]	1,100	50.0[e]	54.1	55.5	5.5	Yes
Summit Mobile Home Community residences	3,200	56.6[f]	41.8	56.7	0.1	No
Single-family residences located south of the project site in the Bell Canyon residential community along Wrangler Lane	4,600	49.2[g]	37.6	49.5	0.3	No
Single-family residences located south of the project site in the Bell Canyon residential community along Hacienda Road	2,900	49.2[g]	42.9	50.1	0.9	No
Single-family residences located south of the project site in the Bell Canyon residential community along Saddlebow Road	2,000	49.2[g]	47.2	51.3	2.1	No

a The distance is from the offsite receptor to the nearest onsite work area.
b The estimated noise levels at each offsite receptor take into account the concurrent operation of five pieces of equipment at the same location.
c Logarithmic summation of Existing and Estimated Average Cleanup Activity Noise levels.
d This value was calculated by subtracting the values in column C from the values in column A).
e Due to the lack of the measurement data, the existing noise level was defined as 50 dBA based on "Quiet Urban Daytime" noise level defined in the Table 2-5 of Caltrans Technical Noise Supplement (Caltrans, 2013a).
f This level is the same as ST4 measurement included in Table 4.10-2.
g Those noise levels are based on the average of ST1, ST2, and ST3 from the Table 4.10-2. Since the measurement duration was 30 minutes and ST1/2/3 were in the similar environment, the average noise level of those three measurements was used as the existing noise level.
h Noise-sensitive uses include ranger's house, camping sites, and amphitheater.

Source: ESA, 2017d (see Appendix I of this PEIR).

As shown in Table 4.10-18, most of the nearest offsite facilities where noise-sensitive receptors are located would not experience an increase of 3 dBA within the county of Ventura or 5 dBA within the county of Los Angeles and the city of Los Angeles over the existing noise level. However, the ranger's house and campsites at Sage Ranch Park would experience a 5.5 dBA increase, which exceeds The County of Ventura's threshold. Mitigation Measure NOISE-1 would reduce ambient noise at the ranger's house and campsites after 7:00 p.m., however, daytime cleanup activities would also result in a 5.5 dBA increase in ambient noise. Mitigation Measure NOISE-2 requires the installation of temporary sound barriers to block the line-of-site between the work areas in the northern portion of Area I from the Sage Ranch Park ranger's house and campsites. The sound barrier would reduce sound by 5 dBA to 10 dBA which would reduce this impact to less than significant with mitigation incorporated (FHWA, 2011). The park has a trail loop, which runs directly adjacent the project site. Given the proximity of this trail to onsite remediation areas, equipment could be located within 50 feet. The noise level at 50 feet would be greater than 5.5 dBA increase over the ambient noise level. However, the County of Ventura does not define a noise level threshold for the trail. Therefore, the project would result in no noise impact to the trail or other park users that do not stay at the park overnight. Onsite noise generated by the cleanup activities would be temporary and would occur at different locations on the site throughout the 15-year duration of the project, and would cease upon completion of the cleanup activities.

> Conclusion: Therefore, the cleanup activities would not result in a permanent increase in ambient noise levels. Thus, impacts associated with a substantial increase in ambient noise levels as a result of the overall site cleanup would be less than significant.

Offsite Traffic Noise Levels

As part of the project cleanup, it is estimated that the daily maximum number of trucks visiting the site for export and import of materials would be 96 round trips (resulting in 192 total one-way trips) in total for all RPs combined. This maximum would represent all types of truck trips, including equipment deliveries, excavation spoils, building demolition debris, and delivery of backfill soil.

Project-related haul trucks would travel to SR 118 or US 101 via the following routes (refer to Figure 3-7):

- Woolsey Canyon Road to Valley Circle Boulevard to Roscoe Boulevard to Topanga Canyon Boulevard (SR 27) to SR 118
- Woolsey Canyon Road to Valley Circle Boulevard to Lake Manor Drive to Valley Circle Boulevard to Plummer Street to Topanga Canyon Boulevard (SR 27) to SR 118
- Woolsey Canyon Road to Valley Circle Boulevard to US 101
- Woolsey Canyon Road to Valley Circle Boulevard to Roscoe Boulevard to Topanga Canyon Boulevard (SR 27) to US 101

Based on the traffic study prepared for the project (see Appendix H of this PEIR), in addition to the maximum number of 96 trucks (round trips, resulting in 192 total one-way trips) that would visit the project site on a daily basis, a total of approximately 250 daily vehicles (500 total one-way trips) associated with workers also are estimated (KOA, 2017). These additional worker trips are anticipated to travel along the truck routes identified above as well as on other local roadways in the vicinity of the project site.

To assess the potential traffic-related noise impacts resulting from the project, the baseline traffic noise levels and future year 2032 with project conditions are compared.

The estimated peak-hour roadway noise levels resulting from the addition of project-related traffic are shown in **Table 4.10-19** and **Figure 4.10-5** shows the location of the modeled roadway segments.

As shown in Table 4.10-19, with the exception of the roadway segment of Woolsey Canyon Road, between Valley Circle Boulevard and Knapp Ranch Road and Facility Road at Woolsey Canyon Road, with the addition of project-related truck traffic, all study roadway segments would experience increases in noise levels of less than 3 or 5 dBA over existing conditions. Thus, noise impacts related to traffic noise levels on these roadways would be less than significant. However, because the addition of project-related truck and worker vehicle trips would increase the peak-hour noise levels on Facility Road at Woolsey Canyon Road and Woolsey Canyon Road, between Valley Circle Boulevard and Knapp Ranch Road, by 5.3 and 7.5 dBA L_{eq}, respectively, a potential impact related to a substantial increase in noise levels above ambient conditions would occur for receptors near these roadways.

The traffic noise increase on this roadway is due to these roadways being the designated access point to the project site. Because of the low volume of vehicles that currently travel on this roadway, the addition of project-related truck trips along with worker trips would result in a readily perceptible increase in noise levels. The increase in traffic noise levels on these roadways would be a direct result of project-related traffic, mainly due to the trucks. , and there is no feasible mitigation available to reduce this impact to less than significant.

While implementation of Mitigation Measure NOISE-3 would require construction of noise barriers along Facility Road and Woolsey Canyon Road, it may not be feasible, practical, or acceptable to construct a noise barrier for the duration of the project, due to objection by property owners and other constraints. However, the 192 total daily truck trips would only occur on peak construction days, while on most days, a smaller number of trucks would be used to transport materials to and from the project site. Nonetheless, on peak construction days when the maximum number of 192 truck trips travel to and from the project site, a substantial temporary increase in traffic noise levels on these roadways would occur. Therefore, this traffic noise impact would be considered significant and unavoidable.

TABLE 4.10-19
PEAK HOUR ROADWAY NOISE LEVELS WITH PROJECT – MAXIMUM (96) TRUCKS

Roadway Segment	Noise Levels in dBA L_{eq}(hourly)[a] Baseline (2015) Traffic Volumes	Future (2032) With Project Traffic Volumes	Increase	Significance Threshold [b]	Exceeds Threshold?
Box Canyon Road, between Santa Susana Pass Road and Roberson Road	55.5	56.3	0.8	3.0	No
Santa Susana Pass Road, between Rocky Peak Road and Box Canyon Road	54.1	54.9	0.8	3.0	No
Woolsey Canyon Road, between Valley Circle Boulevard and Knapp Ranch Road	54.7	62.2	7.5	5.0	Yes[d]
Valley Circle Boulevard, between Box Canyon Road and Woolsey Canyon Road	55.6	56.7	1.1	5.0	No
Valley Circle Boulevard, between Plummer Street and Schumann Road	59.4	60.5	1.1	5.0	No
Plummer Street, between Valley Circle Boulevard and Farralone Avenue	61.4	62.5	1.1	5.0	No
Valley Circle Boulevard, between Woolsey Canyon Road and Chatlake Drive	60.6	62.2	1.6	5.0	No
Roscoe Boulevard, between Woodlake Avenue and Shoup Avenue	64.3	65.7	1.4	5.0	No
Roscoe Boulevard, between Shoup Avenue and Farralone Avenue	68.4	69.4	1.0	5.0	No
Valley Circle Boulevard, between Vanowen Street and Victory Boulevard	68.9	69.7	0.8	5.0	No
Valley Circle Boulevard, between Burbank Boulevard and US 101	69.1	70.0	0.9	5.0	No
Facility Road at Woolsey Canyon Road[c]	30.2	35.5	5.3	3.0	Yes
Topanga Canyon Boulevard, north of Plummer Street	71.6	72.3	0.7	5.0	No
Topanga Canyon Boulevard, between Plummer Street and Roscoe Boulevard	71.9	72.2	0.3	5.0	No
Topanga Canyon Boulevard, south of Roscoe Boulevard	69.2	70.3	1.1	5.0	No

NOTES:

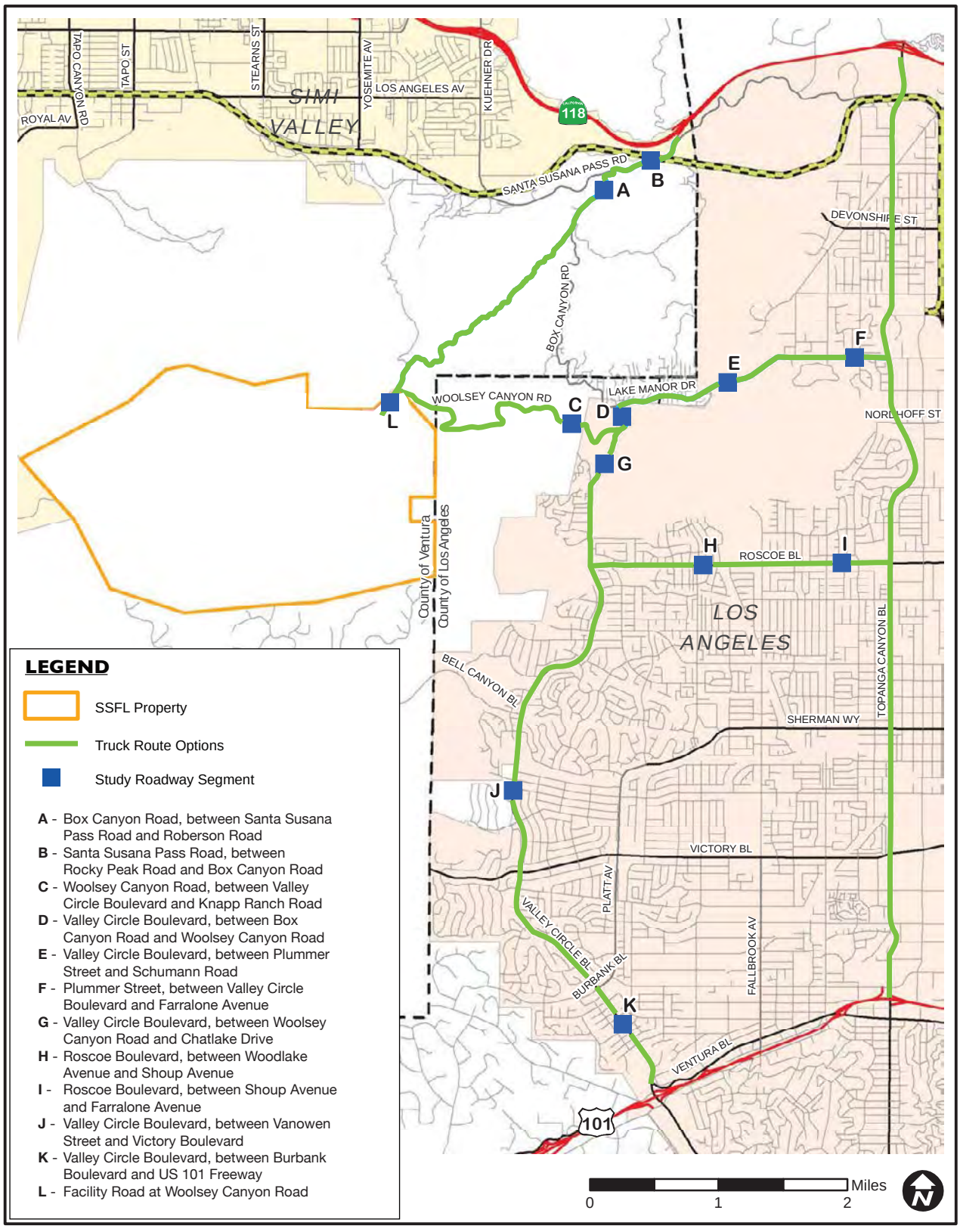
[a] Values represent noise levels at 100 feet from the centerline of the roadway.

[b] As discussed under Section 4.10.2, *Thresholds of Significance*, for the purpose of this analysis a substantial increase in traffic noise levels would occur if the project's haul truck and worker vehicle trips would contribute to a traffic noise level increase of 3 dBA or greater over existing ambient noise levels within the county of Ventura and 5 dBA or greater over existing ambient noise levels within the county of Los Angeles and the city of Los Angeles.

[c] Noise levels for this roadway are based on the distance of 1,300 feet where actual noise sensitive receiver is located and traffic volumes are the same as Woolsey Canyon Road due to the lack of information.

[d] Because the grade of Woolsey Canyon Road exceeds 5 percent, TNM was used to estimate noise levels, which were the average of 20 front row house locations at Summit Mobile Home Community.

SOURCE: KOA, 2017 (see Appendix H of this PEIR); ESA, 2017d (see Appendix I of this PEIR).



SOURCE: KOA Corporation, 2016

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Figure 4.10-5

Modeled Roadway Segments

Conclusion: The overall site cleanup would result in a substantial increase in noise levels at the Sage Ranch Park ranger's house and campsites during cleanup activities. Implementation of Mitigation Measure NOISE-2, which requires installation of noise barriers with sufficient height to block a line-of-sight, would reduce noise at the ranger's house and campsites so that impacts would be less than significant. The project would also result in a substantial increase in traffic offsite noise levels at the roadway segments of Facility Road at Woolsey Canyon Road and Woolsey Canyon Road between Valley Circle Boulevard and Knapp Ranch Road during peak construction days when a daily maximum of 96 round trips (resulting in 192 total one-way trips) would occur. This would result in a significant impact. Implementation of Mitigation Measure NOISE-3 requires the construction of noise barriers with sufficient height to block a line-of-sight, which would reduce the offsite traffic noise impacts on sensitive receptors along Facility Road and Woolsey Canyon Road. However, the construction of noise barriers of this scale for the entire 15-year duration of the project may not be feasible, practical, or acceptable to the noise-sensitive users in certain locations. Therefore, this impact would be considered significant and unavoidable.

Impact 4.10-3a Determination: *The* ***overall site cleanup*** *would result in a substantial increase in construction and traffic noise levels above ambient conditions. Mitigation Measures NOISE-2 and NOISE-3 would require the installation of temporary noise barriers as practical. However, because construction of noise barriers of this scale for the entire 15-year duration of the project may not be feasible, practical, or acceptable to the noise-sensitive users in certain locations, this impact would be* ***significant and unavoidable****.*

Initial Project Assessment

Impact 4.10-3b: Would implementation of the **initial activities** result in a temporary/periodic or substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Initial Activities (Impact 4.10-3b)

As discussed in Section 3.7, *Initial Activities*, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

Onsite Noise Levels

As presented in Table 4.10-18, with the exception of Sage Ranch Park, none of the nearest offsite facilities where noise-sensitive receptors are located would experience an increase of 3 dBA within the county of Ventura or 5 dBA within the county of Los Angeles and the city of Los Angeles over the existing noise level. None of the initial projects include activities within 2,000 feet of the ranger's house or campsites. At 2,000 feet from the cleanup activities, it is estimated that the ranger's house and campsites would experience an approximate 2.1 dBA increase over the ambient sound level, which is below the County of Ventura threshold (ESA, 2017d [see Appendix I]). The park has a trail loop, and equipment would be located within 50 feet of the trail. The noise level at 50 feet would be greater than 5.5 dBA increase over the ambient noise level. However, the County of Ventura does not define the noise level threshold for the trail or park users who do not stay overnight. Therefore, the project would result in a less than significant impact to the park and trail users. Thus, impacts associated with a substantial increase in ambient noise levels as a result of the initial activities would be less than significant.

Offsite Traffic Noise Levels

Under the initial activities, the daily maximum number of trucks visiting the site for export and import of materials would be 96 round trips (resulting in 192 total one-way trips). As these truck trips would be the same as those analyzed for the overall site cleanup, the traffic noise impacts would also be the same. As discussed previously, a maximum of 96 daily trucks would result in 5.3 and 7.5 dBA L_{eq} increase in peak-hour noise levels on the roadway segment of Facility Road at Woolsey Canyon Road and Woolsey Canyon Road, between Valley Circle Boulevard and Knapp Ranch Road (refer to Table 4.10-19), respectively. As such, a potential impact related to a substantial increase in noise levels above ambient conditions would occur on these roadways. All of the other analyzed roadway segments would experience an increase in traffic noise levels of less than 3 or 5 dBA. Overall, the traffic noise impact on Facility Road and Woolsey Canyon Road would be significant and unavoidable.

> Conclusion: The initial activities would not result in a substantial increase in noise levels at the nearest offsite sensitive receptors during onsite project cleanup activities. However, the initial activities would result in a substantial increase in traffic noise levels offsite at the roadway segments of Facility Road at Woolsey Canyon Road and Woolsey Canyon Road, between Valley Circle Boulevard and Knapp Ranch Road, above ambient noise levels during peak construction days when a daily maximum of 96 round trips (resulting in 192 total one-way trips) would occur. Because the increase in traffic noise levels on these roadways is directly correlated to the amount of truck trips that would travel along that roadway during project cleanup activities no feasible mitigation is available to reduce this offsite traffic noise impact. Mitigation Measure NOISE-3 requires the installation of temporary noise barriers with sufficient height to block a line-of-sight to reduce the offsite traffic noise impacts on receivers along Facility Road and Woolsey Canyon Road. However, the construction of noise barriers may not be feasible, practical, or desirable to the noise-sensitive uses, due to property owner objection and other constraints. Therefore, this traffic noise impact would be significant and unavoidable.

Impact 4.10-3b Determination: *The **initial activities** would result in a substantial increase in traffic noise levels above ambient conditions during peak construction days when a maximum of 96 truck round trips (resulting in 192 total one-way trips) would occur. Mitigation Measure NOISE-3 would require the installation of temporary noise barriers as practical. However, because construction of noise barriers of this scale for the entire duration of the project may not be feasible, practical, or acceptable to the noise-sensitive users in certain locations, this impact would be **significant and unavoidable**.*

4.10.6 Mitigation Measures

The following measures have been included to mitigate noise impacts associated with cleanup activities:

NOISE-1: Cleanup activities within 1,000 feet of the northern boundary of Area I shall be prohibited between the hours of 7:00 p.m. to 7:00 a.m. Monday through Friday, and from 7:00 p.m. to 9:00 a.m., Saturday, Sunday, and local holidays. Figure 4.10-4 shows the location of the 1,000-foot nighttime avoidance area.

NOISE-2: Temporary noise barriers shall be used, as feasible, to block the line-of-site between the Sage Ranch Park ranger's house and campsites (located north of Area I). The height of the noise barriers must be sufficient to block the line-of-sight.

NOISE-3: Temporary noise barriers shall be used, as feasible, to block the line-of-site between the hauling trucks and noise sensitive receivers along Woolsey Canyon Road and Facility Road. The noise barrier height must be sufficient to block the line-of-sight.

4.10.7 Impact Summary

Table 4.10-20 summarizes the noise impacts and significance determinations related to the cleanup activities.

TABLE 4.10-20
SUMMARY OF IMPACTS – NOISE

Impacts	Overall Project	DOE Initial Project	NASA Initial Project	DOE Demolition Activities	RCRA Post-Closure and Facility Closure	Mitigation Measures
Impact 4.10-1a: Conflicts with General Plan or noise ordinance	LSM	--	--	--	--	NOISE-1
Impact 4.10-1b: Conflicts with General Plan or noise ordinance	--	LTS	LTS	LTS	LTS	None
Impact 4.10-2a: Ground-borne vibration or ground-borne noise levels	LTS	--	--	--	--	None
Impact 4.10-2b: Ground-borne vibration or ground-borne noise levels	--	LTS	LTS	LTS	LTS	None
Impact 4.10-3a: Increase in ambient noise levels	S&U	--	--	--	--	NOISE-2 and NOISE-3
Impact 4.10-3b: Increase in ambient noise levels	--	S&U	S&U	S&U	S&U	NOISE-3

LTS = Less than significant impact
LSM = Less than significant with mitigation incorporated
S&U = Significant and unavoidable impact

4.11 Transportation and Traffic

This section evaluates the potential for the overall site cleanup and the initial activities to result in impacts relative to roadway traffic and traffic safety. Existing conditions and applicable regulations are described, as well as the potential for increased truck activity and work crew vehicle trips to adversely affect intersection and roadway levels of service (LOS) compared to the LOS standards established by the affected jurisdictions (cities of Los Angeles and Simi Valley, and Los Angeles County). This section is based on the analysis and conclusions of the *Traffic Study for Santa Susana Field Laboratory EIR*, prepared by KOA Corporation (March 2017), which is presented in Appendix H of this PEIR.

Due to public concern about environmental impacts related to the use of trucks to transport soil to and from the project site via Woolsey Canyon Boulevard, DTSC evaluated the technical and environmental feasibility of several alternative routes and methods of transporting soil from the site to disposal facilities. The *Santa Susana Field Laboratory Transportation Feasibility Analysis* (presented in Appendix J of this PEIR) evaluated several alternative transport options, including construction of a new road for use as a haul route for trucks, use of conveyors to transport soil to a new truck loading facility in Simi Valley, and use of conveyors to transport soil to a new rail loading facility in Simi Valley on the north side of the project site. As presented in Appendix J, transporting soil by truck via Woolsey Canyon Road was the most technically feasible and least environmentally impactful option, and thus is the option that is evaluated in this PEIR.

4.11.1 Environmental Setting

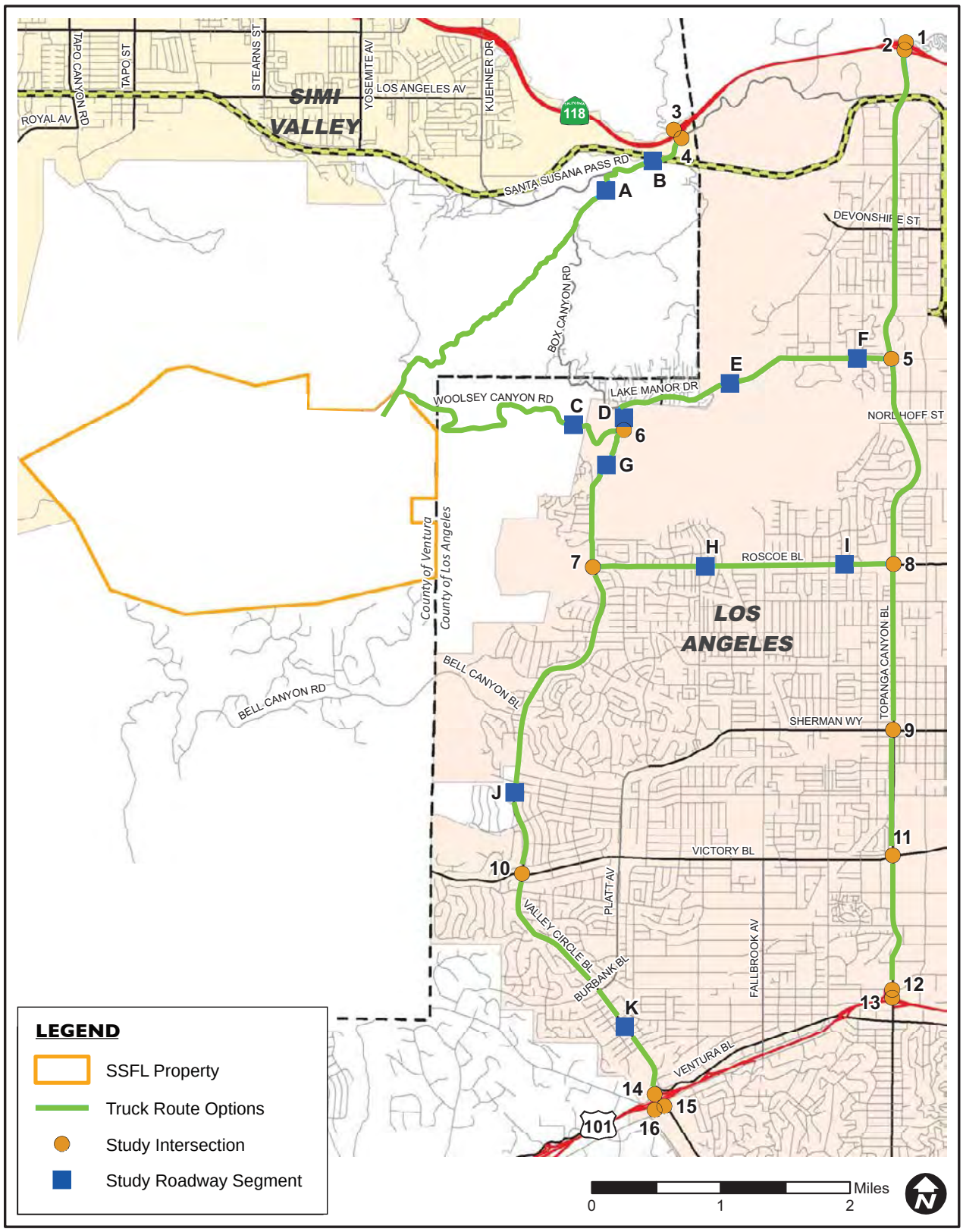
4.11.1.1 Existing Conditions

Existing Roadways

The following discussion summarizes the existing regional and local roadways in the project area (see **Figure 4.11-1** and **Table 4.11-1**). These are the main roadways that trucks and work crew members associated with the proposed project would use to access the project site.

Regional Roads

- **State Route (SR) 118** is an east-west freeway, approximately 3 miles north of the project site, with 10 lanes near the project site. SR 118 connects with Interstate 210 (I-210) to the east and terminates at the SR 126 interchange to the west. According to the most recent data published by the California Department of Transportation (Caltrans), the average daily traffic volume on SR 118 at the SR 27 / Topanga Canyon Boulevard interchange is about 117,000 to 128,000 vehicles (Caltrans, 2015a).
- **U.S. Route 101 (US 101)** has an east-west alignment in the vicinity of the project site (5 miles to the south of the site) and is an 8- to 10-lane freeway. According to the most recent data published by Caltrans, the average daily traffic volume on US 101 at the SR 27/Topanga Canyon Boulevard interchange is about 200,000 to 222,000 vehicles (Caltrans, 2015a).



SOURCE: KOA Corporation, 2016

Santa Susana Field Laboratory . 120894

Figure 4.11-1
Project Study Area

TABLE 4.11-1
EXISTING CHARACTERISTICS OF STUDY AREA ROADWAY SYSTEM

	Roadway	From	To	Functional Classification	Travel Lanes	Divided?	Parking Allowed?	Speed Limit
A	Box Canyon Road	Santa Susana Pass Road	Roberson Road	Collector	2	NO	NO	30
B	Santa Susana Pass Road	Rocky Peak Road	Box Canyon Road	Minor Arterial	2	NO	NO	30
C	Woolsey Canyon Road	Valley Circle Boulevard	Knapp Ranch Road	Local	2	NO	NO	30
D	Valley Circle Boulevard	Box Canyon Road	Woolsey Canyon Road	Collector	2	NO	NO	20
E	Valley Circle Boulevard	Plummer Street	Schumann Road	Collector	2	NO	NO	40
F	Plummer Street	Valley Circle Boulevard	Farralone Avenue	Collector	2	YES [a]	NO	35
G	Valley Circle Boulevard	Woolsey Canyon Road	Chatlake Drive	Collector	2	NO	NO	35
H	Roscoe Boulevard	Woodlake Avenue	Shoup Avenue	Major Arterial	4	YES [a]	YES	40
I	Roscoe Boulevard	Shoup Avenue	Farralone Avenue	Major Arterial	4	YES [a]	YES	40
J	Valley Circle Boulevard	Vanowen Street	Victory Boulevard	Major Arterial	4	YES [a]	One Side Only	45
K	Valley Circle Boulevard	Burbank Boulevard	US 101	Major Arterial	4	YES [a]	Portions [b]	35 / 40

[a] "YES" refers to the roadways being divided by a center left-turn lane.
[b] "Portions" refers to varied parking restrictions along roadway segment.

SOURCE: KOA Corporation, 2017 (see Appendix H of this PEIR).

- **SR 27/Topanga Canyon Boulevard** is a north-south surface highway, approximately 4 miles east of the project site. SR 27 connects with SR 118 to the north and SR 101 (and beyond, to SR 1) to the south. Near the project site, SR 27 is generally a six-lane roadway. According to the most-recent data published by Caltrans, the average daily traffic volume at the intersection with Roscoe Boulevard is about 32,000 to 46,000 vehicles (Caltrans, 2015a).

Local Access Roads

Table 4.11-1 provides a summary of the existing characteristics of study area roadways (Box Canyon Road, Santa Susana Pass Road, Woolsey Canyon Road, Valley Circle Boulevard, Plummer Street, and Roscoe Boulevard). Within individual segments, some characteristics may vary.

Existing Traffic Conditions

Study Area Intersections and Roadway Segments

The following intersections and roadway segments (see Figure 4.11-1) are included in the traffic study, and are based on anticipated travel routes that would be used by proposed trucks and workers to access the project site. All study intersections are signalized except as indicated in the list below.

Study Intersections

1. Topanga Canyon Boulevard & SR 118 Westbound Ramps (Los Angeles County)
2. Topanga Canyon Boulevard & SR 118 Eastbound Ramps (city of Los Angeles)
3. Rocky Peak Road & SR 118 Westbound Ramps (city of Simi Valley) (*unsignalized – side-street stop-control*)
4. Rocky Peak Road & Santa Susana Pass Road (city of Simi Valley) (*unsignalized – side-street stop-control*)
5. Topanga Canyon Boulevard & Plummer Street (city of Los Angeles)
6. Valley Circle Boulevard & Woolsey Canyon Road (city of Los Angeles) (*unsignalized – all-way stop-control*)
7. Valley Circle Boulevard & Roscoe Boulevard (city of Los Angeles)
8. Topanga Canyon Boulevard & Roscoe Boulevard (city of Los Angeles)
9. Topanga Canyon Boulevard & Sherman Way (city of Los Angeles)
10. Valley Circle Boulevard & Victory Boulevard (city of Los Angeles)
11. Topanga Canyon Boulevard & Victory Boulevard (city of Los Angeles)
12. Topanga Canyon Boulevard & Burbank Boulevard (city of Los Angeles)
13. Topanga Canyon Boulevard & US 101 Northbound Off-Ramp (city of Los Angeles) (*unsignalized – side-street stop-control*)
14. Valley Circle Boulevard & US 101 Northbound Off-Ramp / Long Valley Road (city of Los Angeles)
15. Valley Circle Boulevard & Calabasas Road / Avenue San Luis (city of Los Angeles)
16. US 101 Southbound Ramps & Calabasas Road (city of Los Angeles)

Study Roadway Segments

A. Box Canyon Road: Santa Susana Pass Road to Roberson Road (Los Angeles County)
B. Santa Susana Pass Road: Rocky Peak Road to Box Canyon Road (Los Angeles County / city of Simi Valley)
C. Woolsey Canyon Road: Valley Circle Boulevard to Knapp Ranch Road (Los Angeles County / city of Los Angeles)
D. Valley Circle Boulevard: Box Canyon Road to Woolsey Canyon Road (city of Los Angeles)
E. Valley Circle Boulevard: Plummer Street to Schumann Road (city of Los Angeles)
F. Plummer Street: Valley Circle Boulevard to Farralone Avenue (city of Los Angeles)
G. Valley Circle Boulevard: Woolsey Canyon Road to Chatlake Drive (city of Los Angeles)
H. Roscoe Boulevard: Woodlake Avenue to Shoup Avenue (city of Los Angeles)
I. Roscoe Boulevard: Shoup Avenue to Farralone Avenue (city of Los Angeles)
J. Valley Circle Boulevard: Vanowen Street to Victory Boulevard (city of Los Angeles)
K. Valley Circle Boulevard: Burbank Boulevard to US 101 (city of Los Angeles)

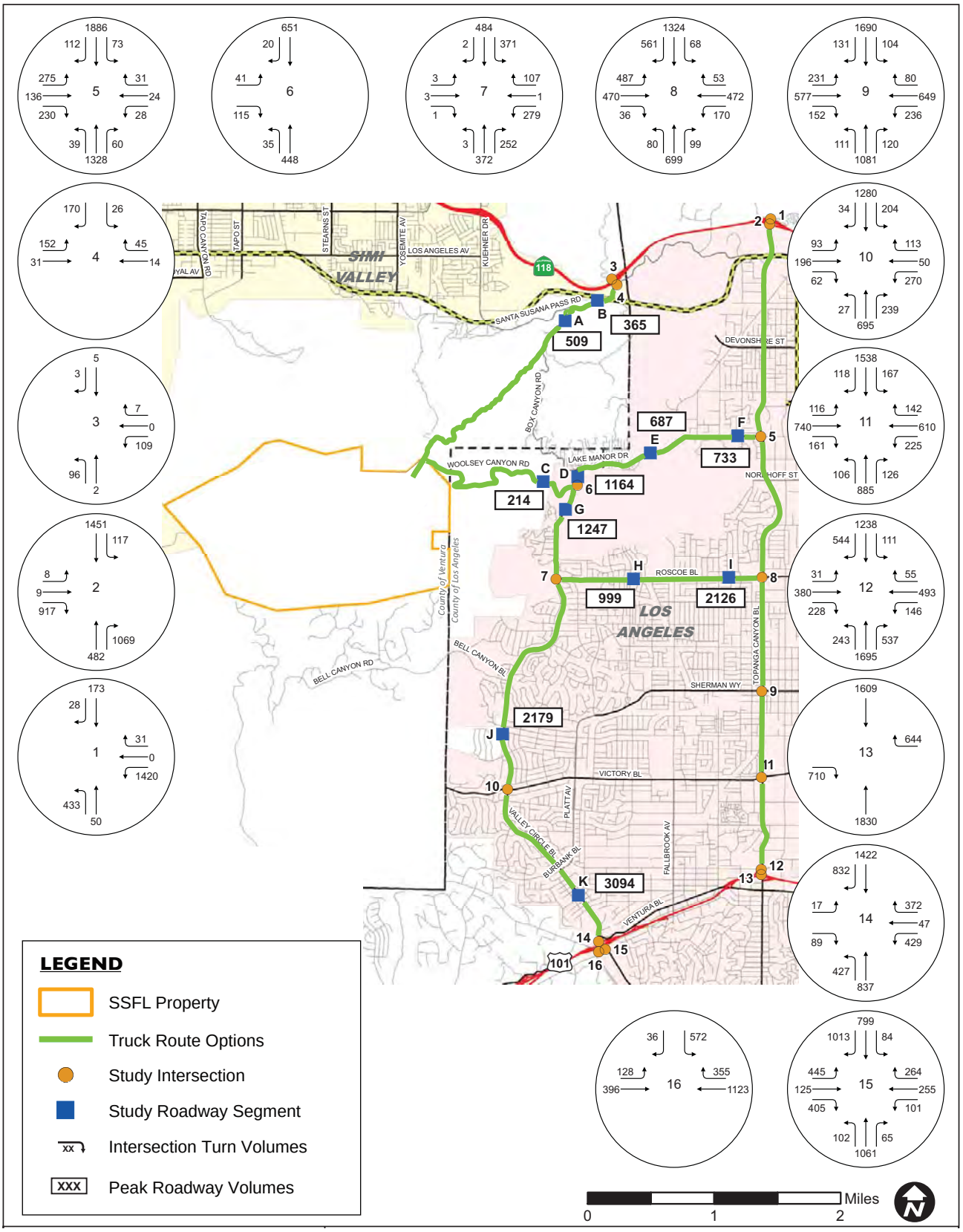
Existing Intersection Operations

Turning movement counts were conducted at study area intersections on Thursday, December 18, 2014; Tuesday, April 28, 2015; and Thursday, June 18, 2015, during the a.m. and p.m. peak periods (7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.). Additional counts were obtained from the Los Angeles Department of Transportation (LADOT) online database for Wednesday, March 5, 2014, during the a.m. and p.m. peak periods. Existing peak-hour traffic volumes are shown in **Figure 4.11-2** (a.m. peak hour) and **Figure 4.11-3** (p.m. peak hour).[1]

LOS is used to characterize traffic operating conditions based on traffic volumes and roadway capacity using a series of six letter designations. Generally, LOS A represents free-flow conditions, and LOS F represents forced-flow or breakdown conditions. The LOS methodology for intersections is described later under "Methodology." **Table 4.11-2** summarizes the results of the intersection capacity analysis for existing conditions at each of the study area intersections. As shown, the following five study intersections currently operate at a poor LOS (LOS E or F) during one or both of the morning and evening peak hours; the remaining 11 intersections operate at LOS D or better during both peak traffic hours:

- #2 (Topanga Canyon Boulevard & SR 118 Eastbound Ramps) operates at LOS F in the both the a.m. and p.m. peak hours
- #6 (Valley Circle Boulevard & Woolsey Canyon Road) operates at LOS E in the a.m. peak hour

[1] The a.m. and p.m. peak hours for each study intersection (i.e., the four highest consecutive 15-minute periods within each of the two-hour peak periods of 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.) vary somewhat (though are generally 7:15 a.m. to 8:15 a.m. and 4:45 p.m. to 5:45 p.m.), but the analysis presented herein provides peak traffic conditions for each single study intersection.



SOURCE: KOA Corporation, 2016

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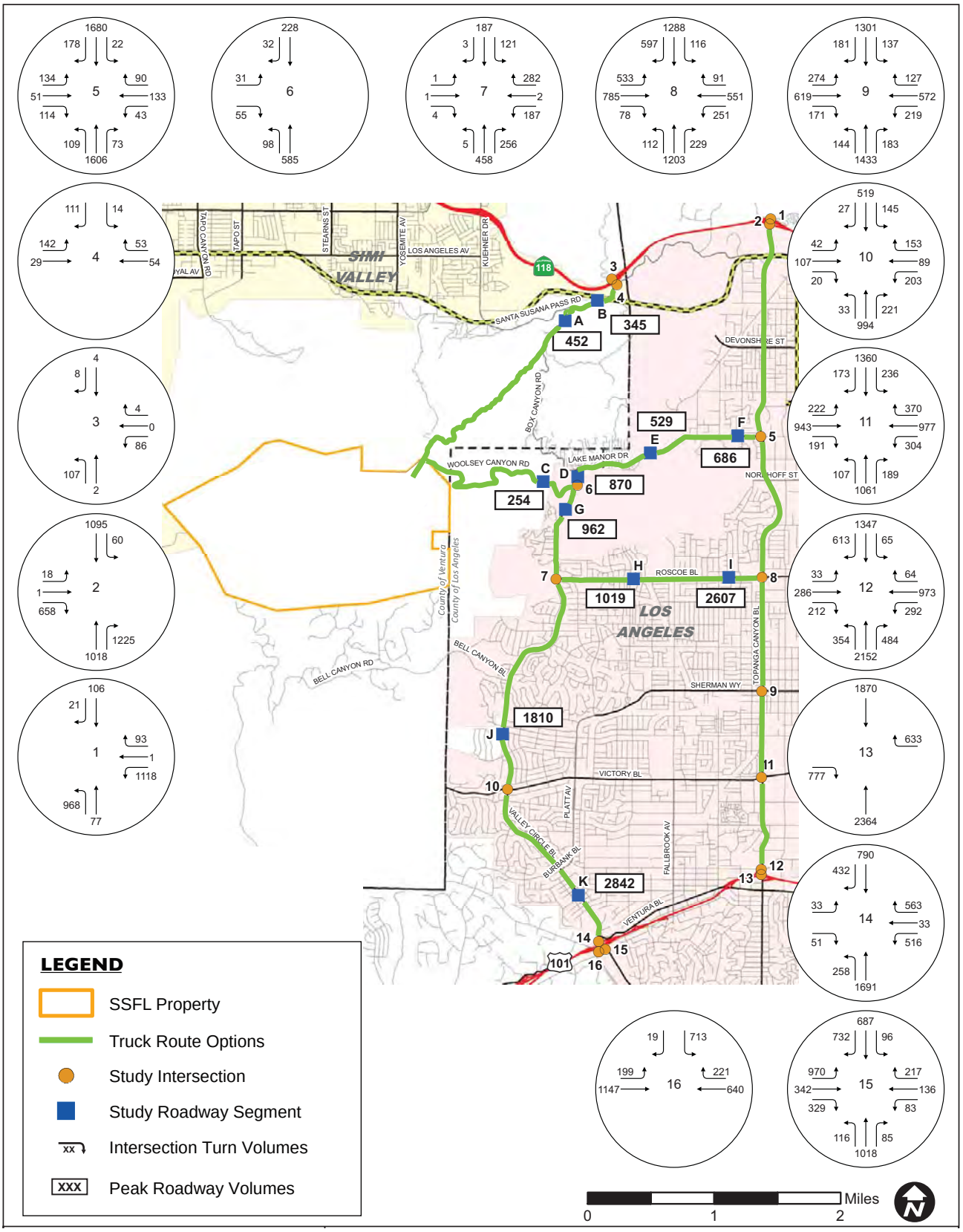
Figure 4.11-2

Existing (2015) AM Peak-Hour Intersection Traffic Volumes



SOURCE: KOA Corporation, 2016

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Figure 4.11-3

Existing (2015) PM Peak-Hour Intersection Traffic Volumes

TABLE 4.11-2
SUMMARY OF EXISTING (2015) LEVEL OF SERVICE (LOS) AT STUDY AREA INTERSECTIONS

Intersection	Traffic Control [a]	AM Peak Hour V/C or Delay [b]	AM Peak Hour LOS	PM Peak Hour V/C or Delay [b]	PM Peak Hour LOS
1. Topanga Canyon Blvd & SR 118 WB[c] Ramps	Signal	0.636	B	0.711	C
2. Topanga Canyon Blvd & SR 118 EB Ramps	Signal	1.086	F	1.056	F
3. Rocky Peak Road & SR 118 WB Ramps	SSSC	10.4	B	10.5	B
4. Rocky Peak Road & Santa Susana Pass Road	SSSC	9.9	A	9.7	A
5. Topanga Canyon Blvd & Plummer Street	Signal	0.699	B	0.631	B
6. Valley Circle Blvd & Woolsey Canyon Road	AWSC	38.9	E	30.0	D
7. Valley Circle Blvd & Roscoe Blvd	Signal	0.701	C	0.511	A
8. Topanga Canyon Blvd & Roscoe Blvd	Signal	0.645	B	0.745	C
9. Topanga Canyon Blvd & Sherman Way	Signal	0.780	C	0.756	C
10. Valley Circle Blvd & Victory Blvd	Signal	0.675	B	0.494	A
11. Topanga Canyon Blvd & Victory Blvd	Signal	0.749	C	0.991	E
12. Topanga Canyon Blvd & Burbank Blvd	Signal	0.639	B	0.881	D
13. Topanga Canyon Blvd & US 101 NB Off-Ramp	SSSC	>100	F	>100	F
14. Valley Circle Blvd & US 101 NB Off-Ramp / Long Valley Road	Signal	0.987	E	0.756	C
15. Valley Circle Blvd & Calabasas Rd / Avenue San Luis	Signal	0.711	C	0.827	D
16. US 101 SB Ramps & Calabasas Road	Signal	0.565	A	0.578	A

[a] Signal = Traffic Signal; SSSC = Side-Street Stop-Control; AWSC = All-Way Stop-Control.

[b] V/C = Volume-to-Capacity Ratio, which is used to determine LOS at signalized intersections (see Table 4.11-5 for ranges of V/C corresponding to each LOS);
Delay = Average delay (seconds per vehicle), which is used to determine LOS at unsignalized intersections (SSSC and AWSC); see Appendix A of the *Traffic Study for Santa Susana Field Laboratory EIR*, which is presented in Appendix H of this PEIR, for the ranges of delay values corresponding to each LOS.

[c] WB = westbound, EB = eastbound, NB = northbound, SB = southbound

SOURCE: KOA Corporation, 2017 (see Appendix H of this PEIR).

- #11 (Topanga Canyon Boulevard & Victory Boulevard) operates at LOS E in the p.m. peak hour
- #13 (Topanga Canyon Boulevard & US 101 Northbound Off-Ramp) operates at LOS F in the both the a.m. and p.m. peak hours
- #14 (Valley Circle Boulevard & US 101 Northbound Off-Ramp / Long Valley Road) operates at LOS E in the a.m. peak hour

Existing Roadway Operations

Roadway segment counts were conducted on Thursday, December 18, 2014, and Tuesday, April 28, 2015, over a contiguous 24-hour period. Existing daily roadway volumes are shown in **Figure 4.11-4**. As shown in **Table 4.11-3**, the following four roadway segments in the study area operate at a poor LOS (LOS E or F) during one or both of the morning and evening peak hours; the remaining seven segments operate at LOS D or better during both peak traffic hours:

- #D (Valley Circle Boulevard: Box Canyon Road to Woolsey Canyon Road) operates at LOS F in the a.m. peak hour
- #G (Valley Circle Boulevard: Woolsey Canyon Road to Chatlake Drive) operates at LOS F in the a.m. peak hour and LOS E in the p.m. peak hour
- #I (Roscoe Boulevard: Shoup Avenue to Farralone Avenue) operates at LOS F in the p.m. peak hour
- #K (Valley Circle Boulevard: Burbank Boulevard to US 101) operates at LOS F in both the a.m. and p.m. peak hours

Alternative Transportation Facilities – Bicycle, Pedestrian, and Transit Network

Bicycle Facilities. A review of bicycle facilities (e.g., striped lanes and/or routes designated by signage) was conducted. There is varying use of roadways near the project site (where truck traffic generated by the site remediation process would be traveling) by bicyclists. Review of that use[2] focused on the following two-lane roadways in relative vicinity to the project site:

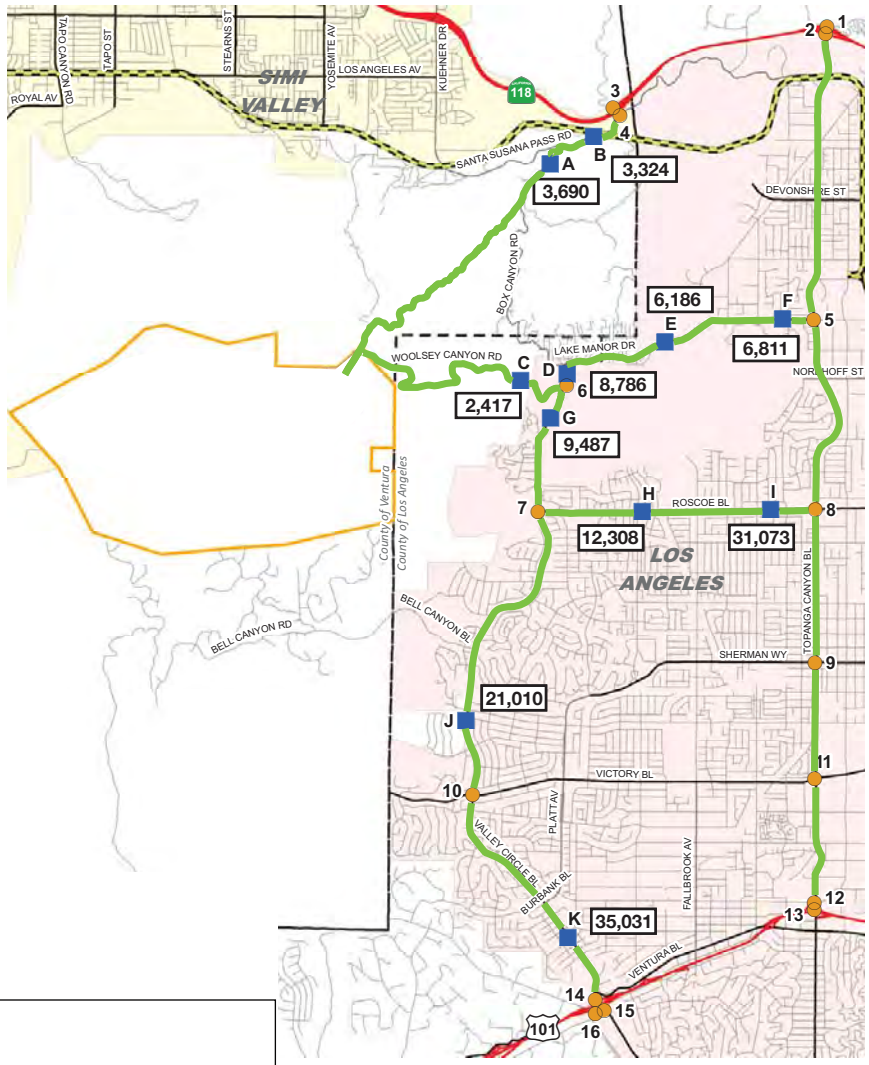
Lake Manor Drive has striped shoulders that provide some comfort level for bicyclists, and has a relatively low presence of hills and curves.

Roscoe Boulevard has signed/striped bicycle lanes. It also has the lowest number of bicycle riders among the roads counted for this analysis.

Valley Circle Boulevard (the 1.1-mile-long segment between Woolsey Canyon Road and Roscoe Boulevard) is relatively narrow and hilly with curves; there are no striped bicycle lanes. Valley Circle Boulevard south of Roscoe Boulevard widens to four lanes and has striped bike lanes.

There were 14 or fewer bicyclists over the 4-hour weekday count periods at each of the three count locations, but those volumes are generally concentrated in 1 of the 4 hours. The Saturday bicycle activity is much higher than the weekday use of the roadways (particularly on Lake Manor Drive and Valley Circle Boulevard).

[2] These counts were conducted on a weekday (Thursday, February 25, 2016) and a Saturday (Saturday, February 27, 2016). The weekday count time frames were from 6:00 a.m. to 10:00 a.m. (to capture bicycle commuters and recreational bicyclists on morning rides) and 2:00 p.m. to 6:00 p.m. (to capture early afternoon school trips made on bicycle and return commute trips). The weekend count time frame was from 7:00 a.m. to 11:00 a.m. (to capture morning recreational cyclists). It is noted that although there could be a higher number of bicycle commuters when days are longer and weather is better than it is in late February, the potential impacts described under Impact 4.11-2a (and required Mitigation Measure TRANS-1) are expected to be similar during all times of the year.



LEGEND

- SSFL Property
- Truck Route Options
- Study Intersection
- Study Roadway Segment
- xx Intersection Turn Volumes
- XXX Peak Roadway Volumes

0 1 2 Miles

N

SOURCE: KOA Corporation, 2016

Santa Susana Field Laboratory . 120894

Figure 4.11-4

Existing (2015) Daily Roadway Traffic Volumes

TABLE 4.11-3
SUMMARY OF EXISTING (2015) LEVEL OF SERVICE (LOS) OF ROADWAY SEGMENTS

	Roadway	From	To	Peak Hour	Travel Lanes [a]	Capacity	Volume	V/C Ratio	LOS
A	Box Canyon Road	Santa Susana Pass Road	Roberson Road	AM	2	1,050	509	0.485	A
				PM			452	0.430	A
B	Santa Susana Pass Road	Rocky Peak Road	Box Canyon Road	AM	2	1,050	365	0.348	A
				PM			345	0.329	A
C	Woolsey Canyon Road	Valley Circle Boulevard	Knapp Ranch Road	AM	2	1,050	214	0.204	A
				PM			254	0.242	A
D	Valley Circle Boulevard	Box Canyon Road	Woolsey Canyon Road	AM	2	1,050	1,164	1.109	F
				PM			870	0.829	D
E	Valley Circle Boulevard	Plummer Street	Schumann Road	AM	2	1,050	687	0.654	B
				PM			529	0.504	A
F	Plummer Street	Valley Circle Boulevard	Farralone Avenue	AM	2	1,050	733	0.698	B
				PM			686	0.653	B
G	Valley Circle Boulevard	Woolsey Canyon Road	Chatlake Drive	AM	2	1,050	1,247	1.188	F
				PM			962	0.916	E
H	Roscoe Boulevard	Woodlake Avenue	Shoup Avenue	AM	4	2,500	999	0.400	A
				PM			1,019	0.408	A
I	Roscoe Boulevard	Shoup Avenue	Farralone Avenue	AM	4	2,500	2,126	0.850	D
				PM			2,607	1.043	F
J	Valley Circle Boulevard	Vanowen Street	Victory Boulevard	AM	4	2,500	2,179	0.872	D
				PM			1,810	0.724	C
K	Valley Circle Boulevard	Burbank Boulevard	US 101	AM	4	2,500	3,094	1.238	F
				PM			2,842	1.137	F

a Based on the most-constricted segment of the overall roadway.
SOURCE: KOA Corporation, 2017 (see Appendix H of this PEIR).

Pedestrian Facilities. A review of traffic controls and pedestrian crossing points on roadways where project trucks would travel was conducted, to determine if there are uncontrolled or unmarked crossing points that may need measures to improve pedestrian safety during the remediation period. The review focused on areas that typically generate higher-than-average pedestrian volumes (i.e., neighborhoods with parks or schools).

In general, pedestrian routes from most local neighborhoods with parks or schools have controlled locations with traffic signals at intersections, or crosswalks with warning lights at crossing points, on the analyzed roadways. The exceptions are as follows:

- Orcutt Ranch Horticultural Center Park – This park and events venue does not have a controlled or signed/striped pedestrian crossing point near its access point on Roscoe Boulevard (at the intersection of Roscoe Boulevard and Hillary Drive).
- Chatsworth Oaks Park – There are neither developed land uses nor a local neighborhood with pedestrian destinations across from the access point of this park on Valley Circle Boulevard. Pedestrian crossing activity here is very low.
- Castle Peak Park – This park has access points along the west side of Valley Circle Boulevard and at the intersection of Stonegate Drive/Valley Circle Boulevard. There are no destinations or neighborhoods accessible along the east side of Valley Circle Boulevard at this point. Pedestrian crossing activity here is very low.

The project study area is served by 13 public transit bus lines operated by the County of Los Angeles Metropolitan Transportation Authority (Metro), one bus line operated by Simi Valley Transit, one bus line operated by Santa Clarita Transit, and one LADOT Commuter Express bus line. **Table 4.11-4** provides a description of the transit bus lines that serve the study area.

4.11.2 Regulatory Setting

4.11.2.1 Federal

There are no federal regulatory transportation plans or programs that are applicable to potential impacts of the proposed project's temporary cleanup-period activities. Future development of the site is not part of the proposed project and is not evaluated in the PEIR; once cleanup-period activities end, trip generation from the project site would cease (except for some potential maintenance activities), and there would be no permanent (ongoing) transportation effects caused by the project.

4.11.2.2 State

There are no state regulatory transportation plans or programs that are applicable to potential impacts of the proposed project's temporary cleanup-period activities. As described above in Section 4.11.2.1, there would be no permanent (ongoing) transportation effects caused by the project (i.e., after cleanup is complete).

TABLE 4.11-4
STUDY AREA PUBLIC TRANSIT LINES

Service Provider	Line	From	To	Via	Headway (minutes)[a]
Metro	150	Canoga Park	Studio City	Topanga Canyon Blvd, Sherman Way, Victory Blvd	20-40
Metro	152	North Hollywood	Woodland Hills	Roscoe Boulevard	8-20
Metro	162	West Hills	Sun Valley	Sherman Way	20-45
Metro	163	West Hills	Sun Valley	Sherman Way	11-24
Metro	164	West Hills	Burbank	Valley Circle Blvd, Victory Blvd, Topanga Canyon Blvd	10-30
Metro	165	West Hills	Burbank	Valley Circle Blvd, Vanowen Street, Topanga Canyon Blvd	4-21
Metro	166	Chatsworth	Sun Valley	Topanga Canyon Blvd, Plummer Street	8-20
Metro	169	Woodland Hills	Burbank	Victory Blvd, Topanga Canyon Blvd	60
Metro	245	Chatsworth	Woodland Hills	Victory Blvd, Topanga Canyon Blvd	6-40
Metro	353	North Hollywood	Woodland Hills	Roscoe Boulevard	20-25
Metro	364	Chatsworth	Sun Valley	Topanga Canyon Blvd, Plummer Street	14-20
Metro	645	West Hills	Woodland Hills	Sherman Way, Valley Circle Blvd, Topanga Canyon Blvd	20-60
Metro	750	Studio City	Woodland Hills	Topanga Canyon Blvd	10-20
Simi Valley Transit	C	Downtown Los Angeles	Sun Valley	San Fernando Road	15-20
Santa Clarita Transit	791	Downtown Los Angeles	Sun Valley	San Fernando Road	15-20
LADOT Commuter Express	422	Downtown Los Angeles	Thousand Oaks	Topanga Canyon Blvd	10-40

[a] Headway = Frequency of Service (i.e., time between buses on route).
SOURCE: KOA Corporation, 2017 (see Appendix H of this PEIR).

4.11.2.3 Regional

There are no regional regulatory transportation plans or programs that are applicable to potential impacts of the proposed project's temporary cleanup-period activities. As described in Section 4.11.2.1, there would be no permanent (ongoing) transportation effects caused by the project (i.e., after cleanup is complete).

4.11.2.4 Local

Traffic Study Policies and Procedures. The significance of potential project-generated traffic impacts at intersections under the jurisdiction of the cities of Los Angeles and Simi Valley, and

the County of Los Angeles, is determined based on criteria established by those jurisdictions; see Section 4.11.3, *Thresholds of Significance*, for the City's sliding-scale criteria.

4.11.3 Thresholds of Significance

For the purposes of this PEIR, DTSC has used the checklist questions in Appendix G of the CEQA Guidelines as the significance criteria, along with applicable thresholds of significance established by project area jurisdictions, to determine whether the project would have a significant environmental impact regarding Transportation and Traffic. Based on the size and scope of the project and the potential for impacts, the criteria identified below are included for evaluation in this PEIR. Please see Chapter 7.0, *Impacts Found Not to Be Significant*, of this PEIR, for a discussion of other issues associated with the evaluation of Transportation and Traffic where the characteristics of the project made it clear that effects would not be significant and further evaluation in this section was not warranted.

Would the project:

4.11-1 Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit (refer to Impact Statements 4.11-1and 4.11-1b)?

4.11-2 Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) (refer to Impact Statements 4.11-2a and 4.11-2b)?

4.11-3 Result in inadequate emergency access (refer to Impact Statements 4.11-3a and 4.11-3b)?

For purposes of this analysis (and to be consistent with County of Los Angeles, City of Los Angeles, and City of Simi Valley criteria), the thresholds of significance in **Table 4.11-5** were used to determine if the project would have a significant traffic impact at a signalized intersection:

For unsignalized intersections, the project would have a significant impact if it caused or worsened LOS E or F operations and peak-hour traffic signal warrants would be met.[3]

For roadway segments, the project would have a significant impact if project-related traffic caused LOS E or F operations to occur or worsened existing LOS E or F operations by increasing the V/C ratio by 0.02 or more.

[3] The need for a traffic signal is evaluated according to a series of eight "traffic signal warrants," as defined by the *California Manual on Uniform Traffic Control Devices* (CA MUTCD; Caltrans, 2015b). These traffic signal warrants provide the minimum conditions under which installing a traffic signal might be justified. The peak-hour warrant is intended for use at locations where the combination of traffic volumes on the major and minor streets are such that for a minimum of one hour of an average day, the minor street traffic suffers undue delay when entering or crossing the major street. The signal warrant worksheets are provided in Appendix H of this PEIR.

TABLE 4.11-5
SIGNALIZED INTERSECTION IMPACT THRESHOLD CRITERIA

Final V/C Ratio [a]	Level of Service	Project-Related Increase in V/C Ratio Considered Significant: City of Los Angeles and County of Los Angeles	Project-Related Increase in V/C Ratio Considered Significant: City of Simi Valley
0.000 – 0.600	A	Not applicable [b]	Not applicable [b]
0.601 – 0.700	B	Not applicable [b]	Not applicable [b]
0.701 – 0.800	C	Equal to or greater than 0.040	Not applicable [c]
0.801 – 0.900	D	Equal to or greater than 0.020	Not applicable [c]
0.901 – 1.000	E	Equal to or greater than 0.010	Equal to or greater than 0.020
> 1.000	F	Equal to or greater than 0.010	Equal to or greater than 0.020

[a] V/C Ratio = Volume-to-Capacity Ratio, which is used to determine LOS at signalized intersections.
[b] There would be no significant impact if LOS would be LOS B or better.
[c] The City of Simi Valley's impact standards are based on a change in V/C ratio of 0.02 or more, causing or worsening LOS E or F (i.e., there would be no significant impact if LOS would be LOS D or better).
SOURCES: city of Los Angeles, county of Los Angeles, and city of Simi Valley.

4.11.4 Methodology

Any potential traffic impacts from the proposed remediation activities (referred to in this document as the project) would be related to employee vehicle travel and truck hauling trips. The analysis is based on the impacts of the project relative to the conditions at the study intersections and roadway segments during the peak period of remediation activities. An analysis of post-project activities (operations) was not undertaken, because once remediation activities end the trip generation from the project site would be reduced to negligible levels with some potential maintenance activities remaining at the site. The traffic study guidelines for the affected jurisdictions are focused on development projects (i.e., where the impact potential is ongoing for the life of a proposed development or facility), but those impact standards were applied for this analysis despite the project's temporary cleanup-period impacts.

Major project remediation activities are anticipated to begin in the year 2018 and continue for 15 years. The 15-year time frame (Year 2032) was selected for the future analysis year because it represents the furthest point in the future within the remediation timeline, which accounts for a greater quantity of future traffic growth to define a conservative analysis baseline. A year 2018 plus project scenario is also presented (under Impact 4.11-1b, Initial Activities, below) to describe potential project impacts during the start-of-remediation year.

4.11.4.1 Intersections

Analysis of signalized study intersections was performed using the Transportation Research Board (TRB) Circular 212 Planning or Critical Movement Analysis (CMA) methodology. The CMA methodology is based on the V/C ratios for each approach movement (left turns, through movements, right turns) and the sums of critical movements for the intersection. Critical movements are the highest-volume opposing and conflicting movements, such as the eastbound

through movement and the westbound left turn. These movements cannot proceed through the intersection at the same time, so one movement affects the other. The analysis of unsignalized study intersections was performed using the TRB *Highway Capacity Manual* (HCM) methodology. The HCM methodology is based on the average delay (in seconds per vehicle) for the worst turning movement (typically the side-street stop-controlled left turns).

4.11.4.2 Roadways

Analysis of roadway segments was performed by applying per-lane capacities that were based on extrapolations of the HCM methodology, using the general capacity guidelines of approximately 500 to 600 peak-hour vehicles per lane.

4.11.5 Analysis of Project Impacts

The following text describes the potential environmental impacts related to transportation and traffic associated with implementing the overall site cleanup and initial activities, demarcated as impact "a" and "b" respectively. As presented in Section 3.7, *Initial Activities*, of this PEIR, the initial activities include eight different projects. Depending on the degree to which impacts of the initial projects would be similar to or different from each other, the impact analysis for the initial projects for some thresholds has been combined accordingly (i.e., the number of separate discussion for impact for each threshold ranges from one to eight). Each impact discussion concludes with a significance determination.

4.11.5.1 Conflicts with Transportation Plans, Ordinances, and Policies

Program Assessment

Impact 4.11-1a: Would implementation of the **overall site cleanup** conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

Overall Site Cleanup (Impact 4.11-1a)

The daily maximum number of trucks visiting the site for export and import of materials would be 96 round trips (resulting in 192 one-way trips) in total for all RPs combined. This maximum would represent all types of truck trips, including equipment deliveries, excavation spoils, building demolition debris, and delivery of backfill soil. For planning purposes, it is assumed that the maximum of 96 round trips would occur during times of peak activity (e.g., when two or more RPs have concurrent excavation, demolition, and/or backfill operations occurring), and the analysis of potential impacts presented herein is based on that level of daily truck trips. As many as 250 workers are expected to routinely travel to the site during soil removal activities and are anticipated to generate vehicle trips in addition to the trips generated by trucks.

Project Trip Generation Estimate

Estimated project trip generation (see **Table 4.11-6**) includes truck trip estimates and worker vehicle trips during the most intense period of remediation activity for the project. Truck trips were multiplied by a factor of 2.5 to estimate the number of passenger car equivalent trips, consistent with the Southern California Association of Governments *Heavy Duty Truck Model* analysis and other truck studies in the region.

TABLE 4.11-6
PROJECT PASSENGER CAR EQUIVALENT TRIP GENERATION
(250 WORKERS / 96 TRUCK ROUND TRIPS)

		AM Peak Hour			PM Peak Hour		
Trip Type	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Workers [a]	500	125	0	125	0	125	125
Haul Trucks [b]	480	30	30	60	30	30	60
TOTAL	**980**	**155**	**30**	**185**	**30**	**155**	**185**

a Daily worker trips are equal to the total trips attributed to 250 workers arriving to the site and 250 workers leaving the site, which equals 500 trips; half of the workers are assumed to arrive for work during the a.m. peak hour and to depart the site during the p.m. peak hour (the other half would arrive and depart outside the a.m. and p.m. peak hour, respectively (see Footnote 4 for a more detailed explanation of this assumption).

b Haul trucks were converted to passenger car equivalent (PCE) using a PCE factor of 2.5, consistent with the Southern California Association of Governments *Heavy Duty Truck Model* analysis and other truck studies in the region.

SOURCE: KOA Corporation, 2017 (see Appendix H of this PEIR).

The total daily trips in the table represent inbound and outbound trips by the remediation workers, and peak-hour trips for workers are based on the assumption that half of the workers would arrive for work during the a.m. peak hour and would depart the site during the p.m. peak hour.[4]

The other half of the workers would arrive to the site outside of the a.m. peak hour and would depart the site outside of the p.m. peak hour. Daily truck trips—expressed as passenger car equivalent (PCE) trips in the table—likewise represent inbound and outbound trips by the trucks. In order to provide a conservative analysis of potential impacts, truck trips are based on the assumption that they would be spread evenly over 8 hours within the 11-hour work shift. As shown in the table, the project would generate up to about 980 PCE trips per day, with about 185 PCE trips during both the a.m. and p.m. peak hours.

Project Trip Distribution

The best travel routes by project trucks between the site access points and the nearby SR 118 / Topanga Canyon Boulevard interchange to the north, and the US 101 / Valley Circle Boulevard

4 Most site activities would occur Monday through Friday, from 7:00 a.m. to 6:00 p.m., and it is reasonable to assume that remediation workers would arrive at the site prior to the 7:00 a.m. start of their work day (and prior to the start of the a.m. peak traffic hour) and would depart from the site after the 6:00 p.m. end of their work day (and after the end of the p.m. peak traffic hour). However, so as to not underestimate potential impacts, this analysis assumes that half of the workers would commute to and from the site during the peak traffic hours (i.e., arrive a little later than 7:00 a.m. and depart a little earlier than 6:00 p.m.).

and US 101 / Topanga Canyon Boulevard interchanges to the south, were derived based on the anticipated trip origins/destinations.

Trucks would travel to SR 118 (70 percent) or US 101 (30 percent)[5] via the following routes, as shown in Figure 3-7 in the Chapter 3.0, *Project Description*, of this PEIR:

- Woolsey Canyon to Valley Circle Boulevard to Roscoe Boulevard to Topanga Canyon Boulevard (SR 27) to SR 118 – 60 percent
- Woolsey Canyon to Valley Circle Boulevard to Lake Manor Drive to Valley Circle Boulevard to Plummer Avenue to Topanga Canyon Boulevard (SR 27) to SR 118[6] – 10 percent
- Woolsey Canyon to Valley Circle Boulevard to US 101 – 20 percent
- Woolsey Canyon to Valley Circle Boulevard to Roscoe Boulevard to Topanga Canyon Boulevard (SR 27) to US 101 – 10 percent

The Valley Circle Boulevard to Roscoe Boulevard route is considered the best route to/from SR 118 because it would provide less delay and more maneuverability for trucks and autos than the Valley Circle Boulevard/Lake Manor Drive to Plummer Avenue route. The Valley Circle Boulevard/Lake Manor Drive to Plummer Avenue route would be the most direct route to SR 118 (4.8 miles compared to 7.5 miles via the Roscoe Boulevard route), but these two-lane roads with all-way stop-controlled intersections would introduce more delay. However, the shorter travel distance and changing traffic conditions may dictate occasionally using this route, thus the analysis assumes some trucks would use this route, which ensures that potential impacts would not be understated.

Similarly, Valley Circle Boulevard is the most direct route to/from US 101. However, the analysis assumes some trucks would use the Valley Circle Boulevard to Roscoe Boulevard to Topanga Canyon Boulevard route, which ensures that potential impacts would not be understated.

Worker vehicle trip distribution patterns were based on population centers where workers are expected to reside, the local roadway network, and the locations of the freeway interchanges including the SR 118 / Rocky Peak Road interchange and regional east-west arterials. A similar number of workers (42 to 43 percent) are expected to use US 101 and SR 118, with about 15 percent using east-west arterials to/from areas east of Topanga Canyon Boulevard.

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5 Use of SR 118 provides the best connections to the I-5 corridor to reach central and northern areas of California, and the best connection to I-210 at its eastern terminus, where connections can be made to multiple area north-south freeways including I-15, providing access to Nevada, Idaho, and other areas. The US 101 corridor provides access to the SR 134/I-210 corridor for points to the east, and also to Los Angeles Basin with multiple freeway connections.

6 Valley Circle Boulevard and Lake Manor Drive comprise a continuous road, with "Lake Manor Drive" being the name of the road between the intersections of Valley Circle Boulevard / Box Canyon Road and Valley Circle Boulevard / Hazel Way.

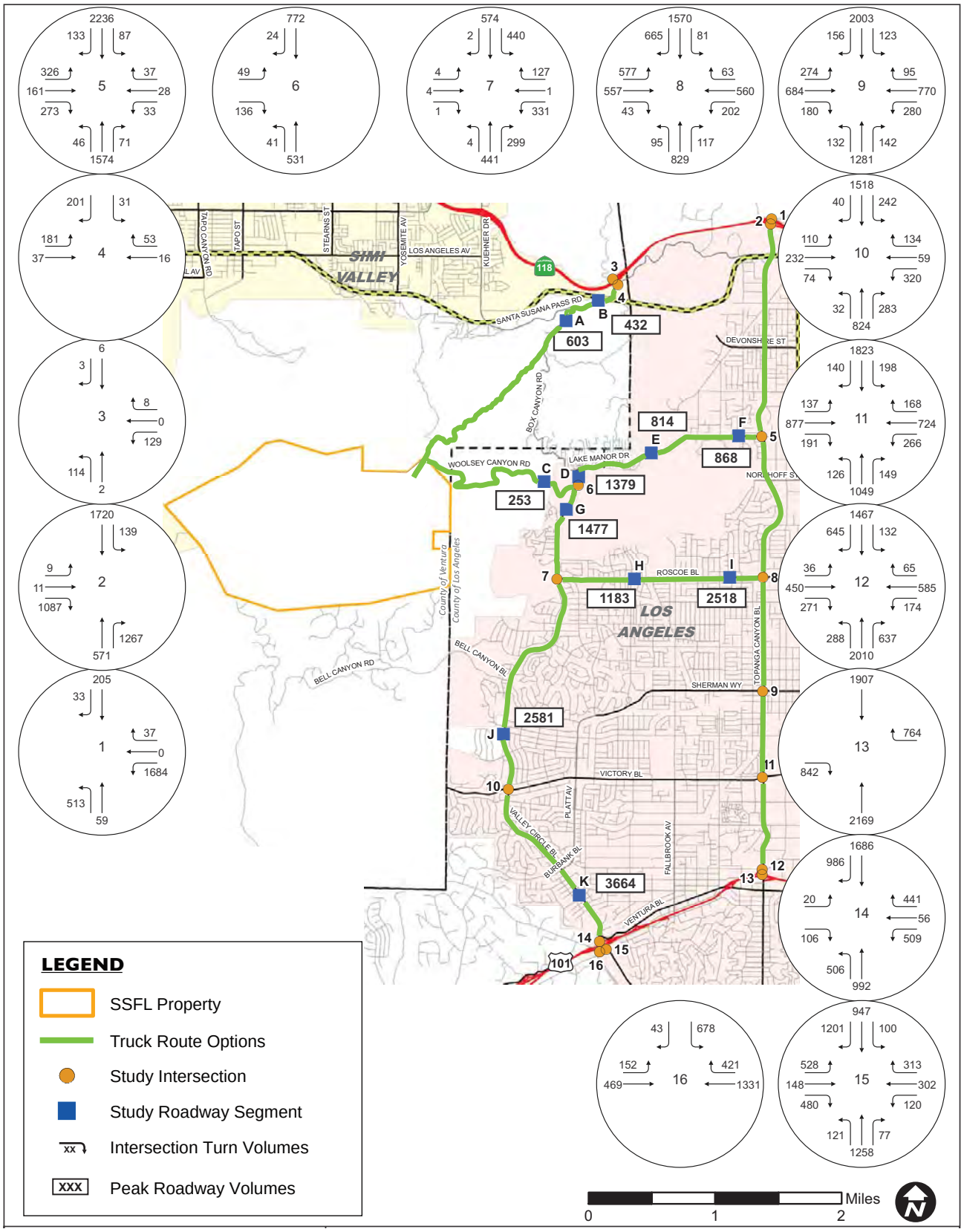
Future Year 2032 Without Project Conditions

This section provides the analysis of No-Project conditions with ambient growth. As stated previously, major project remediation activities are anticipated to continue for up to 15 years. The 15-year time frame (Year 2032) was selected for the future analysis year, as it represents the furthest point in the future within the remediation timeline that would provide the greatest amount of background traffic growth based on time to define a conservative analysis baseline.

In order to forecast Year 2032 baseline traffic volumes, existing (2015) peak-hour volumes were increased by an ambient growth rate of 1 percent per year (a 17-year compounded factor of 1.184). This growth rate is conservative (i.e., potentially overstates future traffic volumes) because the traffic growth projections for the West San Fernando Valley area in the current 2010 County of Los Angeles Congestion Management Program is 0.41 percent per year.

Intersection Operations. Figure 4.11-5 and **Figure 4.11-6** illustrate the 2032 without project a.m. and p.m. peak-hour traffic volumes at the study intersections. As shown in **Table 4.11-7**, the following 10 study intersections are projected to operate at a poor LOS (LOS E or F) during one or both of the morning and evening peak hours under the 2032 without project conditions scenario; the remaining six intersections would operate at LOS D or better during both peak traffic hours:

- #1 (Topanga Canyon Boulevard & SR 118 Westbound Ramps): LOS E in the a.m. peak hour and LOS F in the p.m. peak hour (worse than under existing conditions)
- #2 (Topanga Canyon Boulevard & SR 118 Eastbound Ramps): LOS F in the both the a.m. and p.m. peak hours (same as under existing conditions)
- #6 (Valley Circle Boulevard & Woolsey Canyon Road): LOS F in both the a.m. and peak hours (worse than under existing conditions)
- #8 (Topanga Canyon Boulevard & Roscoe Boulevard): LOS E in the p.m. peak hour (worse than under existing conditions)
- #9 (Topanga Canyon Boulevard & Sherman Way): LOS E in both the a.m. and p.m. peak hours (worse than under existing conditions)
- #11 (Topanga Canyon Boulevard & Victory Boulevard): LOS E in the a.m. peak hour and LOS F in the p.m. peak hour (worse than under existing conditions)
- #12 (Topanga Canyon Boulevard & Burbank Boulevard): LOS F in the p.m. peak hour (worse than under existing conditions)
- #13 (Topanga Canyon Boulevard & US 101 Northbound Off-Ramp): LOS F in the both the a.m. and p.m. peak hours (same as under existing conditions)
- #14 (Valley Circle Boulevard & US 101 Northbound Off-Ramp / Long Valley Road): LOS F in the a.m. peak hour and LOS E in the p.m. peak hour (worse than under existing conditions)
- #15 (Valley Circle Boulevard & Calabasas Road / Avenue San Luis): LOS E in the p.m. peak hour (worse than under existing conditions)



SOURCE: KOA Corporation, 2017

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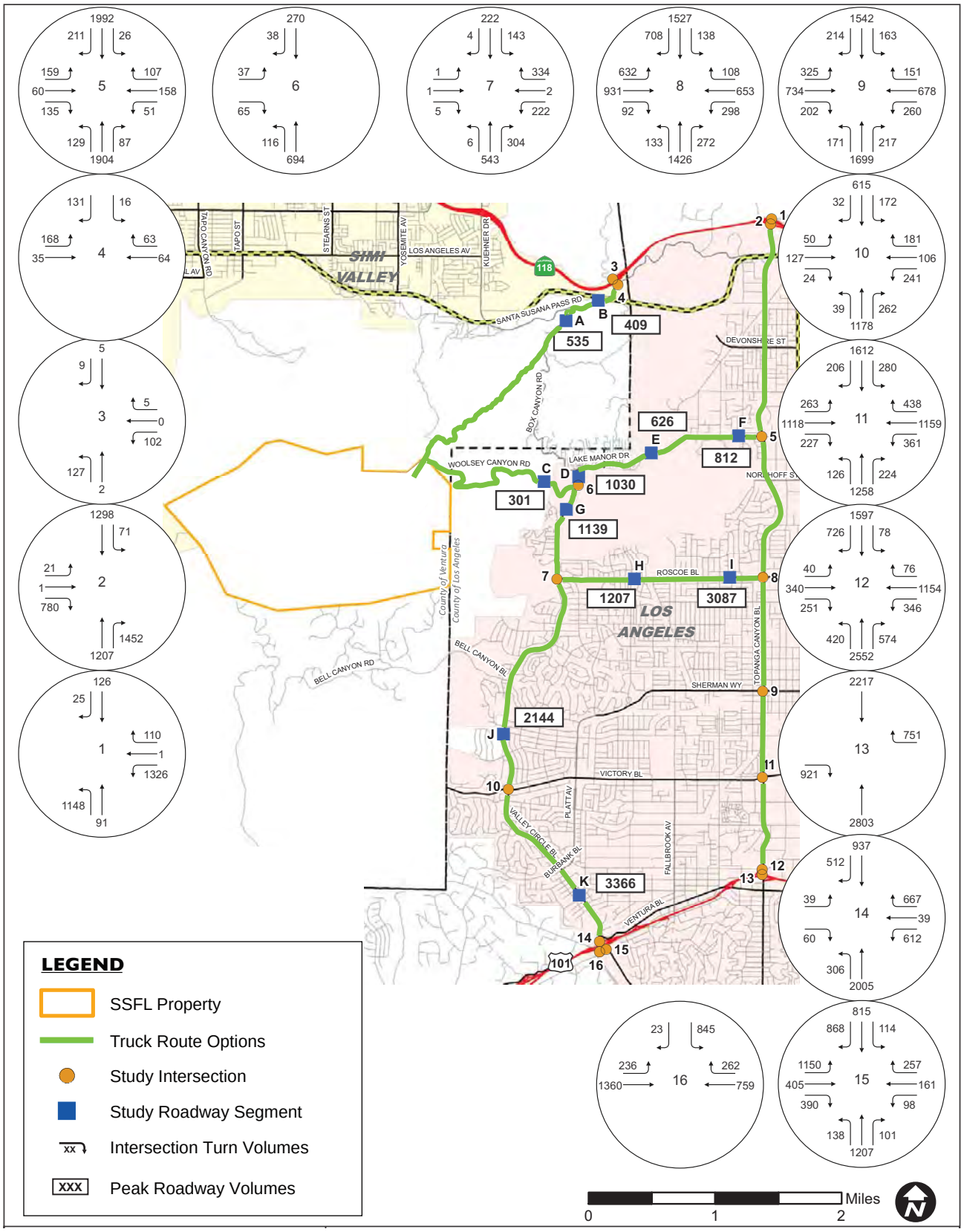
Figure 4.11-5

Future (2032) No Project AM Peak-Hour Intersection Traffic Volumes



SOURCE: KOA Corporation, 2017

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Figure 4.11-6

Future (2032) No Project PM Peak-Hour Intersection Traffic Volumes

TABLE 4.11-7
SUMMARY OF INTERSECTION LEVEL OF SERVICE (LOS)
(2032 WITHOUT PROJECT CONDITIONS)

Intersection	Traffic Control [a]	AM Peak Hour V/C or Delay [b]	AM Peak Hour LOS	PM Peak Hour V/C or Delay [b]	PM Peak Hour LOS
1. Topanga Canyon Blvd & SR 118 WB Ramps	Signal	0.932	E	1.008	F
2. Topanga Canyon Blvd & SR 118 EB Ramps	Signal	1.306	F	1.270	F
3. Rocky Peak Road & SR 118 WB Ramps	SSSC	11.0	B	11.1	B
4. Rocky Peak Road & Santa Susana Pass Road	SSSC	10.3	B	9.9	A
5. Topanga Canyon Blvd & Plummer Street	Signal	0.848	D	0.766	C
6. Valley Circle Blvd & Woolsey Canyon Road	AWSC	86.2	F	67.4	F
7. Valley Circle Blvd & Roscoe Blvd	Signal	0.849	D	0.625	B
8. Topanga Canyon Blvd & Roscoe Blvd	Signal	0.784	C	0.903	E
9. Topanga Canyon Blvd & Sherman Way	Signal	0.944	E	0.915	E
10. Valley Circle Blvd & Victory Blvd	Signal	0.819	D	0.605	B
11. Topanga Canyon Blvd & Victory Blvd	Signal	0.905	E	1.194	F
12. Topanga Canyon Blvd & Burbank Blvd	Signal	0.776	C	1.062	F
13. Topanga Canyon Blvd & US 101 NB Off-Ramp	SSSC	>100	F	>100	F
14. Valley Circle Blvd & US 101 NB Off-Ramp / Long Valley Road	Signal	1.189	F	0.915	E
15. Valley Circle Blvd & Calabasas Rd / Avenue San Luis	Signal	0.861	D	1.000	E
16. US 101 SB Ramps & Calabasas Road	Signal	0.688	B	0.704	C

[a] Signal = Traffic Signal; SSSC = Side-Street Stop-Control; AWSC = All-Way Stop-Control.
[b] V/C = Volume-to-Capacity Ratio, which is used to determine LOS at signalized intersections; Delay = Average delay (seconds per vehicle), which is used to determine LOS at unsignalized intersections.
SOURCE: KOA Corporation, 2017 (see Appendix H of this PEIR).

Roadway Operations. As shown in **Table 4.11-8**, the following five roadway segments in the study area are projected to operate at a poor LOS (LOS E or F) during one or both of the morning and evening peak hours under the 2032 without project conditions scenario; the remaining six segments would operate at LOS D or better during both peak traffic hours:

- #D (Valley Circle Boulevard: Box Canyon Road to Woolsey Canyon Road): LOS F in the a.m. peak hour and LOS E in the p.m. peak hour (same as under existing a.m. peak hour, but worse than under existing p.m. peak hour)
- #G (Valley Circle Boulevard: Woolsey Canyon Road to Chatlake Drive): LOS F in both the a.m. and p.m. peak hours (same as under existing a.m. peak hour, but worse than under existing p.m. peak hour)
- #I (Roscoe Boulevard: Shoup Avenue to Farralone Avenue): LOS F in both the a.m. and p.m. peak hours (worse than under existing a.m. peak hour, but the same as under existing p.m. peak hour)

TABLE 4.11-8
SUMMARY OF PEAK-HOUR ROADWAY SEGMENT LEVEL OF SERVICE (LOS)
(2032 WITHOUT PROJECT CONDITIONS)

	Roadway	From	To	Peak Hour	Travel Lanes [a]	Capacity	Volume	V/C Ratio	LOS
A	Box Canyon Road	Santa Susana Pass Road	Roberson Road	AM	2	1,050	603	0.574	A
				PM			535	0.510	A
B	Santa Susana Pass Road	Rocky Peak Road	Box Canyon Road	AM	2	1,050	432	0.411	A
				PM			409	0.390	A
C	Woolsey Canyon Road	Valley Circle Boulevard	Knapp Ranch Road	AM	2	1,050	253	0.241	A
				PM			301	0.287	A
D	Valley Circle Boulevard	Box Canyon Road	Woolsey Canyon Road	AM	2	1,050	1,379	1.313	F
				PM			1,030	0.981	E
E	Valley Circle Boulevard	Plummer Street	Schumann Road	AM	2	1,050	814	0.775	C
				PM			626	0.596	A
F	Plummer Street	Valley Circle Boulevard	Farralone Avenue	AM	2	1,050	868	0.827	D
				PM			812	0.773	C
G	Valley Circle Boulevard	Woolsey Canyon Road	Chatlake Drive	AM	2	1,050	1,477	1.407	F
				PM			1,139	1.085	F
H	Roscoe Boulevard	Woodlake Avenue	Shoup Avenue	AM	4	2,500	1,183	0.473	A
				PM			1,207	0.483	A
I	Roscoe Boulevard	Shoup Avenue	Farralone Avenue	AM	4	2,500	2,518	1.007	F
				PM			3,087	1.235	F
J	Valley Circle Boulevard	Vanowen Street	Victory Boulevard	AM	4	2,500	2,581	1.032	F
				PM			2,144	0.858	D
K	Valley Circle Boulevard	Burbank Boulevard	US 101	AM	4	2,500	3,664	1.466	F
				PM			3,366	1.346	F

[a] Based on the most-constricted segment of the overall roadway.
SOURCE: KOA Corporation, 2017 (see Appendix H of this PEIR).

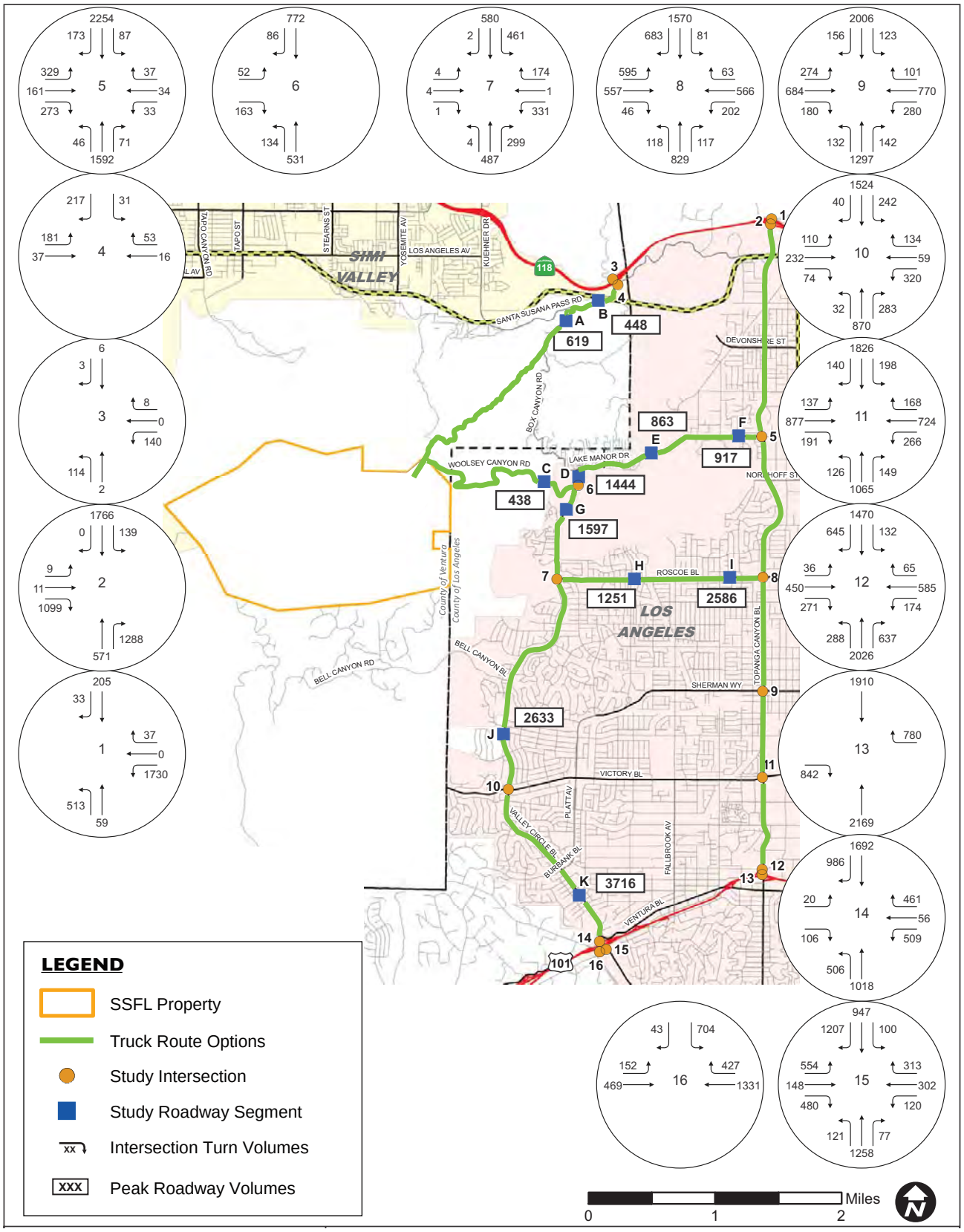
- #J (Valley Circle Boulevard: Vanowen Street to Victory Boulevard): LOS F in the a.m. peak hour (worse than under existing conditions)
- #K (Valley Circle Boulevard: Burbank Boulevard to US 101) operates at LOS F in both the a.m. and p.m. peak hours (same as under existing conditions)

Future Year 2032 With Project Conditions

This section provides the analysis of conditions (impacts) with project remediation activities in the study area (the addition of project-generated trips on top of the 2032 No-Project traffic volumes).

Intersection Operations. Figure 4.11-7 and **Figure 4.11-8** illustrate the 2032 with project a.m. and p.m. peak-hour traffic volumes at study intersections. As shown in **Table 4.11-9**, 10 study intersections (the same as identified above for the No-Project conditions) would continue to operate at a poor LOS (LOS E or F) during one or both of the morning and evening peak hours under the 2032 with project conditions scenario; the remaining six intersections would continue to operate at LOS D or better during both peak traffic hours (though the increase of V/C ratio at one of those six intersections (#7 – Valley Circle Boulevard & Roscoe Boulevard) would exceed the applicable threshold of significance for intersections operating at LOS D):

- #1 (Topanga Canyon Boulevard & SR 118 Westbound Ramps): LOS E in the a.m. peak hour (same as under the 2032 No-Project conditions scenario, with an increase of 0.017 in the V/C ratio), and LOS F in the p.m. peak hour (same as under the 2032 No-Project conditions scenario, with an increase of 0.013 in the V/C ratio). The increases in V/C ratio would exceed the County of Los Angeles and City of Los Angeles threshold of significance for intersections operating at LOS E or F, resulting in a significant impact.
- #2 (Topanga Canyon Boulevard & SR 118 Eastbound Ramps): LOS F in both the a.m. and p.m. peak hours (same as under the 2032 No-Project conditions scenario, with increases of 0.019 and 0.032 in the V/C ratio, respectively). The increases in V/C ratio would exceed the County of Los Angeles and City of Los Angeles threshold of significance for intersections operating at LOS F, resulting in a significant impact.
- #6 (Valley Circle Boulevard & Woolsey Canyon Road): LOS F in the both the a.m. and p.m. peak hours (same as 2032 No-Project conditions), and the peak-hour signal warrant would be met at this unsignalized intersection. The poor LOS and combination of traffic volumes on the two roads exceeding the peak-hour signal warrant threshold would result in a significant impact.
- #7 (Valley Circle Boulevard & Roscoe Boulevard): LOS D in the a.m. peak hour (same as under the 2032 No-Project conditions scenario, with an increase of 0.037 in the V/C ratio). The increase in V/C ratio would exceed the County of Los Angeles and City of Los Angeles threshold of significance for intersections operating at LOS D, resulting in a significant impact.



SOURCE: KOA Corporation, 2017

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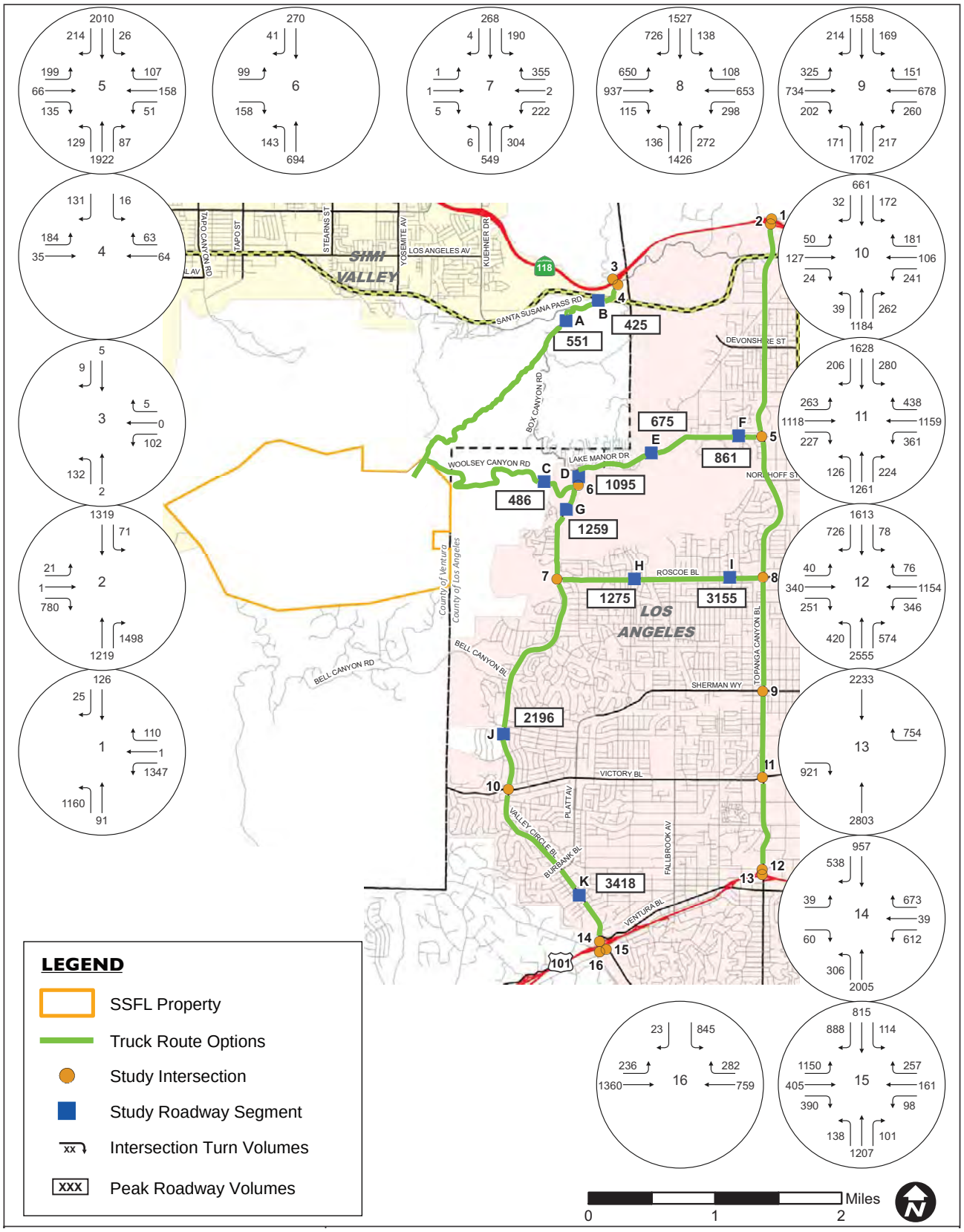
Figure 4.11-7

Future (2032) With Project AM Peak-Hour Intersection Traffic Volumes



SOURCE: KOA Corporation, 2017

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Figure 4.11-8

Future (2032) With Project PM Peak-Hour Intersection Traffic Volumes

TABLE 4.11-9
SUMMARY OF INTERSECTION LEVEL OF SERVICE (LOS)
(COMPARISON OF 2032 NO-PROJECT AND WITH-PROJECT CONDITIONS)

		2032 No Project				2032 With Project			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
Intersection	Traffic Control [a]	V/C or Delay [b]	LOS	V/C or Delay [b]	LOS	V/C or Delay [b]	LOS	V/C or Delay [b]	LOS
1. Topanga Canyon Blvd & SR 118 WB Ramps	Signal	0.932	E	1.008	F	**0.949 (+0.017)**	**E**	**1.021 (+0.013)**	**F**
2. Topanga Canyon Blvd & SR 118 EB Ramps	Signal	1.306	F	1.270	F	**1.325 (+0.019)**	**F**	**1.302 (+0.032)**	**F**
3. Rocky Peak Road & SR 118 WB Ramps	SSSC	11.0	B	11.1	B	11.1	B	11.2	B
4. Rocky Peak Road & Santa Susana Pass Road	SSSC	10.3	B	9.9	A	10.4	B	10.0	A
5. Topanga Canyon Blvd & Plummer Street	Signal	0.848	D	0.766	C	0.862	D	0.776	C
6. Valley Circle Blvd & Woolsey Canyon Road	AWSC	86.2	F	67.4	F	**>100**	**F**	**>100**	**F**
7. Valley Circle Blvd & Roscoe Blvd	Signal	0.849	D	0.625	B	**0.886 (+0.037)**	**D**	0.659	B
8. Topanga Canyon Blvd & Roscoe Blvd	Signal	0.784	C	0.903	E	**0.810 (+0.026)**	**D**	0.910	E
9. Topanga Canyon Blvd & Sherman Way	Signal	0.944	E	0.915	E	0.947	E	0.920	E
10. Valley Circle Blvd & Victory Blvd	Signal	0.819	D	0.605	B	0.821	D	0.606	B
11. Topanga Canyon Blvd & Victory Blvd	Signal	0.905	E	1.194	F	0.911	E	1.195	F
12. Topanga Canyon Blvd & Burbank Blvd	Signal	0.776	C	1.062	F	0.776	C	1.062	F
13. Topanga Canyon Blvd & US 101 NB Off-Ramp	SSSC	>100	F	>100	F	**>100**	**F**	**>100**	**F**
14. Valley Circle Blvd & US 101 NB Off-Ramp / Long Valley Rd	Signal	1.189	F	0.915	E	1.189	F	0.917	E
15. Valley Circle Blvd & Calabasas Road / Avenue San Luis	Signal	0.861	D	1.000	E	0.872	D	1.000	E
16. US 101 SB Ramps & Calabasas Road	Signal	0.688	B	0.704	C	0.698	B	0.704	C

[a] Signal = Traffic Signal; SSSC = Side-Street Stop-Control; AWSC = All-Way Stop-Control.

[b] V/C = Volume-to-Capacity Ratio (used to determine LOS at signalized intersections); Delay = Average delay (seconds per vehicle), which is used to determine LOS at unsignalized intersections.
Shaded Bold = Significant Impact, based on thresholds of significance described previously in Section 4.11.3.

SOURCE: KOA Corporation, 2017 (see Appendix H of this PEIR).

- #8 (Topanga Canyon Boulevard & Roscoe Boulevard): LOS E in the p.m. peak hour (same as 2032 No-Project conditions, with an increase of 0.007 in the V/C ratio). The increase in V/C ratio would not exceed the County of Los Angeles and City of Los Angeles threshold of significance for intersections operating at LOS E, resulting in a less-than-significant impact. However, the intersection would operate at LOS D in the a.m. peak hour under the 2032 with project conditions scenario, with an increase in the V/C ratio of 0.026, which would exceed the threshold of significance established by the City of Los Angeles for intersections operating at LOS D, resulting in a significant impact.
- #9 (Topanga Canyon Boulevard & Sherman Way): LOS E in both the a.m. and the p.m. peak hours (same as under the 2032 No-Project conditions scenario, with increases of 0.003 and 0.005 in the V/C ratio, respectively). The increases in V/C ratios would not exceed the County of Los Angeles and City of Los Angeles threshold of significance for intersections operating at LOS E, resulting in a less-than-significant impact.
- #11 (Topanga Canyon Boulevard & Victory Boulevard): LOS E in the a.m. peak hour (same as under the 2032 No-Project conditions scenario, with an increase of 0.006 in the V/C ratio), and LOS F in the p.m. peak hour (same as under the 2032 No-Project conditions scenario, with an increase of 0.001 in the V/C ratio). The increase in V/C ratio would not exceed the County of Los Angeles and City of Los Angeles threshold of significance for intersections operating at LOS E or F, resulting in a less-than-significant impact.
- #12 (Topanga Canyon Boulevard & Burbank Boulevard): LOS F in the p.m. peak hour (same as under the 2032 No-Project conditions scenario, with no change to the V/C ratio); a less-than-significant impact.
- #13 (Topanga Canyon Boulevard & US 101 Northbound Off-Ramp): LOS F in the both the a.m. and p.m. peak hours (same as under the 2032 No-Project conditions scenario), and the peak-hour signal warrant would be met at this unsignalized intersection. The poor LOS and combination of traffic volumes on the two roads exceeding the peak-hour signal warrant thresholds result in a significant impact.
- #14 (Valley Circle Boulevard & US 101 Northbound Off-Ramp / Long Valley Road): LOS F in the a.m. peak hour (same as under the 2032 No-Project conditions scenario, with no change to the V/C ratio), and LOS E in the p.m. peak hour (same as under the 2032 No-Project conditions scenario, with an increase of 0.002 in the V/C ratio). The increase in V/C ratio would not exceed the County of Los Angeles and City of Los Angeles threshold of significance for intersections operating at LOS E, resulting in a less-than-significant impact.
- #15 (Valley Circle Boulevard & Calabasas Road / Avenue San Luis): LOS E in the p.m. peak hour (same as under the 2032 No-Project conditions scenario, with no change to the V/C ratio). The increase in V/C ratio would exceed the County of Los Angeles and City of Los Angeles threshold of significance for intersections operating at LOS E, resulting in a significant impact.

Roadway Operations. As shown in **Table 4.11-10**, five roadway segments (the same as identified previously for the No-Project conditions) would continue to operate at a poor LOS (LOS E or F) during one or both of the morning and evening peak hours under the 2032 with project conditions scenario, and project trips would increase the V/C ratio by 0.02 or more; the remaining six segments would continue to operate at LOS D or better during both peak traffic hours:

- #D (Valley Circle Boulevard: Box Canyon Road to Woolsey Canyon Road): LOS F in both the a.m. and p.m. peak hours, with an increase in V/C ratio of 0.062 for both the a.m. and p.m. peak hours. The increases in V/C ratios would exceed the threshold of significance established for this analysis for road segments operating at LOS F, resulting in a significant impact.
- #G (Valley Circle Boulevard: Woolsey Canyon Road to Chatlake Drive): LOS F in both the a.m. and p.m. peak hours, with an increase in V/C ratio of 0.115 and 0.114 for the a.m. and p.m. peak hours, respectively. The increases in V/C ratios would exceed the threshold of significance established for this analysis for road segments operating at LOS F, resulting in a significant impact.
- #I (Roscoe Boulevard: Shoup Avenue to Farralone Avenue): LOS F in both the a.m. and p.m. peak hours, with an increase in V/C ratio of 0.027 for both the a.m. and p.m. peak hours. The increases in V/C ratio would exceed the threshold of significance established for this analysis for road segments operating at LOS F, resulting in a significant impact.
- #J (Valley Circle Boulevard: Vanowen Street to Victory Boulevard): LOS F in the a.m. peak hour, with an increase in V/C ratio of 0.021. The increase in V/C ratio would exceed the threshold of significance established for this analysis for road segments operating at LOS F, resulting in a significant impact.
- #K (Valley Circle Boulevard: Burbank Boulevard to US 101): LOS F in both the a.m. and p.m. peak hours, with an increase in V/C ratio of 0.20 and 0.021 for the a.m. and p.m. peak hour, respectively. The increases in V/C ratio would exceed the threshold of significance established for this analysis for road segments operating at LOS F, resulting in a significant impact.

The significant impacts described above would be reduced by implementation of Mitigation Measure TRANS-1, which requires implementation of a DTSC-approved Site-Wide Traffic Management Plan that would identify common traffic-control requirements for onsite deliveries and offsite hauling to facilitate safe and efficient traffic flow on public roadways. The plan would provide specific traffic-control measures, signs, and delineators to be implemented by the construction contractor(s) through the duration of cleanup activities, and would require that truck activity associated with the remediation activities under the proposed project be limited to off-peak traffic hours (i.e., hours between the end of the a.m. peak traffic hour and the start of the p.m. peak hour). Avoidance of truck trips during peak traffic hours on haul routes would reduce impacts, but impacts of vehicle trips by project workers during peak traffic hours would exceed the thresholds of significance established for this analysis for intersections and road segments, and the impacts after implementation of Mitigation Measure TRANS-1 would be considered significant and unavoidable.

TABLE 4.11-10
SUMMARY OF PEAK-HOUR ROADWAY SEGMENT LEVEL OF SERVICE (LOS) – (COMPARISON OF 2032 NO-PROJECT AND WITH-PROJECT CONDITIONS)

	Roadway	From	To	Peak Hour	Travel Lanes [a]	Capacity	2032 No Project Volume	2032 No Project V/C	2032 No Project LOS	2032 With Project Volume	2032 With Project V/C	2032 With Project LOS
A	Box Canyon Road	Santa Susana Pass Rd	Roberson Road	AM	2	1,050	603	0.574	A	619	0.590	A
				PM			535	0.510	A	551	0.525	A
B	Santa Susana Pass Rd	Rocky Peak Road	Box Canyon Road	AM	2	1,050	432	0.411	A	448	0.427	A
				PM			409	0.390	A	425	0.405	A
C	Woolsey Canyon Rd	Valley Circle Blvd	Knapp Ranch Road	AM	2	1,050	253	0.241	A	438	0.417	A
				PM			301	0.287	A	486	0.463	A
D	Valley Circle Blvd	Box Canyon Road	Woolsey Canyon Rd	AM	2	1,050	1,379	1.313	F	1,444	**1.375 (+0.062)**	**F**
				PM			1,030	0.981	E	1,095	**1.043 (+0.062)**	**F**
E	Valley Circle Blvd	Plummer Street	Schumann Road	AM	2	1,050	814	0.775	C	863	0.822	D
				PM			626	0.596	A	675	0.643	B
F	Plummer Street	Valley Circle Blvd	Farralone Avenue	AM	2	1,050	868	0.827	D	917	0.873	D
				PM			812	0.773	C	861	0.820	D
G	Valley Circle Blvd	Woolsey Canyon Road	Chatlake Drive	AM	2	1,050	1,477	1.407	F	1,597	**1.521 (+0.115)**	**F**
				PM			1,139	1.085	F	1,259	**1.199 (+0.114)**	**F**
H	Roscoe Boulevard	Woodlake Avenue	Shoup Avenue	AM	4	2,500	1,183	0.473	A	1,251	0.500	A
				PM			1,207	0.483	A	1,275	0.510	A
I	Roscoe Boulevard	Shoup Avenue	Farralone Avenue	AM	4	2,500	2,518	1.007	F	2,586	**1.034 (+0.027)**	**F**
				PM			3,087	1.235	F	3,155	**1.262 (+0.027)**	**F**
J	Valley Circle Blvd	Vanowen Street	Victory Blvd	AM	4	2,500	2,581	1.032	F	2,633	**1.053 (+0.021)**	**F**
				PM			2,144	0.858	D	2,196	0.878	D
K	Valley Circle Blvd	Burbank Blvd	US 101	AM	4	2,500	3,664	1.466	F	3,716	**1.486 (+0.020)**	**F**
				PM			3,366	1.346	F	3,418	**1.367 (+0.021)**	**F**

[a] Based on the most-constricted segment of the overall roadway. **Shaded Bold** = Significant Impact, based on thresholds of significance described previously in Section 4.11.3,
SOURCE: KOA Corporation, 2017 (see Appendix H of this PEIR).

Conclusion: Implementation of overall site cleanup would significantly contribute to the future degradation of traffic LOS at area intersections and on area roadways. Mitigation Measure TRANS-1 would reduce direct or indirect impacts, but would not prevent such impacts from occurring, during project cleanup activities. Once completed, proposed cleanup activities would cease, and the project would not affect the area's traffic LOS because project-generated vehicle trips would cease when activities associated with site cleanup end. Impacts would be considered significant and unavoidable.

Impact 4.11-1a Determination: *Traffic associated with the* ***overall site cleanup*** *would substantially degrade traffic LOS at area intersections and on area roadways. Once cleanup activities are completed, the project would not affect the area's traffic LOS because project-generated vehicle trips would cease when activities associated with site cleanup end. Mitigation Measure TRANS-1 would reduce direct or indirect impacts, but would not prevent such impacts from occurring, during project cleanup activities. Therefore, impacts would be considered* ***significant and unavoidable.***

Initial Project Assessment

Impact 4.11-1b: Would implementation of the **initial activities** conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

Initial Activities (Impact 4.11-1b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The initial activities would involve soil excavation and disposal, building demolition, and maintenance activities in all four administrative areas and the Northern Undeveloped Area. These initial activities would not increase the earlier-described maximum number of trucks trips (96 round trips) or worker trips (250 round trips) accessing the site each day (and, in fact, are estimated to have approximately 90 worker round trips); therefore, the initial activities would not

result in significant impacts that have not been identified earlier in this section. To the degree the number of daily trucks and number of workers are lower than these maximum numbers, impacts would be less than described. In addition, the initial activities would be completed at an earlier date than 15 years from now as assumed for the overall cleanup project. Therefore, the future baseline conditions for the initial activities would not involve as much traffic growth. Thus, the potential for the initial activities to result in a significant impact on intersections and roadway segments would be less than anticipated for the overall cleanup project because the No-Project conditions for the initial activities would be less than those anticipated for the overall site cleanup. However, the following analysis of year 2018 with project conditions is presented in order to provide a description of potential traffic impacts if the initial activities were to generate daily vehicle trips at the level of 96 truck round trips and 250 worker round trips during the start-of-remediation year.

Year 2018 (Start of Remediation) Without Project Conditions

This section provides the analysis of No-Project conditions at the start of remediation (Year 2018) with ambient growth. In order to forecast Year 2018 baseline traffic volumes, the same annual ambient growth rate of 1 percent per year used for 2018 conditions was applied to existing (2015) peak-hour volumes (a 3-year compounded factor of 1.030). As stated above, this growth rate potentially overstates future traffic volumes because it is higher than the 0.41 percent annual growth projection in the current 2010 County of Los Angeles Congestion Management Program.

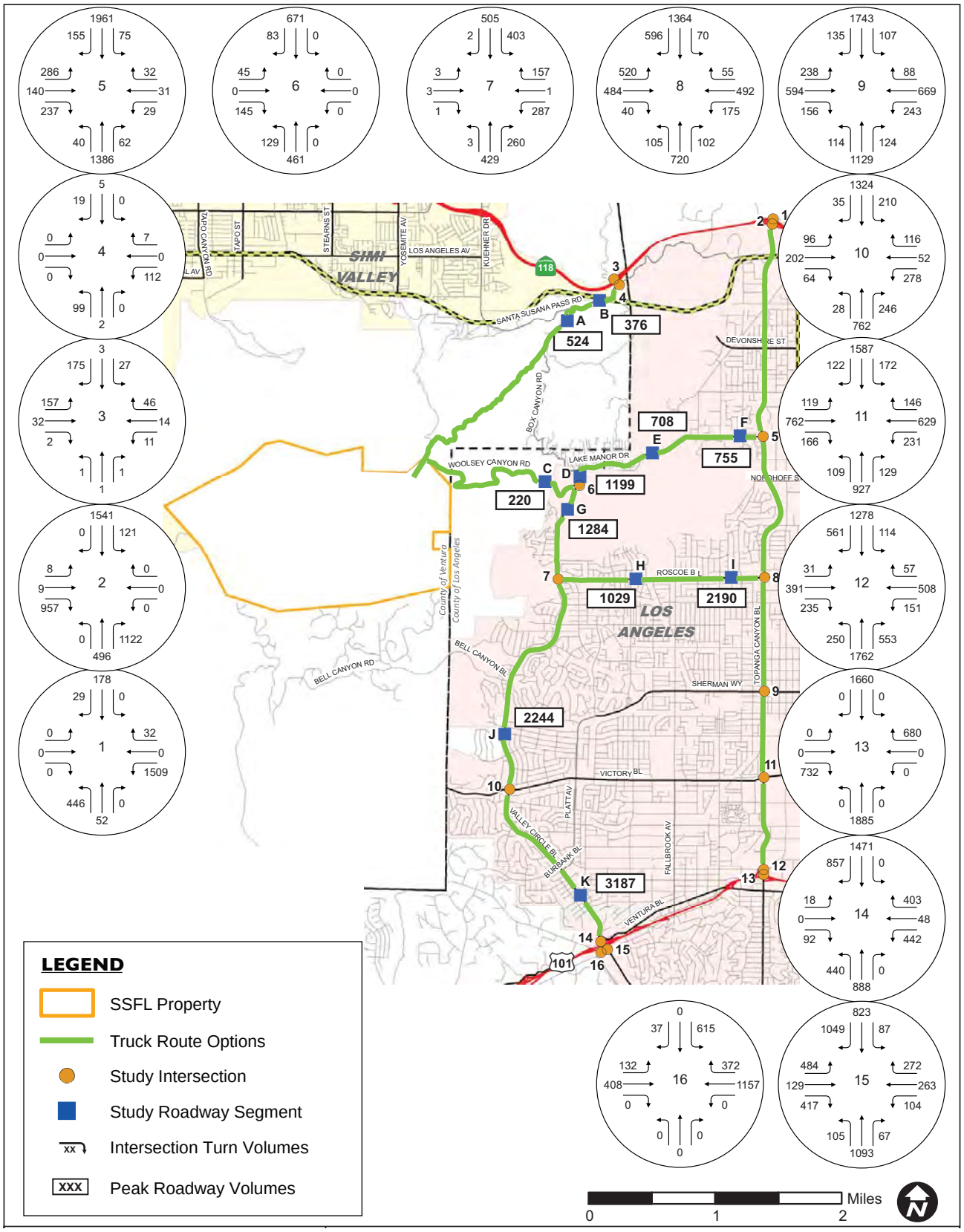
Intersection Operations. Figure 4.11-9 and **Figure 4.11-10** illustrate the 2018 without project a.m. and p.m. peak-hour traffic volumes at the study intersections. As shown in **Table 4.11-11**, the five intersections that currently operate at a poor LOS (LOS E or F) during one or both of the morning and evening peak hours would continue to operate poorly in 2018 without the proposed project, but a sixth intersection (listed below) also would operate at a poor LOS. The remaining ten intersections would continue to operate at LOS D or better during both peak traffic hours.

- #12 (Topanga Canyon Boulevard & Burbank Boulevard): LOS E in the p.m. peak hour (worse than the LOS D under existing 2015 conditions)

Roadway Operations. As shown in **Table 4.11-12**, the same four roadway segments that currently operate at a poor LOS (LOS E or F) during one or both of the morning and evening peak hours would continue to operate poorly in 2018 without the proposed project; the remaining six segments would continue to operate at LOS D or better during both peak traffic hours.

Future Year 2018 With Project Conditions

This section provides the analysis of conditions (impacts) with project remediation activities (with 96 truck round trips per day and 250 worker round trips per day) in the study area at the start of remediation work.



SOURCE: KOA Corporation, 2016

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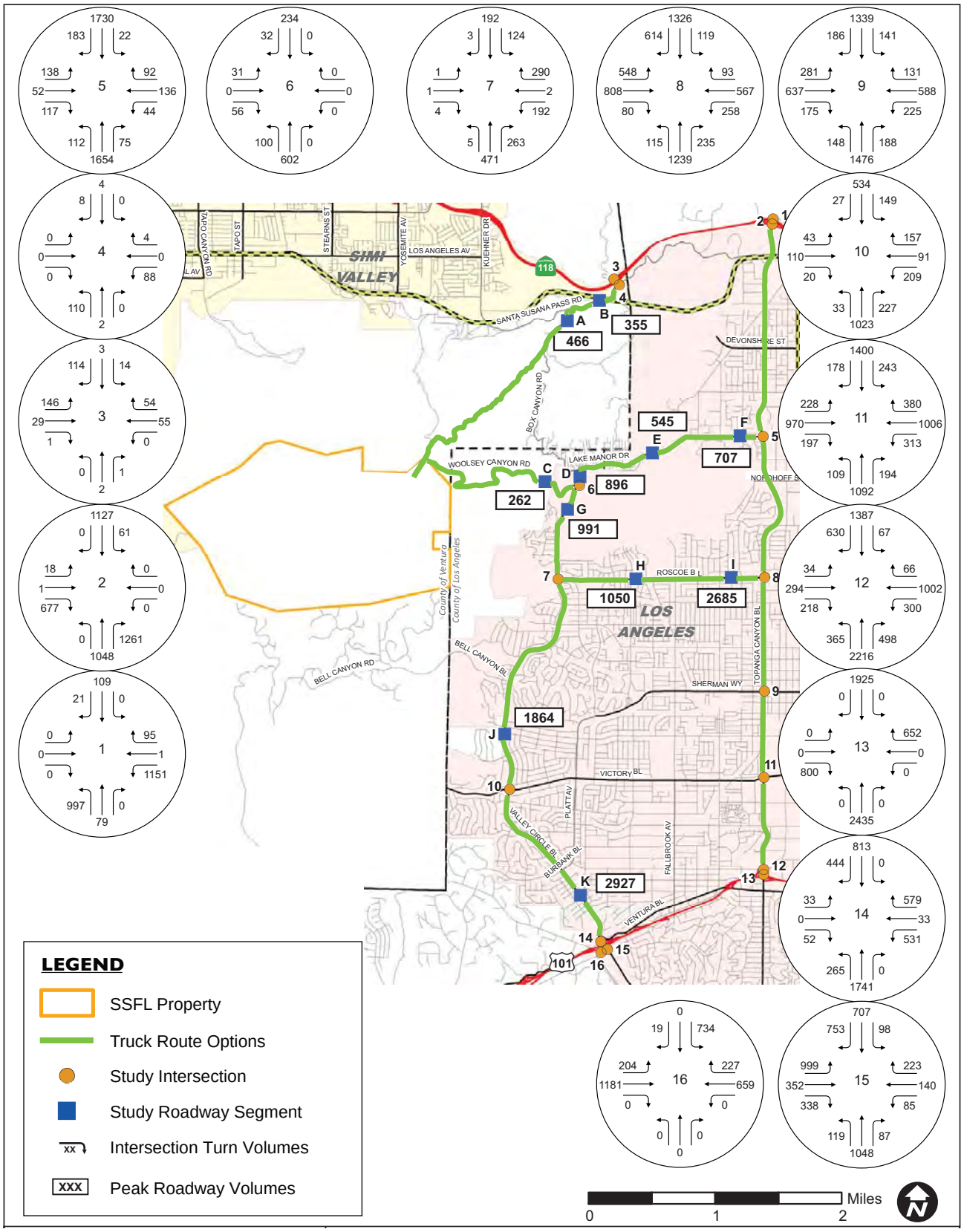
Figure 4.11-9

Year 2018 No Project AM Peak-Hour Intersection Traffic Volumes



SOURCE: KOA Corporation, 2016

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Figure 4.11-10

Year 2018 No Project PM Peak-Hour Intersection Traffic Volumes

TABLE 4.11-11
SUMMARY OF INTERSECTION LEVEL OF SERVICE (LOS)
(2018 WITHOUT PROJECT CONDITIONS)

		AM Peak Hour		PM Peak Hour	
Intersection	**Traffic Control [a]**	**V/C or Delay [b]**	**LOS**	**V/C or Delay [b]**	**LOS**
1. Topanga Canyon Blvd & SR 118 WB Ramps	Signal	0.809	D	0.876	D
2. Topanga Canyon Blvd & SR 118 EB Ramps	Signal	1.122	F	1.091	F
3. Rocky Peak Road & SR 118 WB Ramps	SSSC	11.6	B	11.3	B
4. Rocky Peak Road & Santa Susana Pass Road	SSSC	11.2	B	10.8	B
5. Topanga Canyon Blvd & Plummer Street	Signal	0.723	C	0.653	B
6. Valley Circle Blvd & Woolsey Canyon Road	AWSC	44.7	E	34.3	D
7. Valley Circle Blvd & Roscoe Blvd	Signal	0.725	C	0.529	A
8. Topanga Canyon Blvd & Roscoe Blvd	Signal	0.668	B	0.771	C
9. Topanga Canyon Blvd & Sherman Way	Signal	0.806	D	0.781	C
10. Valley Circle Blvd & Victory Blvd	Signal	0.699	B	0.512	A
11. Topanga Canyon Blvd & Victory Blvd	Signal	0.773	C	1.024	F
12. Topanga Canyon Blvd & Burbank Blvd	Signal	0.662	B	0.910	E
13. Topanga Canyon Blvd & US 101 NB Off-Ramp	SSSC	>100	F	>100	F
14. Valley Circle Blvd & US 101 NB Off-Ramp / Long Valley Road	Signal	1.020	F	0.781	C
15. Valley Circle Blvd & Calabasas Rd / Avenue San Luis	Signal	0.736	C	0.855	D
16. US 101 SB Ramps & Calabasas Road	Signal	0.585	A	0.895	A

[a] Signal = Traffic Signal; SSSC = Side-Street Stop-Control; AWSC = All-Way Stop-Control.

[b] V/C = Volume-to-Capacity Ratio, which is used to determine LOS at signalized intersections; Delay = Average delay (seconds per vehicle), which is used to determine LOS at unsignalized intersections.

SOURCE: KOA Corporation, 2017 (see Appendix H of this PEIR).

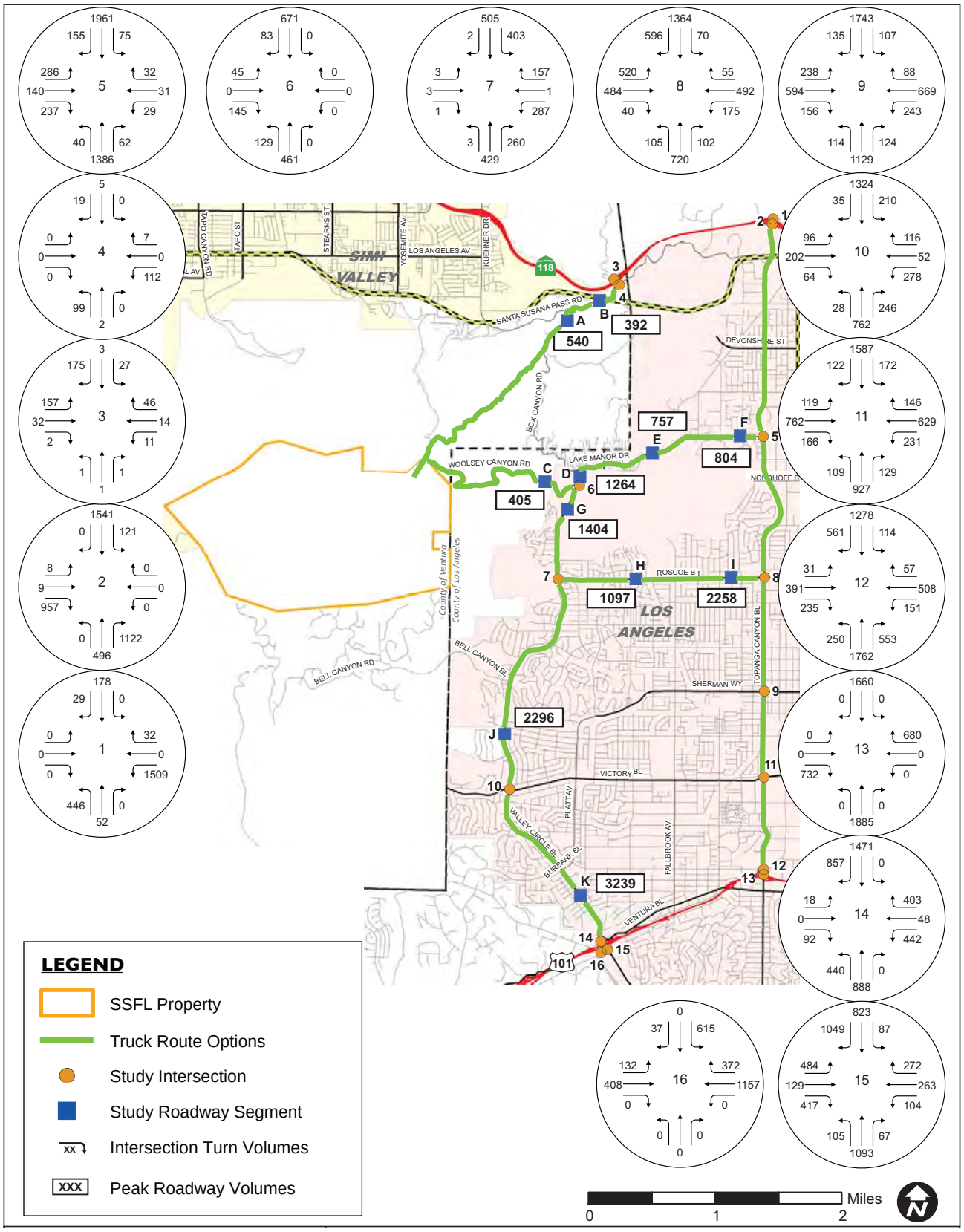
TABLE 4.11-12
SUMMARY OF PEAK-HOUR ROADWAY SEGMENT LEVEL OF SERVICE (LOS)
(2018 WITHOUT PROJECT CONDITIONS)

	Roadway	From	To	Peak Hour	Travel Lanes [a]	Capacity	Volume	V/C Ratio	LOS
A	Box Canyon Road	Santa Susana Pass Road	Roberson Road	AM	2	1,050	524	0.499	A
				PM			466	0.443	A
B	Santa Susana Pass Road	Rocky Peak Road	Box Canyon Road	AM	2	1,050	376	0.358	A
				PM			355	0.338	A
C	Woolsey Canyon Road	Valley Circle Boulevard	Knapp Ranch Road	AM	2	1,050	220	0.210	A
				PM			262	0.249	A
D	Valley Circle Boulevard	Box Canyon Road	Woolsey Canyon Road	AM	2	1,050	1,199	1.142	F
				PM			896	0.853	D
E	Valley Circle Boulevard	Plummer Street	Schumann Road	AM	2	1,050	708	0.674	B
				PM			545	0.519	A
F	Plummer Street	Valley Circle Boulevard	Farralone Avenue	AM	2	1,050	755	0.719	C
				PM			707	0.673	B
G	Valley Circle Boulevard	Woolsey Canyon Road	Chatlake Drive	AM	2	1,050	1,284	1.223	F
				PM			991	0.944	E
H	Roscoe Boulevard	Woodlake Avenue	Shoup Avenue	AM	4	2,500	1,029	0.412	A
				PM			1,050	0.420	A
I	Roscoe Boulevard	Shoup Avenue	Farralone Avenue	AM	4	2,500	2,190	0.876	D
				PM			2,685	1.074	F
J	Valley Circle Boulevard	Vanowen Street	Victory Boulevard	AM	4	2,500	2,244	0.898	D
				PM			1,864	0.746	C
K	Valley Circle Boulevard	Burbank Boulevard	US 101	AM	4	2,500	3,187	1.275	F
				PM			2,927	1.171	F

[a] Based on the most-constricted segment of the overall roadway.
SOURCE: KOA Corporation, 2017 (see Appendix H of this PEIR).

Intersection Operations. Figure 4.11-11 and **Figure 4.11-12** illustrate the 2018 with project a.m. and p.m. peak-hour traffic volumes at study intersections. As shown in **Table 4.11-13**, the following six study intersections (the same as identified above for the 2018 No-Project conditions) would continue to operate at a poor LOS (LOS E or F) during one or both of the morning and evening peak hours under 2018 with project conditions; the remaining ten intersections would continue to operate at LOS D or better during both peak traffic hours:

- #2 (Topanga Canyon Boulevard & SR 118 Eastbound Ramps): LOS F in both the a.m. and p.m. peak hours (same as under 2018 No-Project conditions, with increases of 0.019 and 0.032 in the V/C ratio, respectively). The increases in V/C ratio would exceed the County of Los Angeles and City of Los Angeles threshold of significance for intersections operating at LOS F, resulting in a significant impact.
- #6 (Valley Circle Boulevard & Woolsey Canyon Road): LOS F in both the a.m. and p.m. peak hours (same as 2018 No-Project conditions), and the peak-hour signal warrant would be met at this unsignalized intersection. The poor LOS and combination of traffic volumes on the two roads exceeding the peak-hour signal warrant threshold would result in a significant impact.
- #11 (Topanga Canyon Boulevard & Victory Boulevard): LOS E in the a.m. peak hour (same as under 2018 No-Project conditions, with no change to the V/C ratio); a less-than-significant impact.
- #12 (Topanga Canyon Boulevard & Burbank Boulevard): LOS E in the p.m. peak hour (same as under 2018 No-Project conditions, with no change to the V/C ratio); a less-than-significant impact.
- #13 (Topanga Canyon Boulevard & US 101 Northbound Off-Ramp): LOS F in the both the a.m. and p.m. peak hours (same as under 2018 No-Project conditions), and the peak-hour signal warrant would be met at this unsignalized intersection. The poor LOS and combination of traffic volumes on the two roads exceeding the peak-hour signal warrant thresholds result in a significant impact.
- #14 (Valley Circle Boulevard & US 101 Northbound Off-Ramp / Long Valley Road): LOS F in the a.m. peak hour (same as under 2018 No-Project conditions, with no change to the V/C ratio); less-than-significant impact.



SOURCE: KOA Corporation, 2016

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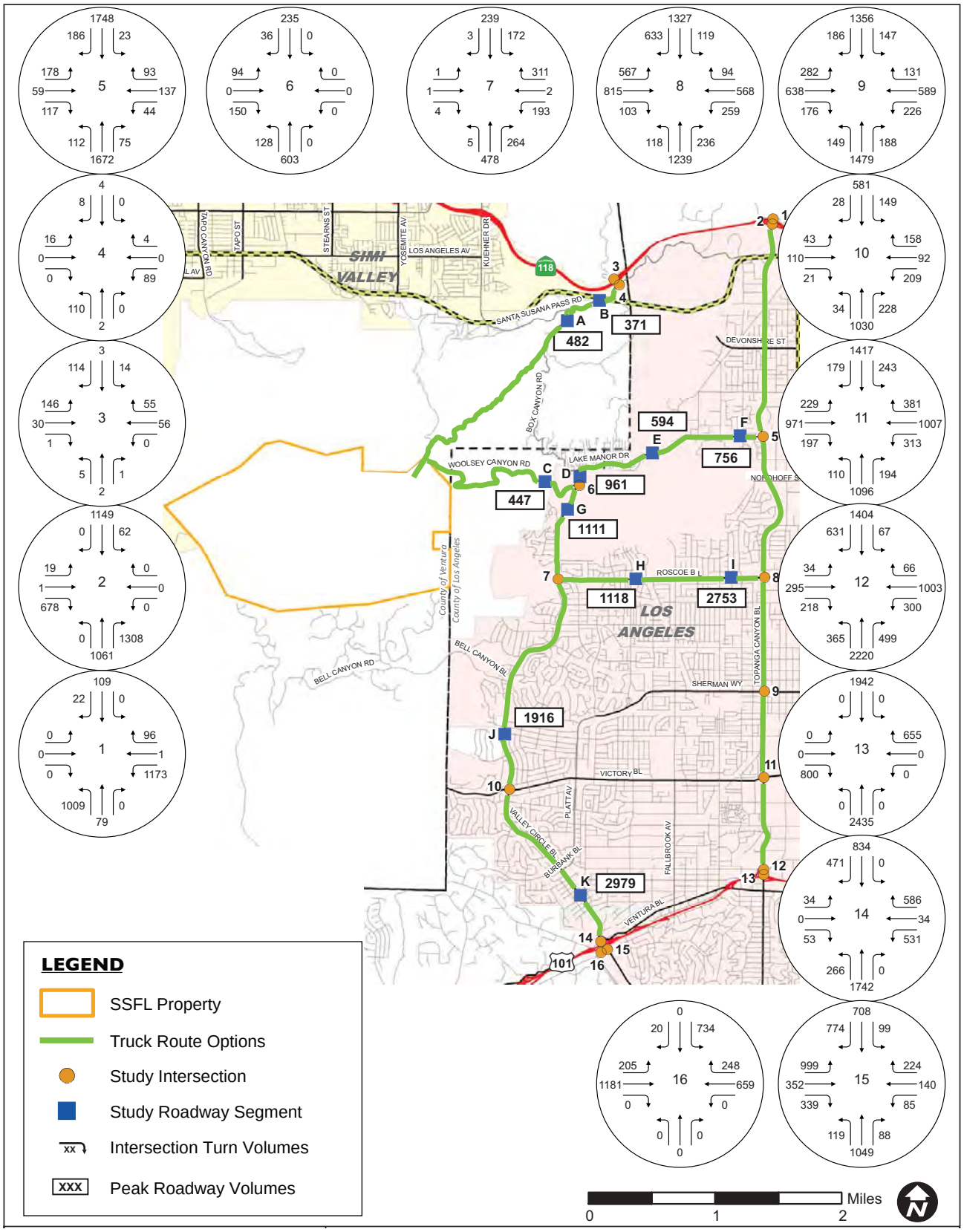
Figure 4.11-11

Year 2018 With Project AM Peak-Hour Intersection Traffic Volumes



SOURCE: KOA Corporation, 2016

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Figure 4.11-12

Year 2018 With Project PM Peak-Hour Intersection Traffic Volumes

TABLE 4.11-13
SUMMARY OF INTERSECTION LEVEL OF SERVICE (LOS)
(COMPARISON OF 2018 NO-PROJECT AND WITH-PROJECT CONDITIONS)

		2018 No Project				2018 With Project			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
Intersection	Traffic Control [a]	V/C or Delay [b]	LOS	V/C or Delay [b]	LOS	V/C or Delay [b]	LOS	V/C or Delay [b]	LOS
1. Topanga Canyon Blvd & SR 118 WB Ramps	Signal	0.809	D	0.876	D	0.827	D	0.888	D
2. Topanga Canyon Blvd & SR 118 EB Ramps	Signal	1.122	F	1.091	F	**1.141 (+0.019)**	**F**	**1.123 (+0.032)**	**F**
3. Rocky Peak Road & SR 118 WB Ramps	SSSC	11.6	B	11.3	B	11.6	B	11.5	B
4. Rocky Peak Road & Santa Susana Pass Road	SSSC	11.2	B	10.8	B	11.4	B	11.2	B
5. Topanga Canyon Blvd & Plummer Street	Signal	0.723	C	0.653	B	0.739	C	0.662	B
6. Valley Circle Blvd & Woolsey Canyon Road	AWSC	44.7	E	34.3	D	**58.0**	**F**	**57.3**	**F**
7. Valley Circle Blvd & Roscoe Blvd	Signal	0.725	C	0.529	A	0.761	C	0.564	A
8. Topanga Canyon Blvd & Roscoe Blvd	Signal	0.668	B	0.771	C	0.694	B	0.778	C
9. Topanga Canyon Blvd & Sherman Way	Signal	0.806	D	0.781	C	0.809	D	0.786	C
10. Valley Circle Blvd & Victory Blvd	Signal	0.699	B	0.512	A	0.701	C	0.513	A
11. Topanga Canyon Blvd & Victory Blvd	Signal	0.773	C	1.024	F	0.779	C	1.024	F
12. Topanga Canyon Blvd & Burbank Blvd	Signal	0.662	B	0.910	E	0.662	B	0.910	E
13. Topanga Canyon Blvd & US 101 NB Off-Ramp	SSSC	>100	F	>100	F	**>100**	**F**	**>100**	**F**
14. Valley Circle Blvd & US 101 NB Off-Ramp / Long Valley Rd	Signal	1.020	F	0.781	C	1.020	F	0.784	C
15. Valley Circle Blvd & Calabasas Road / Avenue San Luis	Signal	0.736	C	0.855	D	0.746	C	0.855	D
16. US 101 SB Ramps & Calabasas Road	Signal	0.585	A	0.895	A	0.595	A	0.598	A

[a] Signal = Traffic Signal; SSSC = Side-Street Stop-Control; AWSC = All-Way Stop-Control.

[b] V/C = Volume-to-Capacity Ratio (used to determine LOS at signalized intersections); Delay = Average delay (seconds per vehicle), which is used to determine LOS at unsignalized intersections.
Shaded Bold = Significant Impact, based on thresholds of significance described previously in Section 4.11.3.

SOURCE: KOA Corporation, 2017 (see Appendix H of this PEIR).

Roadway Operations. As shown in **Table 4.11-14**, the following five roadway segments (the same as identified previously for the 2018 No-Project conditions) would continue to operate at a poor LOS (LOS E or F) during one or both of the morning and evening peak hours under 2018 with project conditions, and project trips would increase the V/C ratio by 0.02 or more; the remaining six segments would continue to operate at LOS D or better during both peak traffic hours:

- #D (Valley Circle Boulevard: Box Canyon Road to Woolsey Canyon Road): LOS F in the a.m. peak hour and LOS E in the p.m. peak hour, with an increase in V/C ratio of 0.062 for both the a.m. and p.m. peak hours. The increases in V/C ratios would exceed the threshold of significance established for this analysis for road segments operating at LOS F, resulting in a significant impact.
- #G (Valley Circle Boulevard: Woolsey Canyon Road to Chatlake Drive): LOS F in both the a.m. and p.m. peak hours, with an increase in V/C ratio of 0.115 for both the a.m. and p.m. peak hours. The increases in V/C ratios would exceed the threshold of significance established for this analysis for road segments operating at LOS F, resulting in a significant impact.
- #I (Roscoe Boulevard: Shoup Avenue to Farralone Avenue): LOS E in the a.m. peak hour and LOS F in the p.m. peak hour, with an increase in V/C ratio of 0.027 for both the a.m. and p.m. peak hours. The increases in V/C ratio would exceed the threshold of significance established for this analysis for road segments operating at LOS F, resulting in a significant impact.
- #J (Valley Circle Boulevard: Vanowen Street to Victory Boulevard): LOS E in the a.m. peak hour, with an increase in V/C ratio of 0.021. The increase in V/C ratio would exceed the threshold of significance established for this analysis for road segments operating at LOS E or F, resulting in a significant impact.
- #K (Valley Circle Boulevard: Burbank Boulevard to US 101): LOS F in both the a.m. and p.m. peak hours, with an increase in V/C ratio of 0.021 for both the a.m. and p.m. peak hours. The increases in V/C ratio would exceed the threshold of significance established for this analysis for road segments operating at LOS F, resulting in a significant impact.

The significant impacts described in this section would be reduced by implementation of Mitigation Measure TRANS-1, which requires implementation of a DTSC-approved Site-Wide Traffic Management Plan that would identify common traffic-control requirements for onsite deliveries and offsite hauling to facilitate safe and efficient traffic flow on public roadways. The plan would provide specific traffic-control measures, signs, and delineators to be implemented by the construction contractor(s) through the duration of cleanup activities, and would require that truck activity associated with the remediation activities under the proposed project be limited to off-peak traffic hours (i.e., hours between the end of the a.m. peak traffic hour and the start of the p.m. peak hour). Avoidance of project-related truck trips traveling on area roadways during peak traffic hours would reduce impacts, but impacts of vehicle trips by project workers during peak traffic hours would exceed the thresholds of significance established for this analysis for intersections and road segments, and the impacts after implementation of Mitigation Measure TRANS-1 would be considered significant and unavoidable.

TABLE 4.11-14
SUMMARY OF PEAK-HOUR ROADWAY SEGMENT LEVEL OF SERVICE (LOS) – (COMPARISON OF 2018 NO-PROJECT AND WITH-PROJECT CONDITIONS)

	Roadway	From	To	Peak Hour	Travel Lanes [a]	Capacity	2018 No Project Volume	2018 No Project V/C	2018 No Project LOS	2018 With Project Volume	2018 With Project V/C	2018 With Project LOS
A	Box Canyon Road	Santa Susana Pass Rd	Roberson Road	AM	2	1,050	524	0.499	A	540	0.515	A
				PM			466	0.443	A	482	0.459	A
B	Santa Susana Pass Rd	Rocky Peak Road	Box Canyon Road	AM	2	1,050	376	0.358	A	392	0.373	A
				PM			355	0.338	A	371	0.354	A
C	Woolsey Canyon Rd	Valley Circle Blvd	Knapp Ranch Road	AM	2	1,050	220	0.210	A	405	0.386	A
				PM			262	0.249	A	447	0.425	A
D	Valley Circle Blvd	Box Canyon Road	Woolsey Canyon Rd	AM	2	1,050	1,199	1.142	F	1,264	**1.204 (+0.062)**	**F**
				PM			896	0.853	D	961	**0.915 (+0.062)**	**E**
E	Valley Circle Blvd	Plummer Street	Schumann Road	AM	2	1,050	708	0.674	B	757	0.721	C
				PM			545	0.519	A	594	0.566	A
F	Plummer Street	Valley Circle Blvd	Farralone Avenue	AM	2	1,050	755	0.719	C	804	0.766	C
				PM			707	0.673	B	756	0.720	C
G	Valley Circle Blvd	Woolsey Canyon Road	Chatlake Drive	AM	2	1,050	1,284	1.223	F	1,404	**1.338 (+0.115)**	**F**
				PM			991	0.944	E	1,111	**1.058 (+0.114)**	**F**
H	Roscoe Boulevard	Woodlake Avenue	Shoup Avenue	AM	4	2,500	1,029	0.412	A	1,097	0.439	A
				PM			1,050	0.420	A	1,118	0.447	A
I	Roscoe Boulevard	Shoup Avenue	Farralone Avenue	AM	4	2,500	2,190	0.876	D	2,258	**0.903 (+0.027)**	**E**
				PM			2,685	1.074	F	2,753	**1.101 (+0.027)**	**F**
J	Valley Circle Blvd	Vanowen Street	Victory Blvd	AM	4	2,500	2,244	0.898	D	2,296	**0.919 (+0.021)**	**E**
				PM			1,864	0.746	C	1,916	0.767	C
K	Valley Circle Blvd	Burbank Blvd	US 101	AM	4	2,500	3,187	1.275	F	3,239	**1.296 (+0.021)**	**F**
				PM			2,927	1.171	F	2,979	**1.192 (+0.021)**	**F**

[a] Based on the most-constricted segment of the overall roadway. Shaded Bold = Significant Impact, based on thresholds of significance described previously in Section 4.11.3.
SOURCE: KOA Corporation, 2017 (see Appendix H of this PEIR).

Conclusion: Compliance with Mitigation Measure TRANS-1 would reduce impacts of the initial activities related to effectiveness of the performance of the circulation system, but would not prevent such impacts from occurring. Impacts would be considered significant and unavoidable.

Impact 4.11-1b Determination: *The* ***initial activities*** *would substantially degrade traffic LOS at area intersections and on area roadways. Once completed, implementation of initial activities would not affect the area's traffic LOS because project-generated vehicle trips would cease when activities associated with site cleanup end. Mitigation Measure TRANS-1 would reduce direct or indirect impacts, but would not prevent such impacts from occurring. Therefore, impacts would be considered* ***significant and unavoidable****.*

4.11.5.2 Traffic Hazards or Incompatible Uses

Program Assessment

Impact 4.11-2a: Would implementation of the **overall site cleanup** substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Overall Site Cleanup (Impact 4.11-2a)

The proposed project would not result in any hazards due to design features, but truck trips generated by remediation activities would introduce incompatible uses (i.e., large vehicles) to a road network that is currently predominantly used by passenger cars. This would cause a potentially significant impact to pedestrian and/or bicycle safety. A review of traffic controls and pedestrian crossing points on roadways where project trucks would travel was conducted to determine if there are uncontrolled or unmarked crossing points that may need measures to improve pedestrian safety during the remediation period. In addition, a review of bicycle facilities (e.g., striped lanes and/or routes designated by signage) was conducted. The analyzed local routes for remediation trucks between the project site access points and the nearby SR 118 and US 101 freeways are Topanga Canyon Boulevard, Valley Circle Boulevard, Plummer Street, and Roscoe Boulevard.

The pedestrian analysis focused on areas that typically generate higher-than-average pedestrian volumes (i.e., neighborhoods with parks or schools). These locations were mapped within a one-half mile buffered distance from the analyzed roadway corridors; this distance is considered typical walking distance for pedestrian travel. Probable paths were then mapped from each point to a crossing point on the nearest analyzed roadway, and the overlap with traffic controls for safe crossing of the roadway was determined for each path.

In order to evaluate bicycle access impacts on roadways near the project site where truck traffic generated by the site remediation process would be traveling on two-lane roadways, bicycle

counts were conducted on Lake Manor Drive, Roscoe Boulevard, and Valley Circle Boulevard, in the relative vicinity of the project site.[7] A map of the bicycle count locations and the count summaries are provided in Appendix H of this PEIR. There were 14 or fewer bicyclists over the 4-hour weekday count periods at each of the three count locations, but those volumes are generally concentrated in 1 of the 4 hours. The Saturday bicycle activity is much higher than the weekday use of the roadways (particularly on Lake Manor Drive and Valley Circle Boulevard).

As described previously, daily truck trips generated by project-related remediation activities would be spread evenly over 8 hours[8] within a single 11-hour shift. Dividing the 96 daily truck round trips by an expected 8-hour period, there would be an average of 12 truck round trips per hour (one every 5 minutes).

The analyzed corridors and pedestrian routes are illustrated on figures in Appendix H of this PEIR. Existing traffic controls are included on these figures, including traffic signals, all-way stop signs, mid-block pedestrian crossing points with traffic signals, and striped/signed mid-block crosswalks. In general, pedestrian routes from most local neighborhoods with parks or schools have controlled locations with traffic signals at intersections, or crosswalks with warning lights at crossing points, on the analyzed roadways. The exceptions are as follows:

- Orcutt Ranch Horticultural Center Park – This park and events venue does not have a controlled or signed/striped pedestrian crossing point near its access point on Roscoe Boulevard (at the intersection of Roscoe Boulevard and Hillary Drive). Implementation of Mitigation Measure TRANS-1, which would require implementation of a DTSC-approved Site-Wide Traffic Management Plan, would identify common traffic-control requirements for onsite deliveries and offsite hauling to facilitate safe and efficient traffic flow on public roadways. The plan would provide specific traffic-control measures, signs, and delineators to be implemented by the construction contractor(s) through the duration of cleanup activities, and would require that truck activity associated with the remediation activities under the proposed project be limited to off-peak traffic hours (i.e., hours between the end of the a.m. peak traffic hour and the start of the p.m. peak hour). In addition, Mitigation Measure TRANS-1 requires that either a signed/striped crosswalk with warning lights or a temporary traffic signal would be installed at the intersection of Roscoe Boulevard / Hillary Drive to provide improved safety for crossing pedestrians. Mitigation Measure TRANS-1 would ensure that project-related traffic hazards would be less than significant for this park.

- Chatsworth Oaks Park – There are neither developed land uses nor a local neighborhood with pedestrian destinations across from the access point of this park on Valley Circle Boulevard.

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7 These counts were conducted on a weekday (Thursday, February 25, 2016) and a Saturday (Saturday, February 27, 2016). The weekday count time frames were from 6:00 a.m. to 10:00 a.m. (to capture bicycle commuters and recreational bicyclists on morning rides) and 2:00 p.m. to 6:00 p.m. (to capture early afternoon school trips made on bicycle and return commute trips). The weekend count time frame was from 7:00 a.m. to 11:00 am. (to capture morning recreational cyclists).

8 The a.m. and p.m. peak hours for each study intersection (i.e., the four highest consecutive 15-minute periods within each of the two-hour peak periods of 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.) vary somewhat (though are generally 7:15 a.m. to 8:15 a.m. and 4:45 p.m. to 5:45 p.m.), but the analysis presented herein provides peak traffic conditions for each single study intersection.

Pedestrian crossing activity here is low. No traffic-related hazard impacts are expected for this park.

- Castle Peak Park – This park has access points along the west side of Valley Circle Boulevard and at the intersection of Stonegate Drive / Valley Circle Boulevard. There are no destinations or neighborhoods accessible along the east side of Valley Circle Boulevard at this point. Pedestrian crossing activity here is low. No traffic-related hazard impacts are expected for this park.

Potential impacts associated with bicycle travel and increased truck-use of the earlier-cited roadways during the project remediation period are discussed in the following sub-sections.

Lake Manor Drive. As described above, under Project Trip Distribution, the expected truck trip distribution for the project remediation activities on this road is about 10 percent of the total project trucks volume. This translates to one or two trucks per hour over an 8-hour period each workday. Lake Manor Drive has striped shoulders that are potentially used by riders and provide some comfort level, and has a relatively low presence of hills and curves. Because of the minimal anticipated conflict issues between trucks and bicyclists on this roadway, bicycle safety impacts are considered to be less than significant.

Roscoe Boulevard. There are signed/striped bicycle lanes on this major roadway; it also has the lowest number of bicycle riders among the roads counted for this analysis. Because of the minimal anticipated conflict issues between trucks and bicyclists on this roadway, bicycle safety impacts are considered to be less than significant.

Valley Circle Boulevard. The 1.1-mile-long segment between Woolsey Canyon Road and Roscoe Boulevard is relatively narrow and hilly with curves; there are no striped bicycle lanes. Valley Circle Boulevard south of Roscoe Boulevard widens to four lanes and has striped bike lanes. As a great majority of the truck trips generated by project remediation activities would travel on Valley Circle Boulevard, the potential for safety conflicts between trucks and bicyclists on this roadway is considered a significant impact. Implementation of Mitigation Measure TRANS-1, which requires implementation of a DTSC-approved Site-Wide Traffic Management Plan that would identify common traffic-control requirements for onsite deliveries and offsite hauling to facilitate safe and efficient traffic flow on public roadways, would provide specific traffic-control measures, signs, and delineators to be implemented by the construction contractor(s) through the duration of cleanup activities, and would require that truck activity associated with the remediation activities under the proposed project be limited to off-peak traffic hours (i.e., hours between the end of the a.m. peak traffic hour and the start of the p.m. peak hour). In addition, Mitigation Measure TRANS-1 requires that truck activity associated with the remediation activities under the proposed project be limited to weekdays (Monday to Friday) only, avoiding the heaviest period of bicycle use, during the weekend. So that bicycle riders on the segment of Valley Circle Boulevard between Roscoe Boulevard and Lake Manor Drive would be made aware of the presence of the trucking operations on weekdays, Mitigation Measure TRANS-1 requires the installation of warning signs that state: “Truck activity ahead. Bicyclists use caution or alternative route.” Lastly, Mitigation Measure TRANS-1 requires that project contractors/truck

drivers be alerted to the presence of bicyclists on area roadways, particularly on the 1.1-mile segment of Valley Circle Boulevard between Woolsey Canyon Road and Roscoe Boulevard.

In addition, the use of large trucks to transport equipment and material to and from the project work sites could affect road conditions and driving safety on the designated haul routes by increasing the rate of road wear. The degree to which this impact would occur would depend on the design (pavement type and thickness) and existing condition of the road. Freeways and major arterials are designed to accommodate a mix of vehicle types, including heavy trucks; consequently, no significant wear and tear from trucks would be expected on US 101, SR 118, Topanga Canyon Boulevard, or Roscoe Boulevard. The pavement of local streets (e.g., Woolsey Canyon Road and Valley Circle Boulevard north of Roscoe Boulevard) generally is not thick enough to withstand substantial truck traffic volumes. The wear-and-tear effects on road conditions and driving safety are considered to be a significant impact. However, implementation of Mitigation Measure TRANS-2, which would establish requirements for restoring roads damaged by project-related traffic, would reduce potential impacts to a less-than-significant level.

> Conclusion: Implementation of the overall site cleanup would substantially increase hazards due to potential safety conflicts between trucks and pedestrians at the intersection of Roscoe Boulevard and Hillary Drive, between trucks and bicyclists on Valley Circle Boulevard, and increased wear and tear on road conditions. Implementation of Mitigation Measure TRANS-1 would reduce the potential for conflicts between project-related traffic with pedestrian and bicycle traffic and implementation of Mitigation Measure TRANS-2 would reduce impacts related to roadway damage. Therefore, impacts would be less than significant with mitigation incorporated.

Impact 4.11-2a Determination: *The* ***overall site cleanup*** *would substantially increase hazards due to potential safety conflicts between trucks and pedestrians at the intersection of Roscoe Boulevard and Hillary Drive, between trucks and bicyclists on Valley Circle Boulevard, and due to increased wear and tear on local roads used as haul routes. Mitigation Measures TRANS-1 and TRANS-2 would reduce these impacts to less than significant. Therefore, impacts would be* ***less than significant with mitigation incorporated****.*

Initial Project Assessment

Impact 4.11-2b: Would implementation of the **initial activities** substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Initial Activities (Impact 4.11-2b)

The initial activities described in Section 3.7 of this PEIR would involve soil excavation and disposal, building demolition, and maintenance activities in all four administrative areas and the northern undeveloped area. These activities would not increase the earlier-described maximum number of trucks (96 round trips) traveling on roads each day. Also, the same types of vehicles, intersections, and roadways would be used for the initial activities as for the overall cleanup

project. The types of potential traffic hazards would be the same as anticipated for the overall cleanup project. There would be no significant traffic safety impacts associated with the initial activities that have not been identified previously. To the degree the number of daily trucks would be lower than these maximum numbers, impacts would be less than described previously. However, the earlier-described significant impact associated with the absence of pedestrian crossing controls on Roscoe Boulevard near the Orcutt Ranch Horticultural Center Park, and with bicyclists on Valley Circle Boulevard, would be the same for the initial activities as previously identified for the overall site cleanup.

Implementation of Mitigation Measure TRANS-1, which requires implementation of a DTSC-approved Site-Wide Traffic Management Plan, would identify common traffic-control requirements for onsite deliveries and offsite hauling to facilitate safe and efficient traffic flow on public roadways. The plan would provide specific traffic-control measures, signs, and delineators to be implemented by the construction contractor(s) through the duration of cleanup activities, and would require that truck activity associated with the remediation activities under the proposed project be limited to off-peak traffic hours (i.e., hours between the end of the a.m. peak traffic hour and the start of the p.m. peak hour). In addition, Mitigation Measure TRANS-1 requires that truck activity associated with the remediation activities under the proposed project be limited to weekdays (Monday to Friday) only. So that bicycle riders on the segment of Valley Circle Boulevard between Roscoe Boulevard and Lake Manor Drive would be made aware of the presence of the trucking operations on weekdays, Mitigation Measure TRANS-1 requires the installation of warning signs that state: “Truck activity ahead. Bicyclists use caution or alternative route.” Mitigation Measure TRANS-1 requires that project contractors/truck drivers would be alerted to the presence of bicyclists on area roadways, particularly on the 1.1-mile segment of Valley Circle Boulevard between Woolsey Canyon Road and Roscoe Boulevard. The wear-and-tear effects on road conditions and driving safety are considered to be a significant impact. However, implementation of Mitigation Measure TRANS-2, which would establish requirements for restoring roads damaged by project-related traffic, would reduce potential impacts to a less-than-significant level.

> Conclusion: Implementation of the initial activities would substantially increase hazards due to potential safety conflicts between trucks and pedestrians at the intersection of Roscoe Boulevard and Hillary Drive, between trucks and bicyclists on Valley Circle Boulevard, and due to increased wear and tear on road conditions. Implementation of Mitigation Measure TRANS-1 would reduce the potential for conflicts between project-related traffic with pedestrian and bicycle traffic, and implementation of Mitigation Measure TRANS-2 would reduce impacts related to roadway damage. Therefore, impacts would be less than significant with mitigation incorporated.

Impact 4.11-2b Determination: *The **initial activities** would substantially increase hazards due to potential safety conflicts between trucks and pedestrians at the intersection of Roscoe Boulevard and Hillary Drive, between trucks and bicyclists on Valley Circle Boulevard, and due to increased wear and tear on local roads used as haul routes. Mitigation Measures TRANS-1 and TRANS-2 would reduce these impacts to less than significant. Therefore, impacts would be **less than significant with mitigation incorporated**.*

4.11.5.3 Emergency Access

Program Assessment

Impact 4.11-3a: Would implementation of the **overall site cleanup** result in inadequate emergency access?

Overall Site Cleanup (Impact 4.11-3a)

The roadway network serving the project site currently accommodates the movements of emergency vehicles that travel in the area. The proposed project would not require any lane or road closures, and would not entail activities that could substantially affect access to adjacent land uses or impede emergency access. Project-generated trucks on area roadways would interact with other vehicles. Drivers could experience delays if they were traveling behind a truck because a truck may be moving somewhat slower than a passenger vehicle, but access to roads and land uses would not be impaired in any substantial manner.

As discussed in Section 4.7, *Hazards and Hazardous Materials*, of this PEIR, under Impact 4.7-4a, specific segments of Valley Circle Boulevard, which would be accessed by all four proposed haul routes, are part of a designated Secondary Disaster Route; part of Roscoe Boulevard also is a designated Secondary Disaster Route. US 101, SR 218, and SR 27/Topanga Canyon Boulevard are designated Primary Disaster Routes. The increased traffic on these roads could interfere with emergency evacuation routes. However, with implementation of Mitigation Measure TRANS-1, truck trips would be limited to off-peak traffic hours, when traffic levels on these roads are lower, and would also require the use of onsite borrow pits and the same trucks for hauling backfill and removing contaminated soil, which would reduce truck trips on public roadways. As such, project-related traffic would not interfere with evacuation routes, and impacts would be less than significant with mitigation incorporated.

> Conclusion: Implementation of overall site cleanup would not substantially impede movement of, and access for, emergency vehicles. In addition, once completed, implementation of the overall site cleanup would have no effect on emergency access. Therefore, impacts would be less than significant with mitigation incorporated.

Impact 4.11-3a Determination: *The **overall site cleanup** would not substantially impede movement of, and access for, emergency vehicles; however, it could impair implementation of an emergency evacuation plan. Implementation of Mitigation Measure TRANS-1 would reduce this impact to less than significant. In addition, once completed, implementation of the overall site cleanup would have no effect on emergency access. Therefore, impacts would be **less than significant with mitigation incorporated**.*

Initial Project Assessment

Impact 4.11-3b: Would implementation of the **initial activities** result in inadequate emergency access?

Initial Activities (Impact 4.11-3b)

The initial activities described in Section 3.7 of this PEIR would involve soil excavation and disposal, building demolition, and maintenance activities in all four administrative areas and the northern undeveloped area. These activities would not increase the earlier-described maximum number of trucks (96 round trips) or workers (250 round trips) accessing the site each day (and in fact are estimated to have approximately 90 worker round trips). As discussed previously for impact 4.11-3a, specific segments of Valley Circle Boulevard, which would be accessed by all four proposed haul routes, are part of a designated Secondary Disaster Route; part of Roscoe Boulevard also is a designated Secondary Disaster Route. US 101, SR 218, and SR 27/Topanga Canyon Boulevard are designated Primary Disaster Routes. The increased traffic on these roads from the initial activities could interfere with emergency evacuation routes. However, with implementation of Mitigation Measure TRANS-1, truck trips would be limited to off-peak traffic hours, when traffic levels on these roads are lower, and would also require the use of onsite borrow pits and the same trucks for haling backfill and removing contaminated soil, which would reduce truck trips on public roadways. As such, project-related traffic would not interfere with evacuation routes and impacts would be less than significant with mitigation incorporated.

Therefore, there would be no significant impacts to emergency vehicle access associated with the initial activities than have been identified previously for the overall cleanup project.

> Conclusion: Implementation of the initial activities would not substantially impede movement of, and access for, emergency vehicles. In addition, once completed, implementation of the initial activities would have no effect on emergency access. Therefore, impacts would be less than significant with mitigation incorporated.

Impact 4.11-3b Determination: *The **initial activities** would not substantially impede movement of, and access for, emergency vehicles; however, they could impair implementation of an emergency evacuation plan. Implementation of Mitigation Measure TRANS-1 would reduce this impact to less than significant. In addition, once completed, implementation of the overall site cleanup would have no effect on emergency access. Therefore, impacts would be **less than significant with mitigation incorporated**.*

4.11.6 Mitigation Measures

The following measures shall be implemented to mitigate impacts related to transportation and traffic:[9]

TRANS-1: Site-Wide Traffic Management Plan. Prior to the beginning of remediation activities, the RPs shall prepare a comprehensive Site-Wide Traffic Management Plan that identifies common traffic-control requirements for onsite deliveries and offsite hauling to facilitate safe and efficient traffic flow within SSFL and on public roadways. This plan shall be submitted to DTSC for review. The criteria for haul routes shall avoid direct routing through sensitive habitat areas and areas with residential dwellings, schools, and bike routes unless no alternative is available. The Plan shall establish, list, and map the trucking routes, days and hours of truck operation, maximum number of trucks per day, and various requirements to provide traffic, pedestrian, and bicycle safety. Truck operators shall be provided with a trucking route map and hours of operation allowed. The Plan shall designate an onsite coordinator for project activities. The Plan shall provide specific traffic-control measures, signs, and delineators to be implemented by the construction contractor(s) through the duration of cleanup activities. In addition, the RPs, under the direction of DTSC, shall be responsible for funding and overseeing trip reduction programs and strategies.

At a minimum, the Plan shall include, but would not be necessarily limited to, the following elements:

- Limit use of public roads by trucks associated with the remediation activities under the proposed project to off-peak traffic hours (i.e., hours between the end of the a.m. peak traffic hour and the start of the p.m. peak hour).
- Limit truck activity associated with the remediation activities under the proposed project to weekdays (Monday through Friday) only.
- Install either a signed/striped crosswalk with warning lights or a temporary traffic signal at the intersection of Roscoe Boulevard/Hillary Drive to provide improved safety for crossing pedestrians.
- Install warning signs that state: “Truck activity ahead. Bicyclists use caution or alternative route;” this way bicycle riders on the segment of Valley Circle Boulevard between Roscoe Boulevard and Lake Manor Drive would be made aware of the presence of the trucking operations.
- Alert project contractors/truck drivers to the presence of bicyclists on area roadways, particularly on the 1.1-mile segment of Valley Circle Boulevard between Woolsey Canyon Road and Roscoe Boulevard.
- As feasible, Boeing shall use backfill material from borrow areas located in the Southern Undeveloped Area of the SSFL site.

[9] Some of the mitigation measures in this section include recommendations from USEPA’s: *Green Remediation: Best Management Practices for Excavation and Surface Restoration*, December 2008.

- To reduce the overall number of trucks traveling to and from the site, as feasible, trucks used to haul contaminated soil away from the site shall arrive at the site loaded with clean backfill.
- Funding and/or overseeing the following trip reduction programs or strategies:
  - Establishment of carpool, buspool, or vanpool programs
  - Cash allowances, passes, or other public transit subsidies and purchase incentives.
  - Computerized commuter rideshare matching services.

TRANS-2: Public Roadway Repair. The RPs, under the direction of DTSC, shall be responsible for restoring all public roads, easements, rights-of-way (ROWs) and infrastructure (such as signs, utility poles, etc.) within the public road ROWs that have been damaged from project-related activities or traffic through implementation of a Road Restoration Plan. Restoration shall be to original or near-original pre-project condition and undertaken in a timely manner, in consultation and to the satisfaction of the City of Los Angeles, County of Los Angeles, City of Simi Valley, County of Ventura, and Caltrans, as appropriate. At a minimum, the RPs shall:

- Provide a video log of the proposed haul route.
- Determine the current Pavement Condition Index (PCI) of the haul route roadways.
- Propose locations to place traffic axle counters to measure project-related traffic.
- Identify the funding mechanism for identified roadway maintenance. The RPs shall be responsible for all costs.
- Identify the frequency (semi-annual or annual) of road inspections during remediation activities and a mechanism for investigating complaints related to substantial road damage.

At least 30 days prior to the start of cleanup activities, the RPs, under the direction of DTSC, shall establish baseline road conditions by photographing, videotaping, or otherwise documenting existing conditions of all affected public roads, easements, ROW segment(s), and intersections, and shall provide the City of Los Angeles, County of Los Angeles, City of Simi Valley, County of Ventura, and Caltrans (if applicable) a copy of these documents. Prior to the start of remediation activities, the RPs, under the direction of DTSC, shall enter into a Roadway Repair Agreement with the City and County Public Works Departments in a form of documentation acceptable to each agency, secure an Encroachment Permit, and post a cash damage bond.

Prior to DTSC certification that each RP has completed its portion of cleanup activities, the RPs shall meet with the City of Los Angeles, County of Los Angeles, City of Simi Valley, County of Ventura, and Caltrans (if applicable) to review the baseline road conditions and identify sections of public ROW that may have been damaged by project activities. At that time (prior to DTSC certification that each RP has completed its portion of cleanup activities), the RPs shall establish a schedule to complete the repairs or compensate the City of Los Angeles, County of Los Angeles, City of Simi Valley,

County of Ventura, or Caltrans in accordance with the Roadway Repair Agreement. Following completion/compensation of the identified public ROW repairs, the RPs shall provide a letter to DTSC from affected jurisdictions (City of Los Angeles Department of Transportation, County of Los Angeles Department of Public Works, City of Simi Valley Department of Public Works, County of Ventura Public Works Agency, and Caltrans) stating their satisfaction with the repairs/compensation. Compliance with monitoring plans shall be verified by DTSC, in consultation with the City and County of Los Angeles, City of Simi Valley, County of Ventura, and Caltrans.

4.11.7 Impact Summary

Table 4.11-15 summarizes the proposed project's impacts and significance determinations related to Transportation and Traffic.

TABLE 4.11-15
PROPOSED PROJECT IMPACTS

Impact	Overall Project	DOE Initial Project	NASA Initial Project	DOE Demolition Activities	RCRA Post-Closure and Facility Closure	Mitigation Measures
Impact 4.11-1a: Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system.	S&U	--	--	--	--	TRANS-1
Impact 4.11-1b: Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system	--	S&U	S&U	S&U	S&U	TRANS-1
Impact 4.11-2a: Increased traffic safety hazards	LSM	--	--	--	--	TRANS-1 TRANS-2
Impact 4.11-2b: Increased traffic safety hazards	--	LSM	LSM	LSM	LSM	TRANS-1 TRANS-2
Impact 4.11-3a: Adequate emergency vehicle access	LSM	--	--	--	--	TRANS-1
Impact 4.11-3b: Adequate emergency vehicle access	--	LSM	LSM	LSM	LSM	TRANS-1

S&U = Significant and unavoidable
LSM = Less than significant with mitigation incorporated

4.12 Utilities and Service Systems

This section analyzes the potential effects of the overall site cleanup and initial activities on utilities and service systems. The existing setting is described along with the relevant regulatory background. The analysis focuses on whether the project's solid waste generation would be accommodated by existing and future infrastructure and proposes mitigation measures as needed. The analysis in this section was prepared based on review of government databases, personal communication, and available reports.

4.12.1 Environmental Setting

4.12.1.1 Existing Conditions

There are various activities at the project site that generate waste. However, the amount of current waste generated at the project site is considered negligible. Several portable field offices occupied by Boeing and NASA staff are located onsite and are associated with ongoing contamination monitoring and categorization studies. Waste generation associated with field offices includes municipal solid waste—more commonly known as trash (e.g., food scraps, newspapers, paper, appliances, and packaging). Waste management services transport the minimal amount of solid waste from SSFL to one of the nearby transfer stations, then to a disposal facility.

Boeing maintains modular offices, located in the northeast portion of the site. Boeing's activities include soil and groundwater investigations, surface water compliance activities, and community outreach, including public tours of the site. DOE does not have offices at the project site. DOE's offices are located at 4100 Guardian Street in Simi Valley. North Wind, DOE's contractor, maintains a small office at the RMHF located on the project site. DOE's current activities at the project site include the required groundwater monitoring activities, the required inspections, and surveillance and maintenance. NASA maintains a mobile office trailer for site management activities. The office trailer is co-located with supporting Conex containers and portable bathrooms. On occasion, contractors establish temporary field offices in the vicinity of areas of operation throughout Area II. NASA's activities at the site include environmental remediation investigation, cleanup activities, and demolition of existing facilities.

Current operations onsite include monitoring and maintenance for the existing groundwater extraction and treatment system and the existing surface water treatment systems. In support of the continuing activities, each RP has employees or contractors accessing the site daily. Boeing has 15 employees and 15 contractors, DOE has one employee, and NASA has five employees or contractors. These personnel and their activities generate a minimal amount of waste that must be adequately disposed. Municipal waste is produced, and some remedial activities generate industrial waste as well. Waste management services the project site and disposes of the municipal waste in nearby landfills, including the Simi Valley Landfill and Recycling Center and Clean Harbors Buttonwillow. Industrial waste is treated and disposed of at Clean Harbors Buttonwillow.

Solid Waste Facilities

The cleanup activities would be served by various disposal facilities operated by counties, cities, and private operators. Solid waste facilities consist of commercial Class I, II, and III landfills. Class I sites may accept hazardous and non-hazardous wastes; Class II sites may accept "designated" and non-hazardous wastes; and Class III sites may accept non-hazardous wastes. **Table 4.12-1** lists the facilities considered for disposal of soil and sediments removed from the site and their remaining capacities.

4.12.2 Regulatory Setting

4.12.2.1 Federal

The primary federal agency with responsibility for solid waste management is the USEPA. Regulations promulgated under RCRA (40 CFR, Part 258 Subpart D establish minimum location standards for siting municipal solid waste landfills. Because California laws and regulations governing the approval of solid waste landfills meet the requirements of Subtitle D, the USEPA has delegated the enforcement responsibility to the State of California. RCRA applies to this program because RCRA is used to define hazardous materials; offsite disposal facilities and the wastes each may accept are regulated under RCRA. The DOE and NASA portions of the project site are under federal jurisdiction; investigation and cleanup for federal areas are regulated under RCRA.

4.12.2.2 State

The primary State agency with jurisdiction over solid waste handling is DTSC. Another State agency involved in solid waste is the California Department of Resources Recycling and Recovery (CalRecycle). Solid waste management laws in California include the following statutes and regulations promulgated there under.

- California Integrated Waste Management Act of 1989 – The California Integrated Waste Management Act of 1989 (AB 939) redefined solid waste management in terms of both objectives and planning responsibilities for local jurisdictions and the state. AB 939 was adopted in an effort to reduce the volume and toxicity of solid waste that is landfilled and incinerated by requiring local governments to prepare and implement plans to improve the management of waste resources. AB 939 required each of the cities and unincorporated portions of the counties to divert a minimum of 25 percent of the solid waste sent to landfills by 1995 and 50 percent by the year 2000. Later laws have added a non-binding goal of eventually reaching 75 percent diversion by 2020. To attain goals for reductions in disposal, AB 939 established a planning hierarchy using new integrated solid waste management practices. These practices include source reduction, recycling and composting, and environmentally safe landfill disposal and transformation. Other state statutes pertaining to solid waste include compliance with the California Solid Waste Reuse and Recycling Act of 1991 (AB 1327), which requires adequate areas for collecting and loading recyclable materials within a project site. As a waste generator, the project would be subject to the requirements of these solid waste provisions, as enforced by the County of Ventura.

TABLE 4.12-1
DISPOSAL FACILITIES

Disposal Facility	State	Type of Waste	Estimated Closure Date	Maximum Daily Permitted Throughput [tons per day(tpd)]	Remaining Landfill Capacity
Antelope Valley Landfill	CA	Non-hazardous, Class III	2042	3,560 tpd	20,400,000 CY[1]
Azusa Land Reclamation	CA	Non-hazardous, Class III	2045	8,000 tpd	51,500,000 CY[2]
Chiquita Canyon Landfill	CA	Non-hazardous, Class III	2019	6,000 tpd	8,620,000CY[3]
Clean Harbors Aragonite (incineration only)	UT	Non-hazardous and hazardous NRC	Will permit into 2022, expected to renew 10 year permit	312 tpd	This facility sends the incineration residue to Clean Harbors Grassy Mountain landfill (see capacity information below)
Clean Harbors Buttonwillow	CA	Non-hazardous and Hazardous, Class I	2045	4,050 tpd hazardous waste; 1,100 tpd nonhazardous waste	500,000 CY[4]
Clean Harbors Colfax	LA	Non-hazardous and Hazardous	No expected closure date anticipated		540,000 lb of net explosive weight[5]
Clean Harbors Deer Trail	CO	Non-hazardous and Hazardous naturally occurring radioactive material (NORM) and technologically enhanced naturally occurring radioactive material (TENORM)	Will permit into 2100		No maximum reported at this time
Clean Harbors Deer Park	TX	Non-hazardous and Hazardous	Will permit into 2100		268,000 CY[6]
Clean Harbors Grassy Mountain	UT	Non-hazardous and hazardous Nuclear Regulatory Commission license-exempt material; Utah permit only allows for acceptance of radioactive material that is not licensable by the Utah Division of Radiation Control or the Nuclear Regulatory Commission, or waste found to have a count rate as measured 1 inch from the surface that exceeds background by less than 40 microR/hr	Will permit into 2100		RCRA drum storage: 2,220 55-gallon containers PCB drum storage: 350 55-gallon equivalent containers and two 3,000-gallon tanks RCRA landfill capacity: 711,000 CY Toxic Substances Control Act (TSCA) landfill capacity: 774,000 CY Bulk solids container capacity: 100 20-CY-equivalent containers Wide range of permitted waste codes PCB liquid storage for 64,000 gallons[7]
Clean Harbors Westmorland	CA	RCRA Class I (hazardous), APHIS soils, and California-regulated waste materials	Will permit into 2100		No maximum reported at this time

Disposal Facility	State	Type of Waste	Estimated Closure Date	Maximum Daily Permitted Throughput [tons per day(tpd)]	Remaining Landfill Capacity
Energy Solutions	UT	Non-hazardous and Hazardous. Low-level radioactive waste (LLRW), NORM/NARM, PCB radioactive waste, mixed waste (i.e., both radioactive and hazardous), and 11e.(2) byproduct material	Unreported		8,000,000 CY[8]
Chemical Waste Management, Kettleman Hills Facility[9]	CA	Non-hazardous and Hazardous	2045	8,000 tpd	4,900,000 CY
Kramer Metals	CA	Non-hazardous	N/A		N/A
La Paz County Landfill	AZ	Non-hazardous and Hazardous	No estimated closure date	No daily maximum capacity	Unreported
Lancaster Landfill & Recycling Center	CA	Non-hazardous	2090	5,100 tpd	11,200,000 CY[10]
McKittrick Waste Treatment Site	CA	Non-hazardous	2059	3,500 tpd	770,000 CY[11]
Mesquite Regional Landfill	CA	Non-hazardous	2122	20,000 tpd	1.1 billion tons [12]
Nevada National Security Site (NNSS)[B]	NV	DOE generated LLRW only. Non-DOE use only under special arrangements with DOE.	N/A		1,800,000 CY[13]
Simi Valley Landfill and Recycling Center	CA	Non-hazardous	2052	9,250 tpd	120,000,000 CY[14]
Soil Safe	CA	Petroleum-based contaminated waste	N/A	5,000 tpd	307,000 CY[15]
Southwest Treatment Systems, Inc.	CA	Non-hazardous (liquids)	No expected closure date as the facility receives, treats and discharges		577 capacity units[16]
Standard Industries	CA	Non-hazardous scrap metals	Unreported		Unreported
US Ecology, Beatty	NV	Non-hazardous and Hazardous	2019	No daily capacity maximum	580,000 CY[16]
US Ecology, Richland[A]	WA	Non-hazardous and hazardous NRC license-exempt material, NORM and naturally occurring and/or accelerator-produced radioactive material (NARM) from any US compact states[A]	2056		50 acres of licensed land is available to receive NRC license exempt material, NORM and NARM; the facility develops capacity as the need arises [17]

Disposal Facility	State	Type of Waste	Estimated Closure Date	Maximum Daily Permitted Throughput [tons per day(tpd)]	Remaining Landfill Capacity
US Ecology, Grand View	ID	Non-hazardous, hazardous, and NRC License-exempt material, NORM and TENORM	2136	No daily capacity maximum	10,800,000 CY[18]

Notes:

A LLRW from California is not accepted at US Ecology Richland. Only LLRW from the Northwest and Rocky Mountain Compact states are accepted at this facility and California is in the Southwest Compact.

B As discussed in the December 30, 2014, Record of Decision (79 Federal Register [FR] 78421) for the *Final Site-Wide Environmental Impact Statement for the Continued Operation of the Department of Energy/National Nuclear Security Administration Nevada National Security Site and Off-Site Locations in the State of Nevada*, DOE decided to dispose of up to 48 million cubic feet (1.8 million cubic yards) of DOE LLW. Additional disposal units would be developed at NNSS consistent with this Record of Decision.

C All numbers in this table were rounded to three significant figures

Sources:

1 CalRecycle, Facility/Site Summary Details: Antelope Valley Public Landfill (19-AA-5624), http://www.calrecycle.ca.gov/SWFacilities/Directory/19-AA-5624/Detail/, accessed September 27, 2016.

2 CalRecycle, Facility/Site Summary Details: Azusa Land Reclamation Co. Landfill (19-AA-0013), http://www.calrecycle.ca.gov/SWFacilities/Directory/19-AA-0013/Detail/, accessed October 19, 2016.

3 CalRecycle, Facility/Site Summary Details: Chiquita Canyon Sanitary Landfill (19-AA-0052), http://www.calrecycle.ca.gov/SWFacilities/Directory/19-AA-0052/Detail, accessed October 19, 2016.

4 Nielsen, David, Clean Harbors Buttonwillow, telephone conversation on March 31, 2016.

5 Clean Harbors Colfax, telephone conversation on July 20, 2016.

6 Clean Harbors, 2015 Annual Report, http://ir.cleanharbors.com/phoenix.zhtml?c=96527&p=irol-reportsannual, page 61, accessed October 19, 2016.

7 Clean Harbors, Transportation and Disposal: Grassy Mountain, Utah Facility Facts, http://www.cleanharbors.com/location/grassy-mountain-landfill-facility, accessed December 8, 2016.

8 National Aeronautics and Space Administration (NASA), Environmental Impact Statement (EIS) for Demolition and Environmental Cleanup Activities at Santa Susana Field Laboratory in California, https://www.nasa.gov/agency/nepa/news/SSFL.html#.WBkofC0rLRZ, 2014.

9 Estimated Closure Date: https://www.wmsolutions.com/pdf/brochures/CWM_Kettleman_Hills_Brochure.pdf
Maximum Daily Throughput: CalRecycle, Facility/Site Summary Details: Kettleman Hills – B18 Nonhaz Codisposal (16-AA-0023), http://www.calrecycle.ca.gov/SWFacilities/Directory/16-AA-0023/Detail/, accessed October 19, 2016.
Remaining Landfill Capacity: https://www.wmsolutions.com/pdf/brochures/CWM_Kettleman_Hills_Brochure.pdf.

10 Lavrinc, Richard, Lancaster Landfill and Recycling Center, telephone conversation, on March 31, 2015.

11 CalRecycle, Facility/Site Summary Details: McKittrick Waste Treatment Site (15-AA-0105), http://calrecycle.ca.gov/SWFacilities/Directory/15-AA-0105/Detail/, accessed October 19, 2016.

12 Mesquite Regional Landfill (Sanitation Districts of Los Angeles County), official website, Site Information, http://www.calrecycle.ca.gov/SWFacilities/Directory/13-AA-0026/Detail/, access December 15, 2016.

13 December 30, 2014, Record of Decision (79 Federal Register [FR] 78421) for the Final Site-Wide Environmental Impact Statement for the Continued Operation of the Department of Energy/National Nuclear Security Administration Nevada National Security Site and Off-Site Locations in the State of Nevada., https://www.federalregister.gov/documents/2014/12/30/2014-30594/record-of-decision-for-the-continued-operation-of-the-department-of-energynational-nuclear-security.

14 Calrecycle, Facility/Site Summary Details: Simi Valley Landfill & Recycling Center (56-AA-0007), http://www.calrecycle.ca.gov/SWFacilities/Directory/56-AA-0007/Detail/, accessed on October 19, 2016.

15 Provansal, Joe, Customer Services for Soil Safe, telephone conversation on September 10, 2015.

16 Pecoraro, Tony, Southwest Treatment Processors, telephone conversation on July 20, 2016.

17 Kania, David, Assistant Facility Manager at US Ecology Richland, telephone conversation, July 20, 2016.

18 Geis, Terry, Manager US Ecology Grandview, telephone conversation March 31, 2015.

- California Hazardous Waste (aka "Non-RCRA Hazardous Waste") and *California Code of Regulations Title 22* – Including other topics, Title 22 relates to the cleanup and prevention of toxins in soils and water. Sections 66261.1 through 66261.126 provide for the identification and listing of hazardous waste and criteria for identifying the characteristics of hazardous waste, sampling waste, and hazardous constituents, and the basis for listing hazardous waste. Title 22 identifies and lists hazardous wastes and standards applicable to generators and transporters of hazardous waste. It provides standards for owners and operators of hazardous waste transfer, treatment, storage, and disposal facilities. Title 22 establishes the minimum standards for acceptable management of hazardous waste. It also governs enforcement and inspections. Selection and ranking criteria for hazardous waste sites requiring remedial action are identified. And it governs site and facility cleanup services, corrective action, and site remediation.
- California Health and Safety Code – The California Health and Safety Code, Section 25356, establishes criteria for the protection of public health, safety, and the environment associated with toxic substances. DTSC enforces cleanup of contaminated sites through the implementation of Remedial Action Plans (RAPs), which are regulated by CERCLA and Section 25356.1 of the California Health and Safety Code. The program/project would be required to comply with the criteria during excavation and removal of soils to prevent mishandling.
- California Hazardous Waste Control Law – The Hazardous Waste Control Law (HWCL) is the primary hazardous waste statute in the State of California. The HWCL implements RCRA as a "cradle-to-grave" waste management system in the State of California. The HWCL specifies that generators have the primary duty to determine whether their wastes are hazardous and to ensure their proper management. The HWCL also establishes criteria for the reuse and recycling of hazardous wastes used or reused as raw materials. The HWCL exceeds federal requirements by mandating source reduction planning and a much broader requirement for permitting facilities that treat hazardous waste. HWCL applies to this program because contractors would be required to comply with its hazardous waste requirements that would ensure proper disposal of soils.
- Pursuant to CCR Title 14, Division 7, Chapter 9, Article 6.5 (Siting Elements) Section 18755, county governments are required to prepare and adopt a Countywide Siting Element (CSE) as part of their Countywide Integrated Waste Management Plan (CIWMP). The CSE "shall demonstrate that there is a countywide or region-wide minimum of 15 years of combined permitted disposal capacity, through existing or planned solid waste disposal and transformation facilities or through additional strategies."
- California Executive Order No. D-62-02 (aka Governor's Moratorium) –This order requires material from decommissioned facilities that previously handled radioactive materials to be disposed of in a RCRA Class I hazardous waste disposal facility, even when the materials of the decommissioned facility have been decontaminated and are not known to exhibit radioactive properties.

4.12.2.3 Local

Ventura County General Plan Goals and Policies

2.15.1 Goals

1. Minimize the risk of loss of life, injury, serious illness, damage to property, and economic and social dislocations resulting from the use, transport, treatment and disposal of hazardous materials and hazardous wastes.

2.15.2 Policies

1. Hazardous wastes and hazardous materials shall be managed in such a way that waste reduction through alternative technology is the first priority, followed by recycling and onsite treatment, with disposal as the last resort.

4.4.1 Goals

1. Ensure the provision of adequate individual and public sewage/ waste collection, treatment and disposal facilities to meet the County's current and future needs in a manner which will protect the natural environment and ensure protection of the public's health, safety and welfare.

4.4.2 Policies

1. Community sewage treatment facilities and solid waste disposal sites shall be deemed consistent with the General Plan only if they are designated on the Public Facilities Map. Onsite septic systems (i.e., individual sewage disposal systems), onsite wastewater treatment facilities, waste transfer stations, offsite waste treatment facilities and onsite storage facilities are consistent with the General Plan if they conform to the goals, policies and programs of the General Plan.

5. Waste treatment and disposal operations shall be designed and conducted in a manner that is compatible with surrounding land uses such that the potential impacts are mitigated to less than significant levels, or, where no feasible mitigation measures are available, a statement of overriding considerations consistent with CEQA shall be adopted. At the end of such operations, the site shall be restored to a use compatible with surrounding land uses.

4.12.3 Thresholds of Significance

For the purposes of this PEIR, DTSC has used the checklist questions in Appendix G of the CEQA Guidelines as thresholds of significance to determine whether the project would have a significant environmental impact regarding utilities and service systems. Based on the size and scope of the project and the potential for impacts, the criteria identified below are included for evaluation in this PEIR. Please see Chapter 7.0, *Impacts Found Not to Be Significant*, of this PEIR, for a discussion of other issues associated with the evaluation of utilities where the characteristics of the project made it clear that effects would not be significant and further evaluation in this section was not warranted.

Would the project:

4.12-1 Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs (refer to Impact Statements 4.12-1a and 4.12-1b)?

4.12-2 Comply with federal, state, and local statutes and regulations related to solid waste (refer to Impact Statements 4.12-2a and 4.12-2b)?

4.12.4 Methodology

This impact section assesses potential impacts related to solid waste disposal based on the potential for the project to be served by facilities with sufficient permitted capacity to accommodate waste to be generated by the project. The available capacities for individual types of waste were obtained by using data provided by the facilities to be used for disposal of project materials and available data from the CalRecycle database. In addition, solid waste impacts are analyzed in the context of existing solid waste regulations and policies.

Project implementation would include the excavation of soil, demolition and removal of facilities, and installation and operation of soil and groundwater treatment systems (e.g., soil vapor extraction systems, biotreatment systems, extraction wells, groundwater treatment systems). These activities would represent relatively short-term events, although they would occur at various times throughout the 15-year project schedule. These activities include post-cleanup monitoring activities to verify that remedial objectives have been achieved.

4.12.5 Analysis of Project Impacts

The following text describes the potential environmental impacts related to utilities and service systems associated with implementing the overall site cleanup versus initial activities, demarcated as impacts "a" and "b," respectively. As presented in Section 3.7 of this PEIR, the initial activities include eight different projects. Depending on the degree to which impacts of the initial projects would be similar to or different from each other, the impact analysis for the initial projects for some thresholds has been combined accordingly (i.e., the number of separate discussions for impacts for each threshold range from one to eight). Following each potential impact is a significance determination for each potential impact.

4.12.5.1. Landfill Capacity

Program Assessment

Impact 4.12-1a: Would implementation of the **overall site cleanup** be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Overall Site Cleanup (Impact 4.12-1a)

Overall cleanup would result in excavation and offsite disposal of approximately 2,520,000[1] CY of soil (non-hazardous, hazardous, and radiological/mixed) and approximately 30,000 CY of

[1] All volumes in CY for in situ soil.

building debris. The schedule to complete soil cleanup, excavation, and disposal would be approximately 15 years beginning in 2018.

Table 4.12-1 lists the facilities considered for disposal of soil, sediments, and debris removed from the project site. One or more disposal facilities for non-hazardous waste, hazardous waste, and LLRW would be used due to the anticipated volume of soil designated for offsite disposal. **Table 4.12-2** shows the distribution of soil disposal for each waste type. A total of 1,580,000 CY of non-hazardous soil (Class III), 808,000 CY of hazardous soil, 117,000 CY of soil exceeding presumptive Rad LUT and 17,000 CY of radiological/mixed soil generated by the project would be sent to any of the facilities listed in Table 4.12-2. As shown in Table 4.12-2, together these facilities have adequate permitted capacity to serve the project's generation of waste over 15 years.

> Conclusion: The facilities identified for disposal of waste generated from the overall site cleanup would have sufficient permitted capacity; therefore, impacts related to landfill capacity would be less than significant.

Impact 4.12-1a Determination: *The **overall site cleanup** would be served by landfills with sufficient permitted capacity, and the impact would be **less than significant.***

Initial Project Assessment

Impact 4.12-1b: Would implementation of the **initial activities** be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Initial Activities (Impact 4.12-1b)

DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal (Impact 4.12-1b)

As shown in Section 3.7of this PEIR, DOE's initial activities involves removal and disposal of approximately 91,000 CY of soil within Area IV that contains radionuclides above LUT values, 314,000 CY of soil with radionuclides below LUT values, and approximately 209,000 CY of chemically contaminated soil.

Radiologically impacted soil would be transported to a permitted radioactive materials disposal facility such as the NNSS facility in Nevada. Soil with chemical-only contamination (radionuclides at background or below) would be transported to either an RCRA Class 1 hazardous waste disposal facility or a Class 2 or Subtitle D–compliant Class 3 non-hazardous disposal facility based on characterization results. Final selection of facilities to accept the chemically contaminated soil would be evaluated as part of the cleanup decision documents.

The total combined permitted remaining capacities for radioactive materials disposal facilities is more than 9,000,000 CY (as shown in Table 4.12-3). The disposal of 91,000 CY of soil would represent less than 1 percent of the combined permitted remaining capacities, and the project would not exceed or significantly reduce the available landfill capacities.

TABLE 4.12-2
SOIL WASTE DISTRIBUTION

Type of Waste	Total Volume (CY)	Facilities	Permitted Remaining Capacity (CY)
Non-hazardous	1,580,000	Antelope Valley	20,400,000
		Azusa Land Reclamation	51,500,000
		Chiquita Canyon Landfill	8,620,000
		Clean Harbors Buttonwillow	500,000
		Clean Harbors Deer Trail	No maximum reported at this time
		Clean Harbors Deer Park	268,000
		Kettleman Hills Facility	4,900,000
		La Paz County Landfill	Not available at this time
		Lancaster Landfill and Recycling Center	11,200,000
		McKittrick Waste Treatment Site	770,000
		Mesquite Regional Landfill	1.1 billion tons which is equivalent to approximately 733,000,000 CY at 1.5 tons per CY waste density
		Simi Valley Landfill	120,000,000
		US Ecology Beatty	580,000
		US Ecology Grand View	10,800,000
Hazardous	808,000	Clean Harbors Buttonwillow	500,000
		Clean Harbors Deer Trail	No maximum reported at this time
		Clean Harbors Deer Park	268,000
		Clean Harbors Grassy Mountain	• RCRA landfill capacity: 711,000 • TSCA landfill capacity: 774,000
		Clean Harbors Westmorland	No maximum reported at this time; Available capacity until 2100
		Kettleman Hills	4,900,000
		La Paz County Landfill	Not available at this time
		Soil Safe	307,000
		US Ecology Beatty	580,000
		US Ecology Grand View	10,800,000
Radiological	134,000	Energy Solutions	8,000,000
		Nevada National Security Site	1,800,000

As shown in **Table 4.12-3**, the total combined permitted remaining capacities for Class I and Class II facilities identified for use for DOE's initial project is more than 18,800,000 CY.

TABLE 4.12-3
DOE INITIAL ACTIVITIES SOIL WASTE DISTRIBUTION

Type of Waste	Total Volume (CY)	Permitted Remaining Capacity (CY)	Percentage of Available Capacity
Radiological	91,000	9,800,000	< 1%
Hazardous	209,000	18,800,000	< 2%

The disposal of 209,000 CY of chemically contaminated soil would represent less than 2 percent of the combined permitted remaining capacities, and the project would not exceed or significantly reduce the available landfill capacity.

> Conclusion: The facilities identified for disposal of waste from DOE's initial project have sufficient permitted capacity to accommodate the project's solid waste disposal needs; therefore, impacts would be less than significant.

NASA Liquid Oxygen Plant (Impact 4.12-1b)

NASA proposes to implement the excavation and disposal of up to 73,500 CY of in situ soil (58,800 CY of hazardous soil and 14,700 CY of non-hazardous soil) for disposal at offsite permitted disposal facilities. The contaminated soil would be transported in covered transport containers (roll-off bins, dump trucks) to an approved waste facility. The specific disposal facilities that would be used for this effort would be identified during the final planning stages of the cleanup. As shown in Table 3-10 of this PEIR, potential disposal facilities for an estimated in situ volume of 58,800 CY of hazardous soil include La Paz County Landfill and US Ecology Beatty. The total remaining permitted capacity of the facilities accepting hazardous soil identified by NASA for use for the Liquid Oxygen Plant project is 580,000 CY.[2] The initial project's disposal of 58,800 CY of hazardous soil would represent about 10 percent of the remaining capacity. Therefore, the project would not exceed or substantially reduce the available landfill capacities.

Potential disposal facilities for an estimated in situ volume of approximately 14,700 CY of non-hazardous soil would be: Chiquita Canyon Landfill, Azusa Land Reclamation, US Ecology Beatty, La Paz County Landfill, and Simi Valley Landfill and Recycling Center. The total remaining capacities of the facilities accepting non-hazardous soil identified by NASA for disposal of soil from the Liquid Oxygen Plant project is 150,000,000 CY.[3]

[2] Remaining capacity data is not available for La Paz County Landfill. Therefore, the remaining capacity for US Ecology Beatty was used for this calculation.

[3] Remaining capacity data is not available for La Paz County Landfill. Therefore, the remaining capacities for Chiquita Canyon Landfill, Azusa Land Reclamation, US Ecology Beatty, Simi Valley Landfill and Recycling Center were used for this calculation.

As shown on **Table 4.12-4**, the disposal of approximately 14,700 CY of non-hazardous soil would represent less than 1 percent of the remaining capacity. Therefore, the project would not exceed or significantly reduce the available landfill capacities.

TABLE 4.12-4
NASA INITIAL ACTIVITIES SOIL WASTE DISTRIBUTION

Type of Waste	Total Volume (CY)	Permitted Remaining Capacity (CY)	Percentage of Available Capacity
Hazardous	58,800	580,000 [A]	10%
Non-Hazardous	14,700	150,000,000	< 1%

A. This number is derived by adding the permitted remaining capacities for facilities accepting hazardous waste shown in Table 4.12-2. Remaining capacity data is not available for La Paz County Landfill. Therefore, the remaining capacity for US Ecology Beatty was used for this calculation.

Conclusion: The facilities identified for disposal of waste from NASA's initial project have sufficient permitted capacity to accommodate the project's solid waste disposal needs; therefore, impacts would be less than significant.

DOE Building Demolition Activities (Impact 4.12-1b)

DOE proposes to completely remove its remaining 19 remnant buildings and features in Area IV, as described in Section 3.7.3.1, *DOE Building Demolition Activities*, and shown in Figure 3-13. Seven are sheds used for material storage; six are larger, non-DTSC-permitted structures; one is a building slab; and the remaining five are the RCRA-permitted structures within the RMHF and HWMF, discussed in subsequent sections.

The volume of waste to be disposed of at LLRW disposal facilities is estimated at about 5,480 CY, as detailed in Table 3-11. DOE would dispose of the materials from both permitted and non-DTSC-permitted structures that handled radioactive materials to LLRW facilities, regardless of the waste characteristics or waste classification presented in Table 3-11, due to the history of these particular facilities and in compliance with California Executive Order No. D-62-02.

As listed in Table 3-12, some materials from structures that were never authorized to handle radioactive materials, and did not handle such materials, would be disposed of or recycled at non-radioactive waste facilities. About 1,244 CY of waste would be disposed of at RCRA-permitted Class I disposal facilities, 1,220 CY would be disposed of at RCRA permitted Class III disposal facilities, 41.3 CY of materials would be disposed of at waste facilities that accept asbestos-containing materials, and 3,540 CY of steel, asphalt, and concrete would be recycled.

The NNSS facility in Nevada has been identified as the preferred disposal facility for LLRW debris. The Energy Solutions facility in Utah and US Ecology in Idaho may be used if necessary and would be retained as backup options. The specific disposal facilities would be identified at the time of demolition. Selection criteria of facilities to accept the debris would be evaluated as part of the building-specific demolition work plan development. Approval of the disposal

facilities for radioactive and mixed waste would be under the authority of DOE and per the specific facility accepting the waste. The total combined, permitted, remaining capacities for radioactive waste at the disposal facilities identified above is more than 20,600,000 CY (see **Table 4.12-5**). DOE's disposal of 5,480 CY of building materials would represent less than 1 percent of the combined permitted remaining capacities, and would not exceed or significantly reduce the available landfill capacities. The total combined remaining capacities of each facility would be sufficient to serve the initial project.

TABLE 4.12-5
DOE BUILDING DEMOLITION ACTIVITIES SOLID WASTE DISTRIBUTION

Solid Waste Facility	Total Volume (CY)	Permitted Remaining Capacity (CY) (rounded) [a]	Percentage of Available Capacity
LLRW			
NNSS	-	1,800,000	-
Energy Solutions	-	8,000,000	-
US Ecology, Grand View, Idaho	-	10,800,000	-
Total LLRW	**5,480** [b]	**20,600,000**	**<1%**
Hazardous Waste			
Clean Harbors Buttonwillow	-	500,000	-
Clean Harbors Westmorland	-	No maximum at this time; Available capacity till 2100	-
Total Hazardous	**1,244**	**>500,000**	**<1%**
Non-Hazardous Waste			
Chiquita Canyon	-	8,620,000	-
Antelope Valley	-	20,400,000	-
Clean Harbors Buttonwillow	-	500,000	-
Clean Harbors Westmorland	-	No maximum at this time; Available capacity till 2100	-
Total Hazardous	**41**	**29,500,000**	**<1%**

Notes:
[a] See the sources listed at the end of Table 4.12-1 for the permitted remaining landfill capacities
[b] The NNSS facility in Nevada has been identified as the preferred disposal facility for LLRW debris. The Energy Solutions facility in Utah and US Ecology in Idaho may be used if necessary and would be retained as backup options.

DOE anticipates that hazardous waste would be disposed of at the Clean Harbors, Buttonwillow facility or the DOE may direct some hazardous waste to the Clean Harbors, Westmoreland Class I facility if necessary due to facility logistics at the time of disposal. The total combined remaining capacity of these landfills is over 500,000 CY. Disposal of 1,240 CY of building debris would represent less than 1 percent of the combined remaining capacity, and the project would not exceed or significantly reduce the available landfill capacity.

DOE is considering several facilities for disposal of non-hazardous waste because of possible uncertainties for acceptance from SSFL based on the Governor's Moratorium. Potential facilities (with the most likely facility listed first) include two California Class III sites (Chiquita Canyon and Antelope Valley) and two California Class I sites (Buttonwillow and Westmorland). The combined remaining capacity at the two Class III facilities is 29,000,000 CY. The combined remaining capacity at Class I landfills would be available beyond the year 2100. Disposal of 41 CY of debris to a Class I facility would not exceed or significantly reduce the available landfill capacity.

About 3,540 CY of steel, asphalt, and concrete would be recycled. Three facilities are being considered for disposal of non-hazardous recyclable material: Kramer Metals, Standard Industries, and Gillibrand. The project would be adequately served by a combination of these facilities.

> Conclusion: The facilities identified for disposal of waste from DOE's demolition activities project have sufficient permitted capacity to accommodate the project's solid waste disposal needs; therefore, impacts would be less than significant.

RCRA Post-Closure and Hazardous Waste Facility Closure

This discussion addresses the five closure projects described in Section 3.7.4, *RCRA Post-Closure and Hazardous Waste Facility Closure*:

- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

DTSC would evaluate the renewal of two post-closure permits and regulate the closure of three former hazardous waste facilities, all of which are currently non-operational, under the RCRA Hazardous Waste Facility Permitting Program. Closure is analogous to cleanup, and post-closure is analogous to the operations, monitoring, and maintenance that may be required after cleanup actions are completed to ensure and confirm that the chosen remedy continues to protect human health and the environment. The specific anticipated activities for each RCRA permitted unit are described below.

Thermal Treatment Facility Closure (Impact 4.12-1b)

The TTF is located in Area I, as shown in Figure 3-10, and consists of a concrete pad and Burn Pit 2. The TTF closure project would include additional sampling, excavation and disposal of about 300 in situ CY of soil and concrete debris at an offsite RCRA permitted disposal facility, followed by confirmation sampling and restoration. Waste characterization sampling of soil excavated as part of this project would be conducted prior to disposal activities. Excavated soil determined to meet hazardous waste criteria may be disposed of at the following locations: Clean Harbors, Buttonwillow, California; Chemical Waste Management, Kettleman Hills, California;

US Ecology; or Clean Harbors, Deer Trail, Colorado. Soil determined to be non-hazardous may be sent to Antelope Valley or McKittrick Landfills for disposal.

The total combined permitted remaining capacity for hazardous and non-hazardous waste facilities identified for use for the TTF Closure project is more than 25,000,000 CY as shown in **Table 4.12-6**. The project's disposal of 300 CY of soil would represent less than 1 percent of the combined permitted remaining capacities. The initial project would not exceed or significantly reduce the available landfill capacity.

TABLE 4.12-6
THERMAL TREATMENT FACILITY CLOSURE SOLID WASTE DISTRIBUTION

Solid Waste Facility	Total Volume (CY)	Permitted Remaining Capacity (CY) [a]	Percentage of Available Capacity
Hazardous Waste			
Clean Harbors Buttonwillow	-	500,000	-
Chemical Waste Management, Kettleman Hills		4,900,000	-
US Ecology Beatty		580,000	
Clean Harbors Westmorland	-	No maximum at this time; Available capacity till 2100	-
Deer Harbors		No maximum reported at this time. Will permit into 2100.	
Total Hazardous	**300**	**5,980,000**	**<1**
Non-Hazardous Waste			
Antelope Valley	-	20,400,000	-
McKittrick Waste Treatment Site	-	770,000	-
Total Non-Hazardous	**300**	**21,200,000**	**<1**

Notes:
[a] See the sources listed at the end of Table 4.12-1 for the permitted remaining landfill capacities.

Conclusion: The facilities identified for disposal of waste from the TTF project have sufficient permitted capacity to accommodate the project's solid waste disposal needs. Therefore, impacts would be less than significant.

Radioactive Materials Handling Facility Closure (Impact 4.12-1b)

The RMHF is located within Area IV and includes 11 buildings and structures, along with paved areas. DOE's initial project would be limited to the removal of Buildings 4021, 4022, and 4621 and Mixed Waste Storage Yard, as shown in Figure 3-13. DOE would prepare a closure plan for DTSC review and approval that would describe demolition and disposal activities. All building materials from the RMHF would be disposed at an offsite permitted radioactive materials disposal facility because the RMHF was previously used as a radiological and mixed waste treatment and storage facility. As listed on Table 3-13, 2,388 CY of building debris consisting of concrete, steel, and other building materials would be disposed of at NNSS, a LLRW disposal facility.

The total combined permitted remaining capacities for radioactive materials disposal facilities is more than 9,000,000 CY. Disposal of 2,388 CY of building materials would represent less than one percent of the combined permitted remaining capacities, and the project would not exceed or significantly reduce the available landfill capacities.

> Conclusion: The RMHF closure would be served by a landfill with sufficient permitted capacity to accommodate the radioactive materials, and the impact would be less than significant.

Hazardous Waste Management Facility (HWMF) Closure (Impact 4.12-1b)

The HWMF is located within Area IV and includes Buildings 4029 and 4133, as shown on Figure 3-13. All building materials from the HWMF would be disposed of at offsite RCRA permitted disposal or recycling facilities, depending on the waste characteristics. No radioactive materials were ever handled in the HWMF. As shown in Table 3-14, about one CY of hazardous waste would be disposed of at Clean Harbors Buttonwillow, an RCRA-permitted Class I disposal facility; 144 CY of concrete debris and 52 CY of steel debris would be disposed of at Clean Harbors Buttonwillow and/or Standard Industries for non-hazardous materials; and 0.4 CY of ACM building materials would be disposed of at Clean Harbors Buttonwillow. As discussed previously, each of these facilities would have adequate permitted capacity to serve the initial project over the duration of the project.

> Conclusion: The HWMF closure would be served by permitted solid waste and recycling facilities with sufficient permitted capacity to accommodate the initial project's disposal needs, and the impact would be less than significant.

Areas I, II, and III Impoundment Post-Closure (Impact 4.12-1b)

Five historical surface impoundments in Areas I and III and four historical surface impoundments in Area II were closed under the RCRA permitting program in the 1980s. These closure activities included excavation and offsite disposal of the residual wastes, liquids, sediments, liner, and underlying contaminated soil. Some underlying contaminated material remains in the bedrock, and the groundwater has been contaminated from past releases from the surface impoundments.

The activities associated with the impoundment permits are limited to managing the existing impoundments through monitoring and periodic maintenance. Boeing (Areas I and III) and NASA (Area II) would prepare Post-Closure Monitoring Plans for review and approval by DTSC. The primary maintenance activities would include ongoing maintenance of the surface impoundment caps, surface water diversion structures, and monitoring well network used to evaluate ongoing groundwater conditions. Implementation of these post-closure activities would not generate solid waste for offsite disposal, and there would be no impact to landfill capacity.

> Conclusion: The Areas I, II, and III Impoundment Post-Closure projects would not generate solid waste for offsite disposal; therefore, no impacts to landfills would occur.

Impact 4.12-1b Determination: *The **initial activities** would be served by a landfill with sufficient permitted capacity, and the impact would be **less than significant.***

4.12.5.2. Solid Waste

Program Assessment

Impact 4.12-2a: Would the **overall site cleanup** comply with federal, state, and local statutes and regulations related to solid waste?

Overall Site Cleanup (Impact 4.12-2a)

The overall site cleanup would generate an estimated 2,523,000 CY[4] of soil (non-hazardous, hazardous, and radiological/mixed) to be excavated and disposed offsite. Much of the soil identified for excavation and removal contains multiple contaminants of concern. The estimated maximum daily amount of 2,208[5] tons per day of soil would be hauled offsite by truck to an appropriately permitted solid waste facility. As shown in Table 4.12-1, the daily amount of soil to be disposed of per day would not exceed the maximum permitted throughput (tons per day) for each waste type (i.e., non-hazardous, hazardous, and radiological/mixed). It is possible that soil disposal for one day could consist of one type (non-hazardous, hazardous, and radiological). Based on this scenario, there would be adequate maximum permitted daily throughput for each category. The overall site cleanup would be in compliance with all federal, State, and local statues related to solid waste disposal. Therefore, impacts would be less than significant.

> Conclusion: The overall site cleanup's waste stream would not exceed the available permitted capacity and permitted daily throughput of relevant landfills. Therefore, the project would comply with all federal, state, and local statues related to solid waste disposal, and impacts would be less than significant.

Impact 4.12-2a Determination: *The **overall site cleanup** would comply with federal, state, and local statutes and regulations related to solid waste. This impact would be **less than significant.***

Initial Project Assessment

Impact 4.12-2b: Would the **initial activities** could comply with federal, state, and local statutes and regulations related to solid waste?

[4] All volumes in CY for in situ soil.
[5] 96 trucks multiplied by 23 tons per truck load.

Initial Activities (Impact 4.12-2b)

As discussed in Section 3.7, *Initial Activities*, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

As discussed previously under Impact Statement 4.12-2a, the disposal facilities to which material would be transported from the project site would be dependent on soil characterization of contaminated soil to be removed from the site. Soil would be examined and/or profiled before leaving the site to ensure it is suitable for disposal at the designated facility. The maximum amount of soil to be disposed of per day would be 2,208 tons (based on the maximum 96 trucks per day). Maximum permitted daily throughputs (tons per day) for each type of solid waste disposal facility would be sufficient to accept this volume of soil generated by the initial projects. Therefore, initial activities would be in compliance with all federal, State and local statutes related to solid waste disposal and would result in less than significant impacts.

> Conclusion: The initial activities would comply with federal, state, and local statutes and regulations related to solid waste. Therefore, impacts would be less than significant.

Impact 4.12-2b Determination: *The* ***initial activities*** *would comply with federal, state, and local statutes and regulations related to solid waste. This impact would be* ***less than significant.***

4.12.6 Mitigation Measures

No mitigation measures are required.

4.12.7 Impact Summary

Table 4.12-7 summarizes the project's impacts and significance determinations related to solid waste.

TABLE 4.12-7
SUMMARY OF IMPACTS – SOLID WASTE

Impact	Overall Project	DOE Initial Project	NASA Initial Project	DOE Demolition Activities	RCRA Post-Closure Facility Closure	Mitigation Measures
Impact 4.12-1a: Permitted capacity	LTS	—	—	—	—	None
Impact 4.12-1b: Permitted capacity	—	LTS	LTS	LTS	LTS	None
Impact 4.12-2a: Compliance with federal, state and local statutes and regulations	LTS	—	—	—	—	None
Impact 4.12-2b: Compliance with federal, state and local statutes and regulations	—	LTS	LTS	LTS	LTS	None

LTS = Less than significant

4.13 Energy Consumption

This section evaluates the energy consumption impacts that may result from implementation of the overall site cleanup and the initial activities. The existing setting with respect to energy consumption is described, along with the relevant regulatory background. Project impacts and mitigation measures, as necessary, are presented.

To ensure that energy implications are considered in project decisions, CEQA requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. This section has been prepared pursuant to the energy conservation analysis guidelines established in Appendix F of the CEQA Guidelines.

4.13.1 Environmental Setting

4.13.1.1 Petroleum

According to the U.S. Energy Information Administration's (USEIA's) International Energy Outlook 2016, the global supply of crude oil, other liquid hydrocarbons, and biofuels is expected to be adequate to meet the world's demand for liquid fuels through 2040. Fueling stations throughout the project region are used to provide gasoline and diesel for current operations. These fueling stations receive gasoline and diesel fuel supplies from refineries located throughout California. Approximately 36 percent of California's petroleum supply comes from in-state sources while 52 percent is imported from foreign sources, and 12 percent is imported from Alaska (CEC, 2016a). Crude oil is moved throughout California through a network of pipelines that carry it from both on-shore and off-shore oil wells to refineries located in the San Francisco Bay area, Los Angeles area, and the Central Valley (USEIA, 2016a). Currently, 17 petroleum refineries operate in California (USEIA, 2016a).

Most crude oil produced in California is refined within California to meet state-specific formulations required by the CARB. The major categories of petroleum fuels are gasoline and diesel for passenger vehicles, transit, rail vehicles, and construction equipment and fuel oil for industry and electrical power generation.

In 2014, California consumed approximately 629.5 million barrels (26.4 billion gallons) of petroleum (USEIA, 2016a). As of December 31, 2015, California has 2,845 million barrels of crude oil left in the state's reserves (USEIA, 2016a).

Current operations onsite include monitoring and maintenance activities and ongoing environmental surveys and studies. Each of the RPs has workers or contractors accessing the site daily. Boeing has a total of 30 employees and contractors, DOE has 2 employees, and NASA has 5 employees and/or contractors (Boeing, 2015) (DOE, 2016) (NASA, 2016). These employees and contractors together consume an estimated 29,900 gallons of gasoline per year as a result of commuting to and from the project site (ESA, 2017e). There are no other fuel-consuming activities that currently take place at the project site.

4.13.1.2 Electricity

Electrical services are provided to the project site by Southern California Edison (SCE). SCE provides electricity to approximately 15 million people, 180 incorporated cities, 15 counties, 5,000 large businesses, and 280,000 small businesses throughout its 50,000-square-mile service area (SCE, 2016a). SCE produces and purchases its energy from a mix of conventional and renewable generating sources. **Table 4.13-1** shows the electric power mix that was delivered to SCE's retail customers in 2014 compared to the statewide power mix.

TABLE 4.13-1
ELECTRIC POWER MIX DELIVERED TO SCE RETAIL CUSTOMERS IN 2014

Energy Resources	2014 SCE Power Mix	2013 CA Power Mix [A]
Eligible Renewable		
-- Biomass & waste	1%	3%
-- Geothermal	9%	4%
-- Small hydroelectric	0%	1%
-- Solar	4%	2%
-- Wind	10%	9%
Coal	0%	8%
Large Hydroelectric Natural Gas	3%	8%
Natural Gas	27%	44%
Nuclear	6%	9%
Other	0%	0%
Unspecified sources of power [B]	40%	12%
TOTAL	**100%**	**100%**

[A] Percentages are estimated annually by the California Energy Commission based on the electricity sold to California consumers during the previous year.
[B] "Unspecified sources of power" means electricity from transactions that are not traceable to specific generation sources.

SOURCE CEC, 2014a.

SCE monitors and maintains a vast electricity system. To ensure energy availability and reliability for existing and future consumers, SCE engages in ongoing planning efforts that involve power use projections, system upgrades, and changes to their power mix (SCE, 2016a).

SCE establishes Time-of-Use (TOU) periods to define peak electricity demand during the summer and winter periods. The summer period is defined as June through September. The winter period is defined as October through May. SCE has established three demand periods: Off-Peak, Mid-Peak, and On-Peak. Off-Peak is the period of lowest energy demand; Mid-Peak is the period of moderate energy demand; and On-Peak is the period of highest energy demand. **Table 4.13-2** shows the associated period of time for each demand period.

TABLE 4.13-2
SCE ENERGY DEMAND PERIODS

Demand Periods	Summer TOU Periods [a]	Winter TOU Periods [a]
Off-Peak	11 p.m.–8 a.m.	9 p.m.–8 a.m.
Mid-Peak	8 a.m.–12 p.m. & 6 p.m.–11 p.m.	8 a.m.–9 p.m.
On-Peak	12 p.m.–6 p.m.	N/A

a. Weekends and holidays are Off-Peak all day

SOURCE: SCE, 2016b.

Electricity is currently used onsite to power existing field office buildings, periodic GETS testing, and surface water treatment systems. It is estimated that approximately 118,000 kilowatt hours (kWh) per month are currently consumed at the project site (SCE, 2013). The surface water treatment systems are operated continuously as needed at any time of day. The office buildings are operated primarily during business hours, approximately 7:00 a.m. to 7:00 p.m., Monday through Friday. Therefore, current electricity demand at SSFL occurs throughout the summer Mid-Peak and On-Peak periods and winter Mid-Peak period.

4.13.1.3 Natural Gas

The proposed project is located within the service area for Southern California Gas Company (SoCalGas) service area, which encompasses approximately 20,000 square miles throughout central and southern California, from Visalia to the Mexican border (SoCalGas, 2016a).

Natural gas use at the project site has been limited in recent years. Based on a SoCalGas bill for May 2013, approximately 12 therms of natural gas was used at SSFL on a monthly basis. On June 17, 2016, natural gas service at SSFL ended (Boeing, 2016). Thus, natural gas is currently not used for onsite operations at the project site.

4.13.2 Regulatory Setting

4.13.2.1 State

California Senate Bill 350

California SB 350 is the most recent update to the state's Renewables Portfolio Standard (RPS) requirements, and requires publicly owned utilities and retail sellers of electricity in California to procure 33 percent of their electricity sales from eligible renewable sources by 2020, and 50 percent by the end of 2030.

California Energy Code

Title 24, Part 6, of the CCR is the California Energy Code, a section of the CBC that includes standards mandating energy conservation measures in new construction for heating, cooling, ventilation, water heating, and lighting. Since its establishment in 1977, these standards (along with standards for energy efficiency in appliances) have contributed to a reduction in electricity

and natural gas usage and costs in California. The California Energy Commission produces—and the California Building Standards Commission subsequently adopts—updates to these standards every 3 years to incorporate new energy efficiency technologies. The CBC is implemented through the local planning and permit process.

4.13.2.2 Local

Ventura County General Plan

The Ventura County General Plan contains goals and policies for the consumption of energy resources. The following energy resources goals and policies are applicable to the project.

Energy Resources Goals

1.9.1.1 Promote land use patterns which minimize energy consumption.

1.9.1.2 Encourage the use of renewable sources of energy and energy conservation techniques in new development.

1.9.1.3 Encourage retrofit programs for energy conservation.

1.9.1.4 Encourage increased fuel efficiency of vehicles and decreased number and length of vehicle trips.

Energy Resources Policies

1.9.2.1 Discretionary development shall be evaluated for impact to energy resources and utilization of energy conservation techniques.

4.13.3 Thresholds of Significance

For the purposes of this analysis, DTSC has developed thresholds of significance based on the recommended EIR contents provided in Appendix F of the CEQA Guidelines. Appendix F of the CEQA Guidelines provides guidance on energy conservation analyses for EIRs. The thresholds of significance were developed to determine whether the project would have a significant environmental impact regarding energy conservation.

In accordance with Appendix F of the CEQA Guidelines, the following list of energy impact possibilities are recommended EIR contents:

1. The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal. If appropriate, the energy intensiveness of materials may be discussed.
2. The effects of the project on local and regional energy supplies and on requirements for additional capacity.
3. The effects of the project on peak and base period demands for electricity and other forms of energy.
4. The degree to which the project complies with existing energy standards.
5. The effects of the project on energy resources.

6. The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

Based on these recommended contents, the following thresholds of significance were developed by DTSC.

Would the project:

4.13-1 Use energy efficiently (refer to Impact Statements 4.13-1a and 4.13-1b)?

4.13-2 Increase transportation energy use requirements (refer to Impact Statements 4.13-3a and 4.13-2b)?

4.13-3 Increase demand on local and regional energy supplies (including peak and base period demands) that result in the need for additional capacity (refer to Impact Statements 4.13-2a and 4.13-2b)?

4.13-4 Comply with existing energy standards, policies and regulations (refer to Impact Statements 4.13-3a and 4.13-3b)?

4.13.4 Methodology

Quantitative thresholds of significance have not been established for the assessment of petroleum, electricity, or natural gas consumption impacts. Nonetheless, the consumption of transportation fuels (petroleum), electricity, and natural gas can be calculated and disclosed.

Proposed petroleum use for soil and groundwater cleanup was calculated using the estimated traffic trip generation rates associated with trucks, worker and visitor vehicles and onsite off-road remediation equipment, and fuel emission factors provided by the USEIA (USEIA, 2016b).

The overall site cleanup proposes to use SVE and other cleanup technologies that have the potential to consume significant quantities of electricity due to the use of blowers, vacuums, pumps, and/or other equipment. At the time of this analysis, project-specific system engineering designs for these technologies are not proposed. Consequently, a specified wattage for these systems is not available. This analysis presents the best available public data for cleanup systems that use similar pieces of electricity-consuming equipment as those described for the identified electricity-consuming remediation technologies.

Because the initial activities would solely rely on excavation and demolition for cleanup, it is assumed that the initial activities would rely mainly on gasoline or diesel, and electricity use would be comparable to existing electricity demand at the project site.

The use of natural gas is not proposed for either the overall site cleanup or initial activities, nor is natural gas service currently provided at the project site. Therefore, it is assumed that the project would not consume natural gas.

The project's energy efficiency was analyzed by quantifying the project's petroleum and electricity, and then confirming whether energy-efficient practices are proposed as an inherent

part of the project. An evaluation was then made to determine whether the project proposes to use energy efficiently.

To determine whether the project would increase demand on energy supplies that result in the need for additional capacity, the project's estimated petroleum, electricity, and natural gas use was quantified and then analyzed against existing available energy supplies.

Lastly, the project was reviewed to determine if proposed activities would conflict with applicable energy standards, policies, and regulations.

4.13.5 Analysis of Project Impacts

The following text describes the potential environmental impacts related to energy associated with implementing the overall site cleanup versus initial activities, demarcated as impact "a" and "b" respectively. As presented in Section 3.7 of this PEIR, the initial activities include eight different projects. Depending on the degree to which impacts of the initial activities would be similar to or different from each other, the impact analysis for the initial activities for some thresholds has been combined accordingly (i.e., the number of separate discussion for impact for each threshold ranges from one to eight). Following each potential impact is a significance determination.

4.13.5.1 Energy Efficiency

Program Assessment

Impact 4.13-1a: Would the **overall site cleanup** result in the inefficient use of energy resources?

Overall Site Cleanup (Impact 4.13-1a)

Petroleum

The overall site cleanup would result in the consumption of significant quantities of petroleum associated with the use of gasoline or diesel-powered trucks, worker vehicles, excavation/construction equipment and water trucks that would be used during soil and groundwater cleanup activities. **Table 4.13-3** presents the estimated maximum petroleum use for the overall site cleanup assuming that an average of 80 trucks[1] would be used daily, 250 workers would commute to the project site daily, and the project would conservatively rely on excavation alone for soil cleanup.

[1] An average of 80 trucks per day was used for overall projects because the level of activity for the overall projects is not anticipated to sustain 96 trucks per day over an entire year. The 80 trucks per day is an average daily activity level assumed over a peak year of activity.

TABLE 4.13-3
OVERALL SITE CLEANUP ESTIMATED PETROLEUM USE

Overall Site Cleanup Phase	Diesel (gallons/ year)	Gasoline (gallons/year)	Diesel/Gasoline Combined Total (gallons/year)	Diesel/Gasoline Combined Total to Complete Phase (gallons)
Cleanup Activities (Excavation and Offsite Disposal)	1,360,000	177,000	1,530,000	18,400,000[a]
Post-Cleanup Monitoring and Maintenance Activities	0	79,800	79,800	2,390,000 [b]

[a]. If the overall site cleanup were to rely on an average of 80 truck trips per day, the excavation and offsite disposal cleanup activities would be completed in 12 years. Therefore, this total presents the total petroleum use over 12 years.

[b]. This total presents the total petroleum use over 30 years.
Source: ESA, 2017e.

This presents the most conservative estimate because relying on excavation and offsite disposal alone would result in the greatest use of petroleum-consuming construction and transportation equipment and vehicles. As shown in Table 4.13-3, overall site cleanup activities would consume a total of 18,400,000 gallons of petroleum fuels and post-cleanup monitoring and maintenance activities would consume a total of 2,390,000 gallons of petroleum fuels.

Although implementation of the overall site cleanup would result in the consumption of petroleum, the proposed project includes mitigation measures to increase efficiency of fuel usage. Implementation of Mitigation Measures AQ-1 and GHG-2 require the use of more fuel-efficient vehicles; Mitigation Measures AQ-5 and TRANS-1 would restrict vehicle idling, which would reduce fuel usage; and Mitigation Measure GHG-1 requires the reuse of non-hazardous debris (such as crushed concrete), which would reduce the number of truck trips. In addition, Mitigation Measure GHG-3 prescribes a Greenhouse Gas Emissions Reduction plan that requires the reduction and offset of project-related GHG emissions generated by fuel combustion sources. Implementation of these mitigation measures would reduce the inefficient use of petroleum fuel for the duration of the project. Therefore, this impact would be less than significant.

Electricity

Electricity usage for the overall site cleanup would result from ongoing use of field office buildings and surface water treatment systems, full operation of the GETS, and the potential use of other cleanup technologies, such as SVE, bioventing, gaseous electron donor injection, and thermal desorption. During proposed cleanup activities, it is anticipated that the monthly quantity of electricity consumed by the ongoing use of office buildings and surface water treatment systems would remain approximately the same as existing conditions (i.e., 118,000 kWh per month). This is because the office buildings and surface water treatment systems would continue to operate at approximately the same level of intensity. However, full operation of the GETS would occur during cleanup activities, which has the potential to demand a substantial quantity of energy needed to operate the associated pumps. While cleanup activities would primarily involve excavation and demolition, which would rely on the use of diesel fuel for power, the project has

the potential to also use other cleanup technologies that could consume substantial quantities of electricity due to the use electricity-consuming equipment. Other cleanup technologies include:

- SVE/air sparging: This cleanup technology involves the use of blowers/vacuums to extract vapor from soil and groundwater.
- Bioventing: This cleanup technology involves the injection of air (or other gases for perchlorate) into the subsurface to enhance the biodegradation of TPH and other contaminants. Airflow can be stimulated either by injection or vacuum.
- Gaseous Electron Donor Injection: This cleanup technology involves installation of wells for injection of gaseous electron donors into the soil. Equipment needed for this technology would include blowers/vacuums.
- Thermal Desorption: This cleanup technology refers to the application of heat to volatilize and separate organic contaminants from soil. Heat would be produced using electrodes to heat soil, blowers, and pumps.

The electricity-consuming equipment used for the GETS, SVE/air sparging, bioventing, and gaseous electron donor injection is similar to the electrical equipment used for pump and treat systems. Pump and treat systems are commonly used for groundwater extraction and remediation and, similarly, rely on the use of pumps, blowers and other machinery. Based on publicly available data for pump and treat systems, it is estimated that continuous motor operation under load (for pumps, blowers, and other machinery) uses over 8,000 kWh of electrical energy per motor horsepower per year. A 50-horsepower (38 kW) blower is a typical industrial sized piece of machinery that could be used to implement SVE/air sparging, bioventing, and gaseous electron donor injection at the project site (TRS, 2010). A 50-horsepower (38 kW) blower would proportionally use 400,000 kwh of electrical energy per year. This amount of energy is equivalent to the electricity used by approximately 68 homes on average per year (USEPA, 2009). While the quantity of soil that would be cleaned up using bioventing and gaseous electron donor injection is currently unknown, this rate of energy usage would be substantial for systems that would concurrently operate multiple pumps, blowers and/or vacuums to clean up large quantities of contaminated soil. In addition, continuous operation of pumping equipment associated with the GETS also has the potential to consume substantial amounts of energy (8,000 kWh of electrical energy per motor horsepower per year).

Chapter 3.0, *Project Description*, of this PEIR, provides further details regarding SVE. As proposed, the overall site cleanup includes a SVE system that would operate 150 extraction wells continuously over 3 years. These details provide enough information to determine an estimated total quantity of electricity consumption for the proposed SVE system. However, future cleanup of the site may result in implementation of SVE in other areas of the site and for groundwater cleanup. At the time of this analysis, details for the use of SVE in other areas of the site or for groundwater cleanup have not been defined. Thus, this analysis estimates the total amount of electricity consumption specifically for the proposed SVE consisting of 150 extraction wells and operated continuously over 3 years. In a study published by TRS, Inc., the electrical energy requirement associated with SVE systems were quantified and found that an SVE system

consisting of 25 extraction wells and operated continuously over 3 years (26,300 hours) would consume approximately 1,000,000 kWh of electrical energy (TRS, 2010). Therefore, proportionately, it is estimated that the proposed SVE system would consume a total of approximately 6,000,000 kWh of electrical energy. This amount of energy is equivalent to the electricity used by approximately 340 homes on average over a 3-year period and presents a substantial quantity of electricity usage.

Thermal desorption uses similar electricity-consuming equipment as Electrical Resistance Heating (ERH) technology, including electrodes to heat soil, blowers, and pumps. For the East Gate Disposal Yard Remediation project in Fort Lewis, Washington, it was estimated that an ERH system used at that site consumed approximately 9,180,000 kWh over 172 days of operation, which is approximately 6 months (Wiley Periodicals, 2007). This system consisted of 101 electrodes and was used to clean up a volume of 36,500 CY of soil where chlorinated volatile organic compounds represent the primary chemicals of concern (Wiley Periodicals, 2007). It can be assumed that a thermal desorption system consisting of a similar number of electrodes and operated at the same level of intensity would consume approximately the same quantity of electricity. Thus, the electricity consumption rate associated with this technology is substantial.

Due to the proposed use of the GETS and electricity-consuming cleanup technologies identified above, the project has the potential to consume substantial quantities of electricity. The project does not propose any energy-efficient practices to reduce proposed electricity consumption. However, energy conservation measures would be implemented at the project site to reduce proposed electricity consumption. Implementation of Mitigation Measures EC-1 and EC-2 would ensure that electricity is used as efficiently as possible for all electricity-consuming activities where energy-efficient practices are attainable. With implementation of Mitigation Measures EC-1 and EC-2, the proposed project would use electricity as efficiently as currently possible and, therefore, would have a less-than-significant impact.

Natural Gas

Natural gas is not currently used for existing site operations and the overall site cleanup does not propose the use of natural gas. Therefore, there would be no impact concerning the efficient use of natural gas.

> Conclusion: The overall site cleanup would result in the consumption of energy; however, implementation of energy conservation measures would reduce impacts. Mitigation Measures AQ-1 and GHG-2 require the use of more fuel-efficient vehicles; Mitigation Measures AQ-5 and TRANS-1 restrict vehicle idling, which would reduce fuel usage; and Mitigation Measure GHG-1 requires the reuse of non-hazardous debris (such as crushed concrete), reducing the number of truck trips. In addition, Mitigation Measure GHG-3 prescribes a Greenhouse Gas Emissions Reduction Plan that requires the reduction and offset of project-related GHG emissions generated by fuel combustion sources. Mitigation Measures EC-1 and EC-2 would ensure that electricity is used efficiently for all electricity-consuming activities where energy-efficient practices are attainable. This impact would be less than significant with mitigation incorporated.

Impact 4.13-1a Determination: *The* ***overall site cleanup*** *would result in energy consumption; however, implementation of Mitigation Measures AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, TRANS-1, EC-1, and EC-2 would require that energy is used efficiently. This impact would be* ***less than significant with mitigation incorporated****.*

Initial Project Assessment

Impact 4.13-1b: Would the initial activities result in the inefficient use of energy resources?

Initial Activities (Impact 4.13-1b)

As discussed in Section 3.7, *Initial Activities*, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

Petroleum

Table 4.13-4 presents the maximum estimated fuel use for each initial activity. As shown, the initial activities that involve excavation, demolition, and disposal would consume an estimated 4,830,000 gallons of petroleum fuels over 3 years.

The post-closure activities involving only monitoring and maintenance activities and are anticipated to consume 4,830,000 gallons of gasoline over 30 years due to worker commutes. Like the overall site cleanup, the initial activities would result in the consumption of fuel associated with worker trips, truck trips, or construction equipment. However, implementation of Mitigation Measures AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, and TRANS-1 would reduce the quantity of petroleum fuels consumed by the initial activities for the same reasons outlined under Impact 4.13-1a. Impacts related to the efficient use of petroleum would be less than significant with mitigation incorporated.

TABLE 4.13-4
INITIAL ACTIVITIES' MAXIMUM FUEL CONSUMPTION [A]

Initial Activity [a]	Diesel (gallons/year)	Gasoline (gallons/year)
DOE Area IV	1,040,000	7,140
NASA Liquid Oxygen Plant	238,000	7,140
DOE Demolition Activities	101,000	16,000
Thermal Treatment Facility Closure	68,000	5,710
RMHF and HWMF Closure	116,000	14,300
Total (gallons/year)	**1,560,000**	**50,700**
Diesel and Gasoline Combined Total (gallons/year)	**1,610,000**	
Diesel and Gasoline Combined Total to complete Initial Activity (gallons)b	**4,830,000**	
Area I, II and III Impoundment Post-Closure (gallons/year)	0	36,600
Area I, II and III Impoundment Post-Closure (gallons)c	**1,100,000**	

a. Calculations are based on the use of 96 trucks per day.
b. Total based on cleanup activities implemented over 3 years.
c. Total based on post-closure activities implemented over 30 years.

SOURCE: ESA, 2017e.

Electricity

The initial activities would rely on the use of petroleum for power. None of the electricity-consuming cleanup technologies described for the overall site cleanup and identified under Impact 4.13-1a would be implemented for the initial activities. Use of the GETS and surface water treatment systems is not proposed under the initial activities and is evaluated for the overall site cleanup (refer to Impact 4.13-1a). Electricity usage for the initial activities would result from ongoing use of field office buildings. During the initial activities, it is anticipated that the monthly quantity of electricity consumed by the existing office buildings would remain approximately the same as existing conditions. Therefore, the initial activities would result in a less-than-significant impact with regard to the efficient use of electricity.

Natural Gas

The initial activities do not propose the use of natural gas. Therefore, there would be no impact concerning the efficient use of natural gas.

> Conclusion: The initial activities would result in the consumption of petroleum fuels and electricity onsite. However, Mitigation Measures AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, and TRANS-1 would require that petroleum fuels and electricity are used efficiently. Therefore, this impact would be less than significant with mitigation incorporated.

Impact 4.13-1b Determination: *The **initial activities** would result in a greater use of energy. However, implementation of Mitigation Measures AQ-1, AQ-5, GHG-1, GHG-2, GHG-3 and TRANS-1 would require that energy is used efficiently. This impact would be **less than significant with mitigation incorporated**.*

4.13.5.2 Transportation Energy

Program Assessment

Impact 4.13-2a: Would the **overall site cleanup** increase transportation energy use requirements?

Overall Site Cleanup (Impact 4.13-2a)

The overall site cleanup would primarily rely on excavation and offsite disposal for project implementation. An average of 80 trucks would be used daily, and 250 workers would commute to the project site daily. The project does not propose to rely on any alternative sources of transportation, and would rely solely on diesel-powered truck and gasoline-powered worker vehicles for project implementation. Post-cleanup monitoring and maintenance activities would rely on gasoline-powered worker vehicles. As shown in **Table 4.13-5**, the overall site cleanup has the potential to use a maximum of 16,100,000 gallons of petroleum for transportation needed to clean up the site and 2,390,000 gallons of petroleum for transportation needed for post-cleanup monitoring and maintenance activities.

TABLE 4.13-5
OVERALL SITE CLEANUP ESTIMATED TRANSPORTATION ENERGY USE

Overall Site Cleanup Phase	Diesel (gallons/ year)	Gasoline (gallons/year)	Diesel/Gasoline Combined Total (gallons/year)	Diesel/Gasoline Combined Total to Complete Phase (gallons)
Cleanup Activities (Excavation and Offsite Disposal)	1,170,00	177,000	1,344,000	16,100,000[a]
Post-Cleanup Monitoring and Maintenance Activities	0	79,800	79,800	2,390,000 [b]

a. If the overall site cleanup were to rely on an average of 80 truck trips per day, the excavation and offsite disposal cleanup activities would be completed in 12 years. This total presents the total petroleum use over 12 years.
b. This total presents the total petroleum use over 30 years.
Source: ESA, 2017e.

These estimates present substantial increases in transportation energy use. In addition, the overall site cleanup does not propose the use of efficient transportation alternatives. However, the project includes mitigation measures to increase efficiency of fuel usage and transportation. Implementation of Mitigation Measures AQ-1 and GHG-2 require the use of more fuel-efficient vehicles; Mitigation Measures AQ-5 and TRANS-1 would restrict vehicle idling, which would reduce fuel usage; and Mitigation Measure GHG-1 requires the reuse of non-hazardous debris (such as crushed concrete), which would reduce the number of trips. In addition, Mitigation

Measure GHG-3 prescribes a Greenhouse Gas Emissions Reduction Plan that requires the reduction and offset of project-related GHG emissions generated by fuel combustion sources. Implementation of these mitigation measures would reduce the project's increased transportation energy uses and would ensure that efficient transportation alternatives are implemented. Therefore, this impact would be less than significant.

> Conclusion: The overall site cleanup would increase transportation energy use and does not propose any efficient transportation alternatives; however, implementation of energy conservation measures would reduce impacts. Mitigation Measures AQ-1 and GHG-2 require the use of more fuel-efficient vehicles; Mitigation Measures AQ-5 and TRANS-1 restrict vehicle idling, which would reduce fuel usage; and Mitigation Measure GHG-1 requires the reuse of non-hazardous debris (such as crushed concrete), reducing the number of truck trips. In addition, Mitigation Measure GHG-3 requires the reduction and offset of project-related GHG emissions generated by fuel combustion sources. This impact would be less than significant with mitigation incorporated.

Impact 4.13-2a Determination: *The* ***overall site cleanup*** *would increase transportation energy use requirements; however, implementation of Mitigation Measures AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, and TRANS-1 would require that transportation energy is used efficiently and would ensure that efficient transportation alternatives are implemented. This impact would be* ***less than significant with mitigation incorporated****.*

Initial Project Assessment

Impact 4.13-2b: Would the initial activities increase transportation energy use requirements?

Initial Activities (Impact 4.13-2b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

The initial activities would primarily rely on excavation, demolition, and offsite disposal for implementation. A maximum of 96 trucks would be used daily, and a maximum of 71 workers would commute to the project site daily. The initial activities do not propose to rely on alternative

sources of transportation, and would solely rely on diesel-powered trucks and gasoline-powered worker vehicles for cleanup. Areas I, II and III post-closure activities would rely on gasoline-powered worker vehicles. As shown in **Table 4.13-6**, the initial activities have the potential to use a maximum of 1,100,000 gallons of petroleum for transportation needed for cleanup and 1,100,000 gallons of petroleum for transportation needed for Areas I, II and III post-closure activities.

TABLE 4.13-6
INITIAL ACTIVITIES ESTIMATED TRANSPORTATION ENERGY USE

Initial Cleanup Phase	Diesel (gallons/ year)	Gasoline (gallons/year)	Diesel/Gasoline Combined Total (gallons/year)	Diesel/Gasoline Combined Total to Complete Phase (gallons)
Excavation, Demolition and Offsite Disposal	324,000	45,000	368,000	1,100,000[a]
Area I, II and III post-closure	0	36,600	36,600	1,100,000 [b]

[a]. This total is the summation of the Diesel/Gasoline Combined Total over 3 years.
[b]. This total presents the total petroleum use over 30 years.

Source: ESA, 2017e.

These estimates present substantial increases in transportation energy use. In addition, the initial activities do not propose the use of efficient transportation alternatives. Therefore, mitigation is recommended to increase efficiency of fuel usage and transportation. Implementation of Mitigation Measures AQ-1 and GHG-2 require the use of more fuel-efficient vehicles; Mitigation Measures AQ-5 and TRANS-1 would restrict vehicle idling, which would reduce fuel usage; and Mitigation Measure GHG-1 requires the reuse of non-hazardous debris (such as crushed concrete), which would reduce the number of truck trips. In addition, Mitigation Measure GHG-3 prescribes a Greenhouse Gas Emissions Reduction Plan that requires the reduction and offset of project-related GHG emissions generated by fuel combustion sources. Implementation of these mitigation measures would reduce the initial activities' increased transportation energy uses and would ensure that efficient transportation alternatives are implemented. Therefore, this impact would be less than significant.

> Conclusion: The initial activities would increase transportation energy use and do not propose efficient transportation alternatives; however, implementation of energy conservation mitigation measures would reduce impacts. Mitigation Measures AQ-1 and GHG-2 require the use of more fuel-efficient vehicles; Mitigation Measures AQ-5 and TRANS-1 restrict vehicle idling, which would reduce fuel usage; and Mitigation Measure GHG-1 requires the reuse of non-hazardous debris (such as crushed concrete), reducing the number of truck trips. In addition, Mitigation Measure GHG-3 prescribes a Greenhouse Gas Emissions Reduction plan that requires the reduction and offset of project-related GHG emissions generated by fuel combustion sources. Therefore, this impact would be less than significant with mitigation incorporated.

Impact 4.13-2b Determination: *The **initial activities** would increase transportation energy use requirements; however, implementation of Mitigation Measures AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, and TRANS-1 would require that transportation energy is used efficiently and would ensure that efficient transportation alternatives are implemented. This impact would be **less than significant with mitigation incorporated**.*

4.13.5.3 Result in Need for Additional Energy Capacity

Program Assessment

Impact 4.13-3a: Would the overall site cleanup increase demand (including peak and base period demands) on local and regional energy supplies that result in the need for additional capacity?

Overall Site Cleanup (Impact 4.13-3a)

Petroleum

Overall site cleanup activities would consume a maximum total of 18,400,000 gallons of petroleum fuels and post-cleanup monitoring and maintenance activities would consume a maximum total of 2,390,000 gallons of petroleum fuels (see Table 4.13-3). As of December 31, 2015, California has 2,860 million barrels of crude oil left in the state's reserves (USEIA, 2016a). In addition, according to the USEIA International Energy Outlook 2016, the global supply of crude oil, other liquid hydrocarbons, and biofuels is expected to be adequate to meet the world's demand for liquid fuels through 2040 (USEIA, 2016a). It is not anticipated that the project would increase demand for petroleum supplies such that available local and regional energy supplies would not be capable of serving the project. Therefore, this impact would be less than significant.

Electricity

The overall site cleanup has the potential to consume substantial quantities of electricity due to the proposed use of electricity-consuming cleanup technologies, offices, the GETS, and surface water treatment facilities. In addition, the GETS, surface water treatment systems, and proposed electricity-consuming cleanup technologies would be operated continuously as needed at any time of day. The existing office buildings would continue to be operated primarily during business hours, approximately 7:00 a.m. to 7:00 p.m. Monday through Friday. Therefore, the proposed electricity demand at the project site would occur throughout the SCE summer Mid-Peak and On-Peak demand periods and winter Mid-Peak demand period. As noted in the discussion for Impact 4.13-1a, the equipment used for the GETS, SVE/air sparging, bioventing, and gaseous electron donor injection have the potential to use 8,000 kWh of electrical energy per motor hp per year. The proposed SVE system is estimated to consume approximately 6,000,000 kWh over 3 years. In addition, the consumption rate associated with thermal desorption is also anticipated to be substantial (e.g., 9,180,000 kWh over 172 days of operation for a system consisting of 101 electrodes). While it is anticipated that these technologies would consume substantial quantities of energy during the above-mentioned Mid-Peak and On-Peak demand periods, they would not result in SCE needing additional capacity to serve the project. SCE monitors and maintains a vast electricity system that provides electricity to 15 million people

(SCE, 2016a). As an electricity supply company, SCE has the ongoing ability to generate or purchase energy based on demand within SCE's service area. To ensure energy availability and reliability for existing and future consumers, SCE engages in ongoing planning efforts that involve power use projections, system upgrades, and changes to their power mix (SCE, 2016a). **Table 4.13-7** shows the 2014 California Energy Demand Update (CEDU) mid scenario for SCE's electricity consumption and peak demand for selected years.

TABLE 4.13-7
CEDU 2014 MID CASE DEMAND
BASELINE FORECASTS OF SCE ELECTRICITY DEMAND

Year(s)	*CEDU 2014 Mid Energy Demand*
	Consumption (GWh)
2016	102,218
2020	106,875
2024	112,247
2025	113,612
	Average Annual Growth Rates
2013-2016	0.99%
2013-2024	1.13%
2013-2025	1.13%
	Coincident Peak (MW)
2016	23,537
2020	24,724
2024	25,784
2025	26,030
	Average Annual Growth Rates
2014-2016	1.29%
2014-2024	1.17%
2014-2025	1.15%

Source: CEC, 2014b.

As shown in Table 4.13-7, SCE's energy demand is forecasted to increase from 102,218 gigawatt hours (GWh) in 2016 to 113,612 GWh in 2025. This presents an increase of 11,394 GWh in consumption. SCE's coincident peak demand is forecasted to increase from 23,537 MW in 2016 to 26,030 MW in 2025. This presents an increase of 2,493 MW. While specific engineering/system design plans have not been specified for the electricity-consuming cleanup technologies, it can be assumed that even if three cleanup systems similar to the proposed SVE system were to be operated over the same 3-year period, approximately 18,000,000 kWh (18 GWh) would be consumed over 3 years. This is equivalent to 0.16 percent of the forecasted increase in consumption for SCE's service area (11,394 GWh). Thus, the proposed project's electricity usage is anticipated to be substantially lower than SCE's forecasted demand and coincident peak demand for the SCE service area. The overall site cleanup alone would not be capable of consuming so much electricity that SCE would not be able to provide energy to the SCE service area with the variety and abundance of energy resources currently available to SCE. Therefore, this impact would be less than significant.

Natural Gas

The overall site cleanup does not propose the use of natural gas service. Therefore, there would be no impact concerning the potential to result in the need for additional capacity for natural gas.

> Conclusion: The overall site cleanup would consume substantial quantities of petroleum and electricity. However, the overall site cleanup is not expected to increase demand on local and regional energy supplies such that additional capacity is need. This impact would be less than significant.

Impact 4.13-3a Determination: *The* ***overall site cleanup*** *would not increase demand on local and regional energy supplies that result in the need for additional capacity. This impact would be* ***less than significant****.*

Initial Project Assessment

Impact 4.13-3b: Would the initial activities increase demand (including peak and base period demands) on local and regional energy supplies that result in the need for additional capacity?

Initial Activities (Impact 4.13-3b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure

- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

Petroleum

The initial activities that involve excavation, demolition and disposal would consume an estimated 4,830,000 gallons of petroleum fuels over 3 years. The post-closure activities involving only monitoring and maintenance activities and are anticipated to consume 1,100,000 gallons of gasoline over 30 years due to worker commutes (see Table 4.13-4). The post-closure activities described for the RCRA Post-Closure and Hazardous Waste Facility Closure initial project would involve only monitoring and maintenance activities and are anticipated to consume 36,600 gallons of gasoline per year for worker commutes. As of December 31, 2015, California has 2,845 million barrels of crude oil left in the State's reserves (USEIA, 2016a). In addition, according to the USEIA International Energy Outlook 2016, the global supplies of crude oil, other liquid hydrocarbons, and biofuels are expected to be adequate to meet the world's demand for liquid fuels through 2040. Therefore, it is not anticipated that the initial activities would increase demand for petroleum supplies such that available local and regional energy supplies would not be capable of serving the projects. This impact would be less than significant.

Electricity

The initial activities would rely on the use of existing office buildings and are anticipated to consume approximately the same quantity of electricity as existing conditions (see Impact 4.13-1b). The office buildings would continue to be operated primarily during business hours, approximately 7:00 a.m. to 7:00 p.m., Monday through Friday. Therefore, the electricity demand of the initial activities would occur throughout the summer Mid-Peak and On-Peak periods and winter Mid-Peak period. Because electricity usage associated with the initial activities would not differ substantially from existing ongoing electricity usage, including usage during peak demand periods, it is expected that SCE would not need additional capacity to serve the initial activities. This impact would be less than significant.

Natural Gas

The initial activities do not propose the use of natural gas service. Therefore, there would be no impact concerning the potential to result in the need for additional capacity for natural gas.

> Conclusion: The initial activities would consume substantial quantities of petroleum and would consume approximately the same quantity of electricity as existing conditions. The initial activities are not expected to increase demand on local and regional energy supplies such that additional capacity is needed. This impact would be less than significant.

Impact 4.13-3b Determination: *The* ***initial activities*** *would not increase demand on local and regional energy supplies that result in the need for additional capacity. This impact would be* ***less than significant.***

4.13.5.4 Conflicts with Existing Energy Standards, Policies and Regulations

Program Assessment

Impact 4.13-4a: Would the overall site cleanup conflict with existing energy standards, policies and regulations?

Overall Site Cleanup (Impact 4.13-4a)

Section 4.13.2, *Regulatory Setting* presents the existing energy standards, policies and regulations applicable to the overall site cleanup. California SB 350 is not directly applicable to the proposed project. It requires that publicly owned utilities in California procure 33 percent of their electricity sales from eligible renewable sources by 2020, and 50 percent by the end of 2030. The project would be provided electricity by SCE, a public utility. The renewable procurement status for SCE in 2014 was 23.2 percent. The percentage of RPS procurement currently under contract for 2020 is 36.9 percent (CPUC, 2016). Thus, the project's electricity supply would be provided by a public utility that is in compliance with the 2013 RPS goal and is on track to achieve the 2030 RPS goal.

The California Energy Code includes standards mandating energy conservation measures in new construction for heating, cooling, ventilation, water heating, and lighting. The overall site cleanup does not propose the construction of any new facilities that would require heating, cooling, ventilation, water heating, and/or lighting. In addition, the project would implement Mitigation Measures EC-1 and EC-2, which requires the use of energy-efficient lighting and appliances and energy-saving practices for existing facilities. Thus, it is anticipated that the overall site cleanup would not conflict with the California Energy Code.

Table 4.13-8 presents a consistency analysis of all applicable energy goals and policies established in the Ventura County General Plan. As shown, the overall site cleanup would be consistent with all applicable energy goals and policies with implementation of Mitigation Measures AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, TRANS-1, EC-1, and EC-2.

> Conclusion: The overall site cleanup would be consistent with all existing energy standards, policies, and regulations applicable to the project. This impact would be less than significant.

Impact 4.13-4a Determination: *The* ***overall site cleanup*** *would comply with existing energy standards, policies, and regulations, with implementation of Mitigation Measures AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, TRANS-1, EC-1, and EC-2. This impact would be* ***less than significant****.*

TABLE 4.13-8
CONSISTENCY WITH GENERAL PLAN ENERGY GOALS AND POLICIES

Applicable General Plan Goals and Policies	Consistency Analysis
Energy Resources Goals	
1.9.1.1 Promote land use patterns which minimize energy consumption.	**Consistent.** Cleanup activities would temporarily bring workers, trucks, and construction equipment to the project site, which is surrounded by regional population centers including Simi Valley, Thousand Oaks, Van Nuys, Burbank, and San Fernando (NASA, 2014). Therefore, the overall cleanup project and initial activities are not located in a remote area that would require workers to travel great distances to work at the project site. This presents a temporary use of the land that is consistent with the goal of minimizing energy, particularly fuel consumption. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. After cleanup activities are complete, monitoring and maintenance activities would continue at the site, which would involve a minimal number of employees who would likely live within the project region. Also, the overall site cleanup project and initial activities are required to conserve energy through Mitigation Measures AQ-5, GHG-1, GHG-2, GHG-3, TRANS-1, EC-1, and EC-2.
1.9.1.2 Encourage the use of *renewable* sources of *energy* and energy conservation techniques in new development.	**Consistent.** The overall site cleanup and initial activities would use substantial quantities of fossil fuels for project implementation. While the initial activities would not significantly consume electricity, the overall site project has the potential to demand substantial quantities of electricity. Neither the overall site cleanup project nor initial activities propose to use renewable sources of energy or energy conservation techniques. However, the overall site cleanup project and initial activities would be required to implement energy conservation techniques through Mitigation Measures AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, TRANS-1, EC-1, and EC-2 (Mitigation Measures EC-1 and EC-2 are applicable to the overall site cleanup only).
1.9.1.3 Encourage retrofit programs for energy conservation.	**Consistent.** The overall site cleanup project and initial activities would ultimately remove most structures onsite. The retrofit of office buildings operated during cleanup and post-closure activities is not proposed. However, the overall site cleanup project would be required to conserve electricity through Mitigation Measures EC-1 and EC-2, which requires the use of energy-efficient light bulbs and appliances.
1.9.1.4 Encourage increased fuel efficiency of vehicles and decreased number and length of vehicle trips.	**Consistent.** The overall site cleanup project and initial activities would implement Mitigation Measures AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, and TRANS-1, which were designed in part to increase fuel efficiency and decrease the number and length of vehicle trips.
Energy Resources Policies	
1.9.2.1 Discretionary development shall be evaluated for impact to energy resources and utilization of energy conservation techniques.	**Consistent.** The energy assessment provided in this section (Section 4.13) provides an evaluation of impacts to energy resources and use of energy conservation techniques. Therefore, overall site cleanup project and initial activities are consistent with this policy.

Initial Project Assessment

Impact 4.13-4b: Would the initial activities conflict with existing energy standards, policies, and regulations?

Initial Activities (Impact 4.13-4b)

As discussed in Section 3.7, *Initial Activities*, of this PEIR, the RPs would implement the following projects as soon as possible after approval by DTSC:

- DOE Area IV Radiological and Contiguous Chemically Contaminated Soil Removal
- NASA Liquid Oxygen Plant
- DOE Building Demolition Activities
- Thermal Treatment Facility Closure
- Radioactive Materials Handling Facility Closure
- Hazardous Waste Management Facility Closure
- Area I/III Impoundment Post-Closure
- Area II Impoundment Post-Closure

As discussed for the overall cleanup project, the initial activities would comply with California SB 350. The initial activities are not anticipated to use significantly more electricity than currently used onsite. The proposed electricity required for the initial activities would continue to be provided by SCE, which is a public utility. SCE is in compliance with the 2013 RPS goal and is on track to achieve the 2030 RPS goal as established in California SB 350. Thus, it is anticipated that the initial activities would be serviced by a public utility that is in compliance with California SB 350.

The initial activities are also required to comply with the California Energy Code as mandated by law. The initial activities do not propose the construction of any new facilities that would require heating, cooling, ventilation, water heating, and/or lighting. Thus, it is anticipated that the initial activities would not conflict with California Energy Code.

The Ventura County General Plan consistency analysis presented in Table 4.13-8 is also applicable to the initial activities. As shown, the initial activities would be consistent with all applicable energy goals and policies.

> Conclusion: The initial activities would be consistent with all existing energy standards, policies, and regulations applicable to the project, with implementation of Mitigation Measures AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, TRANS-1, EC-1, and EC-2. This impact would be less than significant.

Impact 4.13-4b Determination: *The* ***initial activities*** *would comply with existing energy standards, policies, and regulations, with implementation of Mitigation Measures AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, TRANS-1, EC-1, and EC-2. This impact would be* ***less than significant****.*

4.13.6 Mitigation Measures

The following measures[2] shall be implemented to mitigate impacts related to energy consumption:

AQ-1: Off-Road Road Engine Efficiencies (see Section 4.2.6 for description).

AQ-5: Idling Restrictions (see Section 4.2.6 for description).

GHG-1: Recycling Requirement (see Section 4.6.6 for description).

GHG-2: On-Road Road Vehicle Fleet Requirements (see Section 4.6.6 for description).

GHG-3: Greenhouse Gas Emissions Reduction Plan (see Section 4.6.6 for description).

TRANS-1: Site-Wide Traffic Management Plan (see Section 4.11.6 for description).

EC-1: Energy Conservation - New Onsite Facilities. The following measures shall be implemented by the RPs, under the direction of DTSC, to conserve electricity for new onsite facilities to be used for office functions (assumed to be trailers or other prefabricated non-permanent structures) by the RPs or their contractors for administration of cleanup activities:

- Exterior walls on all temporary office buildings shall be insulated and be equipped with Energy Star® rated double-paned insulated glass windows.
- Exterior doors on temporary office buildings shall be solid core insulated and sealed with weather stripping.
- White reflective roofing or covering shall be included on all temporary office buildings.
- LED light bulbs shall be used for project office lighting and outdoor office security lighting, as appropriate.
- Dusk-to-dawn outdoor sensors and/or motion activated sensors shall be used for all outdoor project security lighting, as appropriate.
- Motion-activated light switches or automatic shut-off timers shall be used for all indoor project office lighting.
- All refrigerators and other kitchen appliances used onsite for the project shall be Energy Star® rated, as applicable.

[2] Some of the mitigation measures in this section include recommendations from USEPA's: *Green Remediation: Best Management Practices for Excavation and Surface Restoration*, December 2008.

- Offices shall include programmable thermostats with occupancy sensors that shut off the HVAC system when vacant**.**

EC-2: Energy Conservation – New Onsite Equipment. The following measures shall be implemented by the RPs, under the direction of DTSC, to conserve electricity for new equipment that would be used for project activities:

- The newest commercially available models for all pumps, vacuums, and blowers shall be used to implement soil vapor extraction/air sparging, bioventing, and gaseous electron donor injection.
- Pumps, vacuums, and blowers used to implement soil vapor extraction/air sparging, bioventing, and gaseous electron donor injection shall be sized such that smallest specified horsepower or kilo wattage is used, as appropriate.

4.13.7 Impact Summary

Table 4.13-9 summarizes the proposed project's impacts and significance determinations related to energy consumption.

TABLE 4.13-9
SUMMARY OF IMPACTS – ENERGY CONSUMPTION

Impacts	Overall Project	DOE Initial Project	NASA Initial Project	DOE Demolition Activities	RCRA Post-Closure and Facility Closure	Mitigation Measures
Impact 4.13-1a: Energy efficiency	LSM	--	--	--	--	AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, TRANS-1, EC-1, EC-2
Impact 4.13-1b: Energy efficiency	--	LSM	LSM	LSM	LSM	AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, and TRANS-1
Impact 4.13-2a: Transportation energy	LSM	--	--	--	--	AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, TRANS-1
Impact 4.13-2a: Transportation energy	--	LSM	LSM	LSM	LSM	AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, TRANS-1
Impact 4.13-3a: Result in need for additional energy capacity	LTS	--	--	--	--	None
Impact 4.13-3b: Result in need for additional energy capacity	--	LTS	LTS	LTS	LTS	None
Impact 4.13-4a: Conflicts with energy regulations	LSM	--	--	--	--	AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, TRANS-1
Impact 4.13-4b: Conflicts with energy regulations	--	LSM	LSM	LSM	LSM	AQ-1, AQ-5, GHG-1, GHG-2, GHG-3, TRANS-1

LTS = Less-than-significant impact
LSM = Less than significant with mitigation incorporated
S&U = Significant and unavoidable impact

CHAPTER 5
Cumulative Impacts

5.1 Introduction

This section presents an analysis of the cumulative effects of implementation of the overall site cleanup and initial activities in combination with other past, present, and reasonably foreseeable future projects within the project site and surrounding area that could cause related environmental impacts similar to the environmental impacts anticipated to occur under the proposed project as discussed in this PEIR.

CEQA Guidelines Section 15130 requires that an EIR shall discuss cumulative impacts of a project when the project's incremental effect is "cumulatively considerable." "Cumulative impacts" are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines, Section 15355; see also Public Resources Code, Section 21083, subd. (b)). Stated another way, "a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts" (CEQA Guidelines, Section 15130, subd. (a)(1)). The definition of cumulatively considerable is provided in Section 15065(a)(3):

> *Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.*

According to Section 15130(b) of the CEQA Guidelines:

> *[t]he discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.*

For purposes of this PEIR, the proposed project would cause a cumulatively considerable and, therefore, significant cumulative impact if:

- The cumulative effects of other past, current, and probable future projects without the project are not significant and the project's incremental impact is substantial enough, when added to the cumulative effects, to result in a significant impact; or
- The cumulative effects of other past, current, and probable future projects without the project are already significant and the project would result in a cumulatively considerable contribution to the already significant effect. The standards used herein to determine whether the contribution is cumulatively considerable include the existing baseline environmental conditions, and whether the project would cause a substantial increase in impacts, or otherwise exceed an established threshold of significance.

5.2 Geographic Scope

The geographic area affected by the proposed project and its potential to contribute to cumulative impacts varies based on the environmental resource under consideration. Generally, the geographic area associated with the environmental effects of the project as described in Chapter 3 define the boundaries of the area used for compiling the list of past, present, and reasonably foreseeable future related projects considered in the cumulative impact analysis. The air quality analysis, however, includes consideration of regional air emissions (e.g., ROG/NO_x, and PM) and, therefore, could include projects throughout the air basins the project potentially impacts. Conversely, in the case of noise impacts, a smaller, more localized area surrounding the immediate project site is appropriate for consideration. **Table 5-1** presents the geographic areas analyzed to determine if the project's contribution to a particular impact would be cumulatively considerable and, therefore, significant. An explanation of the geographic scope selected for each resource is also briefly included under the impact analysis.

5.3 Temporal Scope

This cumulative impact analysis considers other projects that have been recently completed, are currently under construction, or are reasonably foreseeable (e.g., for which an application has been submitted). Both short-term and long-term cumulative impacts of the proposed project, in conjunction with other cumulative projects in the area, are evaluated in this chapter.

The schedule and timing of the proposed project and other cumulative projects is relevant to the consideration of cumulative impacts. The cumulative impact analysis pays particular attention to cumulative projects in the identified geographic scope with implementation schedules that could overlap with the proposed project schedule.

TABLE 5-1
GEOGRAPHIC SCOPE OF CUMULATIVE IMPACTS ANALYSIS

Resource Issue	Geographic Scope
Aesthetics	The foreground zone that extends 0.25 miles to 0.5 miles from the project site and the middleground zone that extends from the foreground up to 3 to 5 miles. Cumulative projects would be limited to development projects on ridgelines that could be seen within the viewshed from the KOPs, as well as other projects within the project boundary.
Air Quality	The geographic area(s) of analysis for air quality may include any air basin or portion of an air basin the project potentially impacts.
Biological Resources	The project site and surrounding lands, as well as drainages that are connected to the project site, including those that run through Bell Canyon and Meier Canyon.
Cultural Resources	The geographic area of analysis for cultural resources includes the Simi Hills.
Geology and Soils	The project site and areas immediately adjacent to the project site that could affect slope and soil stability during project construction.
Greenhouse Gases	The geographic scope consists of the jurisdictional areas in which project GHG emissions are emitted and/or regulated. This potentially includes the federal, State or regional basis. For this project, the potential geographic scope for cumulative analysis would be the State of California, counties of Ventura and Los Angeles, and city of Los Angeles.
Hazardous Materials	The geographic scope encompasses the project site and the proposed transportation haul routes used for disposal of hazardous soils and building debris.
Hydrology and Water Quality	The Los Angeles River and Calleguas Creek Watersheds
Land Use and Planning	All past, present, and reasonably foreseeable projects located on lands designated as Open Space in the Ventura County General Plan.
Noise	Generally within 500 feet of project-related sources of noise, such as the project site, areas immediately adjacent areas, and noise-sensitive land uses along project transportation routes including Woolsey Canyon Road and Topanga Boulevard.
Transportation and Traffic	The geographic scope for cumulative impacts to transportation and traffic focuses on projects located such that traffic generated by those projects would use one or more of the four haul routes for the proposed project during the anticipated 2018–2032 remediation period.
Utilities and Service Systems	The geographic scope of the cumulative solid waste analysis includes the service areas of the solid waste disposal facilities that would most likely serve the project site, as identified in Section 4.12, *Utilities and Service Systems*, of this PEIR.
Energy Resources	The geographic scope of the cumulative energy consumption analysis includes the State of California for petroleum supply, the SCE service area for electrical power supply, and the SoCal Gas service area for natural gas supply.

5.3.1 Overall Site Cleanup

Table 3-7 of this PEIR, presents the duration for each of the methodologies that would be employed as part of the overall site cleanup. Initial site cleanup activities would be initiated after certification of this PEIR and the Program Management Plan, and DTSC approval of the initial cleanup decision documents. Soil excavation and disposal activities would begin with the first excavations performed for the initial activities. It is estimated that soil and groundwater cleanup activities would begin after DTSC certifies the PEIR and the respective cleanup decision documents. Groundwater cleanup activities and monitoring would occur until cleanup requirements are met. Monitoring activities may occur over a longer period of time (to be determined based on confirmation sampling for in situ remediation and enhanced or natural

attenuation of constituents in soils or groundwater). Any one or a combination of cleanup technologies presented in Section 3.6 could be used to achieve the project's remedial objectives.

Groundwater cleanup has been initiated through operation of the Groundwater Extraction and Treatment System. However, final/comprehensive groundwater cleanup would be initiated after DTSC approval of the groundwater cleanup decision documents, and is expected to take a minimum of 10 years to complete, but could be much longer. Natural attenuation monitoring activities are being considered as a final phase of the groundwater cleanup, which would require ongoing monitoring over a longer period of time, and will be specified in cleanup decision documents.

5.3.2 Initial Activities

Activities associated with the initial activities would commence within a few months of approval of the PEIR and DTSC approval of the respective cleanup decision document. The initial activities would occur during the first approximately 15 months of the overall site cleanup. The initial activities mostly involve soil excavation and offsite disposal of soil, with some onsite stockpiling and onsite treatment methods, as well as building demolition. The initial activities represent the first phase of the overall site cleanup described above, which is anticipated to last for approximately 15 years.

5.4 Method of Analysis

5.4.1 CEQA Guidelines

CEQA Guidelines Section 15130 provides that the following approaches can be used to adequately address cumulative impacts:

- Regional Growth Projections Method — A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency; or
- List Method — A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the lead agency.

For this PEIR, the list method is used primarily. However, regional trends such as traffic projections and population growth are used to describe the cumulative scenario for some resources.

Consistent with CEQA, a two-step approach was used to analyze cumulative impacts. The first step was to determine whether the combined effects from the proposed project and related projects would be cumulatively significant. This was done by adding the proposed project's incremental impact to the anticipated impacts of other probable future projects and/or reasonably foreseeable development. Where the combined effect of the projects and/or projected

development was determined to result in a significant cumulative effect, the second step was to evaluate whether the proposed project's incremental contribution to the combined significant cumulative impact would be cumulatively considerable, as required by CEQA Guidelines Section 15130, subdivision (a).

CEQA Guidelines Section 15064, subdivision (h)(4) states that

> *"[t]he mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable."*

Therefore, it is not necessarily true that, even where cumulative impacts are significant, any level of incremental contribution must be deemed cumulatively considerable by the lead agency. If the proposed project's individual impact is less than significant, however, its contribution to a significant cumulative impact could also be deemed cumulatively considerable, depending on the nature of the impact and the existing environmental setting. If, for example, a project is located in an air basin determined to be in extreme or severe nonattainment for a particular criteria pollutant, a project's relatively small contribution of the same pollutant could be found to be cumulatively considerable. Thus, depending on the circumstances, an impact that is less than significant when considered individually may still be cumulatively considerable in light of the impact caused by all projects considered in the analysis.

5.4.2 List of Related Projects in the Vicinity

A summary of the cumulative projects considered is provided in **Table 5-2** and shown in **Figure 5-1**. This is not intended to be an all-inclusive list of projects in the region, but rather a list of projects in the vicinity of the project site that may have some related environmental impacts to the proposed project and are: (1) recently completed; (2) currently under construction or implementation or beginning construction or implementation; (3) proposed and under environmental review; or (4) reasonably foreseeable.

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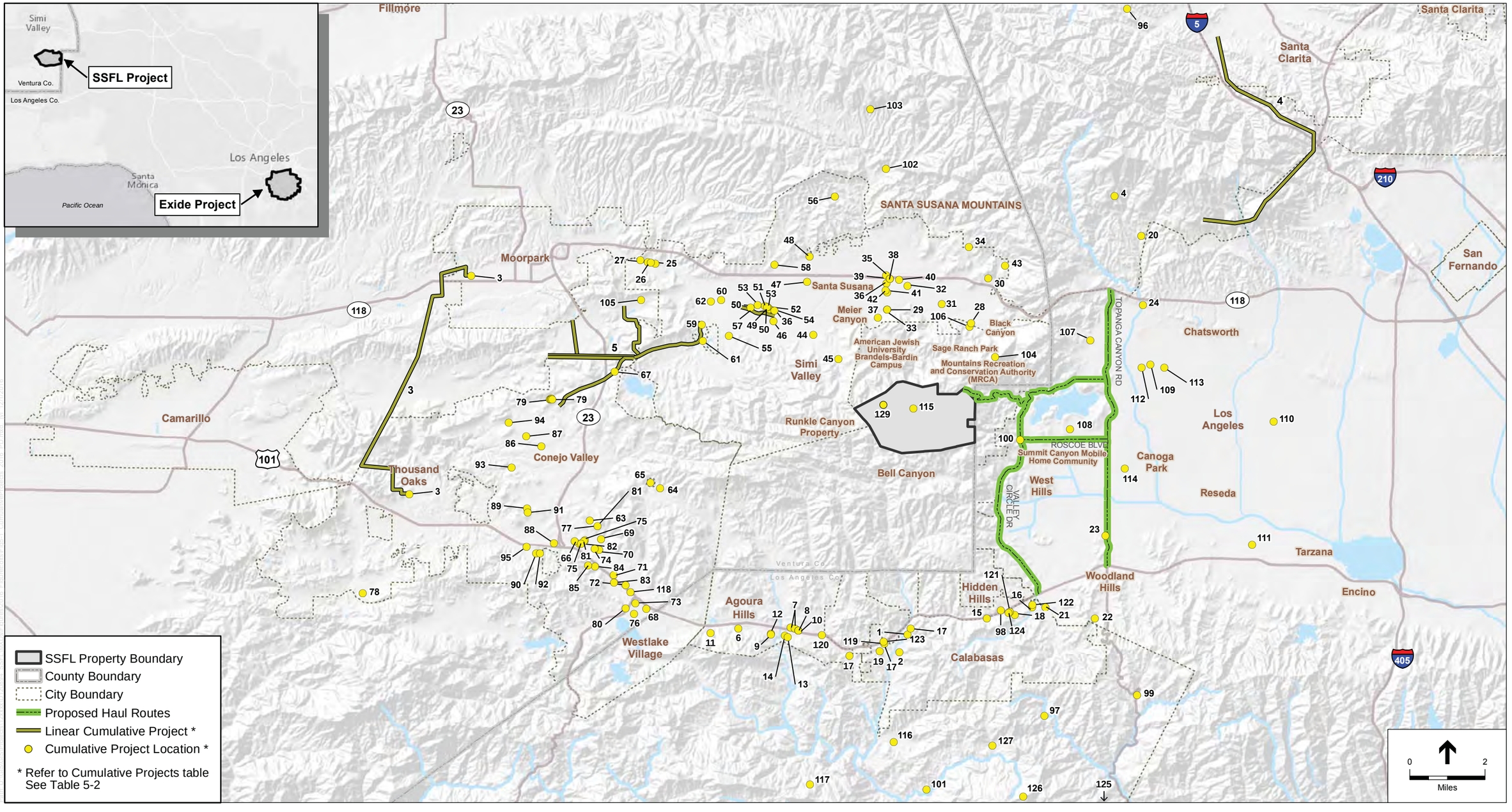

Source: ESA 2016

Santa Susana Field Laboratory.120894

Figure 5-1

Cumulative Projects Figure

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TABLE 5-2
LIST OF PROJECTS LOCATED AT OR WITHIN THE VICINITY OF THE PROPOSED PROJECT

Map Key Number	Project Name	Description of Project	Project Location	Jurisdiction	Distance from SSFL (miles)	Implementation Status
1	Canyon Oaks Hotel	New hotel 120 rooms	4790 Las Virgenes Road	City of Calabasas	4.8 miles south	Application processing
2	Paxton Townhome Project	Multi-family apartments – 78 units	4240 Las Virgenes Road	City of Calabasas	5.3 miles south	Under construction
3	Moorpark-Newbury Subtransmission Line	Construction or rebuild of approximately 8 miles of 66kV subtransmission line using tubular steel poles between the communities of Moorpark and Newbury Park	Between SR 118 and US 101 west of SR 23, in of Moorpark and Thousand Oaks, and unincorporated Ventura County	California Public Utilities Commission (CPUC)	10.8 miles west	Under construction
4	Southern California Gas Company Aliso Canyon Turbine Replacement Project	Removal from service of existing gas turbine-driven compressor and replaced with three variable frequency compression trains installed in a new compressor station. Other onsite and offsite associated facilities will be upgraded	Aliso Canyon natural gas storage field in unincorporated Los Angeles County and the city of Los Angeles	CPUC	6.5 miles northeast	Construction complete
5	Presidential Substation Project	Upgrade transformers at several electrical substations in the area and construct subtransmission lines in unincorporated Ventura County and Thousand Oaks	Madera Road and Country Club Drive, Simi Valley	CPUC	5 miles northwest	Construction has not commenced
6	APB Properties, LLC	Five empty lots and one developed lot on 4.18 acres	27489 Agoura Road	City of Agoura Hills	6.2 miles south	Approved
7	Shirvanian Family Investment Industrial Park	Industrial park with seven buildings	Lots between 28700 and 28811 Canwood Street	City of Agoura Hills	5.4 miles southwest	Approved
8	Ware Malcomb for Agoura Business Center West	A GPA app. To change project site from Bus. Manufacturing to Commercial Retail and a CUP app. to construct three retail buildings	Northwest corner of Canwood Street and Derry Ave.	City of Agoura Hills	5.4 miles southwest	Approved
9	The AVE Project Mixed-Use Development	Mixed-use development	SEC of Agoura and Kanan Road	City of Agoura Hills	5.8 miles southwest	Environmental Review MND

Map Key Number	Project Name	Description of Project	Project Location	Jurisdiction	Distance from SSFL (miles)	Implementation Status
10	Ware Malcomb for Agoura Business Center West	Mixed-use and live/work project	Northwest corner of Canwood Street and Derry Avenue	City of Agoura Hills	5.4 miles southwest	Approved
11	Healthcote for Buckley Commercial/Medial Building	Commercial/medical building	APN 2061-001-031	City of Agoura Hills	6.7 miles southwest	Review, TBD
12	Agoura-Kanan, LLC/The Martin Group/Symphony Development Mixed-Use Project	First phase of development & parcelization of site includes 107 residential units, and 62,000 square foot of retail space	4995 Kanan Road	City of Agoura Hills	5.8 miles southwest	Review, TBD
13	Utopia Hills by Alon Zakoot Mixed-Use Project	Mixed use and live/work project	APN 2061-029-003	City of Agoura Hills	5.7 miles southwest	Review, TBD
14	Cornerstone Coast to Coast Mixed-Use Project	Mixed-use development	APNs 2061-029-008 through 16 2061-030-001 through 013	City of Agoura Hills	5.6 miles southwest	Review, TBD
15	Malamut Vintage Auto Retail Project	Retail (auto sales)	24439 Calabasas Road	City of Calabasas	4.6 miles southeast	No activity
16	Avanti Condominiums & Mixed Use Project	Multi-family condo with street retail - 80 units	23500 Park Sorrento	City of Calabasas	4.7 miles southeast	Under construction
17	Rondell Oasis Hotel Project	Hotel - 127 rooms	APNs 2069-031-014 and 15	City of Calabasas	4.7 miles southeast	Entitlements granted
18	Hilton Garden Inn Expansion Project	Hotel expansion - 51 rooms	24150 Park Sorrento	City of Calabasas	4.7 miles southeast	Entitlements granted
19	MGA Mixed-Use Campus Project	MGA relocating corporate headquarters, including 700 rental housing units, ancillary office space, running track, amphitheater	26901 Malibu Hills Road	City of Los Angeles	5.3 miles east	Under construction

Map Key Number	Project Name	Description of Project	Project Location	Jurisdiction	Distance from SSFL (miles)	Implementation Status
20	Hidden Creeks Estates	188 single-family dwelling units with equestrian boarding facility	12100 Browns Canyon Road	City of Los Angeles	6.2 miles northeast	Tract map is pending, anticipated final decision in 2015
21	Motion Picture & Television Fund Retirement Home Project	Conditional Use and Zone Variance to allow construction of 191,500 square feet of new medical use. Construction of 285,070 square feet of residential retirement facilities with a net increase of 269 new units. Construction of 60,500 square feet of new services/ administrative buildings, 21,000 square feet of new activity/recreational facilities	23450 Calabasas Road	City of Los Angeles	4.8 miles southeast	FEIR
22	Vesting Tentative Tract Residential Project	Development of 37 detached single-family homes	22255 Mulholland Drive, Woodland Hills	City of Los Angeles	5.7 miles southeast	FEIR
23	The Village at Westfield Topanga Project	Phased development of 444,744 square feet of shopping center uses	6133 Topanga Canyon Boulevard, Woodland Hills	City of Los Angeles	4.3 miles northeast	FEIR
24	Sierra Canyon Secondary School Project	Three-story, 75,000 square foot building property in the A1-1K zone, as an expansion of, and adjacent to, church and private school (grades K-12) on a separate parcel east of Shoshone Avenue	11047 North De Soto Avenue, Chatsworth	City of Los Angeles	5.1 miles northeast	FEIR
25	Larry Ready Construction Storage Yard	Contractor storage yard and recreational vehicle storage yard	890 and 900 West Los Angeles Avenue	City of Simi Valley	7 miles northwest	Under construction
26	West Simi Business Center	167,417 square foot multi-tenant industrial park	903 Quimisa Drive	City of Simi Valley	6.6 miles northwest	Approved, unbuilt
27	Donley RV Storage Lot	Recreational vehicle storage lot, including recreational vehicle retail part sales, rental, and repair service uses	North side of Los Angeles Avenue, approximately 1,300 feet east of Quimisa Avenue	City of Simi Valley	6.7 miles northwest	Approved, unbuilt
28	Katherine Road South Apartment Complex	31-unit apartment complex including five single-story buildings, a single-story manager's unit, and a common building	1384 Katherine Road South	City of Simi Valley	1.7 miles north	Plancheck
29	Kuehner Apartments	Six-unit apartment complex	Northwest corner of Tapo Street and Ish Drive	City of Simi Valley	2 miles north	Plancheck

Map Key Number	Project Name	Description of Project	Project Location	Jurisdiction	Distance from SSFL (miles)	Implementation Status
30	Savannah Condominiums	66 condominiums	2461 Kuehner Drive, Simi Valley	City of Simi Valley	3 miles north	Plancheck
31	Humkar Townhomes	16 townhomes	5496 East Los Angeles Avenue	City of Simi Valley	2.1 miles northwest	Approved, unbuilt
32	Cochran Apartments	50-unit senior apartment complex	4862 East Cochran Street	City of Simi Valley	2.5 miles northwest	Approved, unbuilt
33	Landmark at Tapo/Ish Residential Project	Single-family residence on each of three existing lots	Southwest corner of Tapo Street and Ish Drive	City of Simi Valley	2 miles northwest	Approved, unbuilt
34	Chumash Park Project	Community park	Flanagan Drive and Yosemite Avenue, Simi Valley	City of Simi Valley	3.7 miles north	Approved, unbuilt
35	Clinicas del Camino Real	11,052 square foot one-story medical facility	4370 Eve Road	City of Simi Valley	2.9 miles northwest	Under construction
36	Express Car Wash	Two-lot subdivision; 2,035 square foot self-service car wash	2401 Tapo Street	City of Simi Valley	2.6 miles northwest	Application denied and under appeal
37	Guardian Street Office Building	54,311 square foot three-story office building and parking lot	4180 Guardian Street	City of Simi Valley	1.8 miles northwest	Complete application
38	Apricot Apartments	10-unit affordable apartment complex	4453 Apricot Road	City of Simi Valley	2.8 miles northwest	Approved, unbuilt
39	Apricot Development	Seven townhomes	4453 Apricot Road	City of Simi Valley	2.8 miles northwest	Approved, unbuilt
40	Apricot Road - JMA	Three-unit apartment complex	4424 Apricot Road	City of Simi Valley	2.7 miles northwest	Under construction
41	The Market Place	72 townhomes, 36 senior condominiums, and a commercial building	2225 and 2245 Tapo Street	City of Simi Valley	2.5 miles northwest	Under construction
42	Arroyo Simi Greenway	Recreational trail and associated improvements along the Arroyo Simi	Along the Arroyo Simi, from the west end of the City to the east end	City of Simi Valley	4 miles northwest	Approved, unbuilt
43	Hummingbird Nest Ranch	Convert existing equestrian and residential facilities and construct new facilities. Planned uses include hotel, equestrian center, conference center, pool, etc.	2940 Kuehner Drive,	City of Simi Valley	3.4 miles north	Permitting complete, under construction

Map Key Number	Project Name	Description of Project	Project Location	Jurisdiction	Distance from SSFL (miles)	Implementation Status
44	Archangel Michael Coptic Orthodox Church	500-seat sanctuary, multipurpose room, day care center, guest house, and convert existing church to senior center	1122 Appleton Road	City of Simi Valley	2.2 miles northwest	Plan check
45	Runkle Canyon Residential Project	298 single-family homes, 25 custom homes, and 138 senior condominiums	Southern terminus of Sequoia Avenue	City of Simi Valley	1.4 miles west	Under construction
46	7-Eleven Market	Demolish an existing gas station and construct a food mart with gas station	1369 Erringer Road	City of Simi Valley	3.2 miles northwest	Under construction
47	Hampton Inn	Three-story 103 room hotel	2585 Cochran Street	City of Simi Valley	3.6 miles northwest	Permitting complete, construction to begin in 2016
48	Simi Valley Hospital ER Expansion	17,100 square foot addition	2975 Sycamore Drive	City of Simi Valley	4.1 miles northwest	Under construction
49	River Run	40 townhomes	1748 Heywood Street	City of Simi Valley	3.5 miles northwest	Approved, unbuilt
50	1744 Patricia Avenue	Four townhomes	1744 Patricia Avenue	City of Simi Valley	3.6 miles northwest	Approved, unbuilt
51	1762 Patricia Avenue	Six-unit apartment complex	1762 Patricia Avenue	City of Simi Valley	3.5 miles northwest	Approved, unbuilt
52	Azad Group	Three townhomes	Northeast corner of Patricia Avenue and Galt Street	City of Simi Valley	3.6 miles northwest	Approved, unbuilt
53	Jarel Enterprises Inc.	12-unit condominiums	1525 Patricia Avenue	City of Simi Valley	3.8 miles northwest	Plancheck
54	City Ventures	62 townhome condominiums	Southwest corner of Erringer Road andHeywood Street	City of Simi Valley	3.4 miles northwest	Complete application
55	Huppert	Five single-family residences	1055 Fourth Street	City of Simi Valley	3.9 miles northwest	Approved, unbuilt
56	Lost Canyons	Master planned development to grade for 364 single-family lots, infrastructure streets, common area improvements, etc.	3301 Lost Canyons Drive	City of Simi Valley	5.2 miles northwest	Approved, unbuilt
57	Sage View Apartments	Eight-unit apartment complex	1378 Patricia Avenue	City of Simi Valley	3.8 miles northwest	Under construction

Map Key Number	Project Name	Description of Project	Project Location	Jurisdiction	Distance from SSFL (miles)	Implementation Status
58	Simi Homes	Four homes on existing lots	Big Sky Place and Erringer Road	City of Simi Valley	4.4 miles northwest	Approved, unbuilt
59	Centre Court	Convert a soccer field in an existing retail center to a one-story, 10,600 square foot retail building	1308 Madera Road	City of Simi Valley	4.6 miles northwest	Approved, unbuilt
60	Medical Office Building	25,000 square foot, three-story medical office building	525 East Los Angeles Avenue	City of Simi Valley	4.6 miles northwest	Approved, unbuilt
61	Sinaloa Park	Community park facility with miniature golf and associated uses	980 Madera Road	City of Simi Valley	4.4 miles northwest	Approved, unbuilt
62	Simi-37	37 multi-family townhomes	Southeast corner of Los Angeles Avenue and Simi Village Drive	City of Simi Valley	4.8 miles northwest	Approved, unbuilt
63	Erbes Road	20,000 square foot sanctuary, church, office, and classroom buildings; encroach into the protected zone of 5 oak trees	750 Erbes Road	City of Thousand Oaks	7.6 miles southwest	Approved
64	Kanan Road	Three single-family homes; encroach within the protected zones of four oak trees	Northwest corner of Kanan Road and Rayburn Street	City of Thousand Oaks	5.6 miles southwest	Under construction
65	Upper Ranch	13 single-family dwellings; remove 6 oaks; encroach into the protected zone of five oaks and landmark tree, prune five oaks and two landmark trees	2000 Upper Ranch Road	City of Thousand Oaks	5.8 miles southwest	Approved
66	Erbes Road and Thousand Oaks Boulevard	One lot subdivision of .74 acres; construct eight townhome units	E side Erbes Road, 750' north of Thousand Oaks Boulevard	City of Thousand Oaks	8.2 miles west	Approved
67	Olsen Road	Divide 42.8 acres into eight lots; construct six single-family detached dwellings	Olsen Road east of the SR 23	City of Thousand Oaks	6.4 miles west	Approved
68	Townsgate Road	482,000 square foot phased commercial complex consisting of seven office buildings, restaurant, parking structure, senior assisted living and skilled nursing facility	3059 Townsgate Road	City of Thousand Oaks	7.6 miles southwest	Under construction
69	Hillcrest Drive	Divide 12.42 acres into 10 lots; construct eight single-family dwellings	Northeast corner of Hillcrest Drive & Conejo School Road	City of Thousand Oaks	7.6 miles southwest	Under construction
70	Chiquita Lane	Three-unit apartment complex	2423 Chiquita Lane	City of Thousand Oaks	7.8 miles southwest	Approved

Map Key Number	Project Name	Description of Project	Project Location	Jurisdiction	Distance from SSFL (miles)	Implementation Status
71	Sunset Drive	Four detached townhouse units; divide 0.5 ac. into condominium lot	134 Sunset Drive	City of Thousand Oaks	7.8 miles southwest	Approved
72	Auto Mall Drive	Demolish dealership and construct a Lexus dealership; site improvements	3735 Auto Mall Drive	City of Thousand Oaks	7.7 miles southwest	Under construction
73	South Westlake	Five-story wing and three-story parking structure at the Hyatt Westlake; remove one oak tree and encroach into the protected zone of five oak trees	880 South Westlake Boulevard	City of Thousand Oaks	7.7 miles southwest	Approved
74	Conejo School and Chiquita	Divide 0.98 acre; construct 13 townhomes	Northeast corner Conejo School Road & Chiquita Lane	City of Thousand Oaks	7.9 miles southwest	Approved
75	Los Feliz Drive	45-unit apartment complex, remove oak tree; encroach into the protected zone oak tree, allow a lot manager	1815 & 1825 Los Feliz Drive	City of Thousand Oaks	8 miles southwest	Approved
76	Agoura and Westlake	Renovate exterior, construct building addition and two new buildings, change parking and landscaping at shopping center	2725-2785 Agoura Road & 924-1024 South Westlake Boulevard	City of Thousand Oaks	7.9 miles southwest	Under construction
77	Lone Oak	Subdivide 12.52 acres into 6 lots of record consisting of 5 residential lots and 1 open space lot	600 Lone Oak Drive	City of Thousand Oaks	7.5 miles southwest	Pre-application
78	Banyan Park	Community Park on 145 acres consisting of 17 acres of amenities, open space, and interconnecting multi-use trails	Banyan Park on Meadowcrest Street	City of Thousand Oaks	14 miles southwest	Pending
79	Calle Contento	Reconfigure five recorded lots into four single-family detached dwellings	730, 742, 766, 778 & 786 Calle Contento	City of Thousand Oaks	8 miles west	Phased construction
80	South Westlake Boulevard	6,000 square foot retail/restaurant addition, remove two landmark trees, and encroach into the protected zone of 11 landmark trees	971 and 973 South Westlake Boulevard	City of Thousand Oaks	8 miles southwest	Approved
81	E Thousand Oaks	Three-story 36 unit apartment, remove three oak trees and one landmark tree, encroach into the protected zone of five oak trees, and prune of four oak trees	1475 East Thousand Oaks Boulevard	City of Thousand Oaks	8.2 miles southwest	Approved
82	1735 Los Feliz Drive	Seven townhomes	1735 Los Feliz Drive	City of Thousand Oaks	8.1 miles southwest	Approved
83	3500 Willow Lane	98,200 square foot office and self-storage facility; encroach into the protected zone of six oak trees	3500 Willow Lane	City of Thousand Oaks	7.9 miles southwest	Under construction

Map Key Number	Project Name	Description of Project	Project Location	Jurisdiction	Distance from SSFL (miles)	Implementation Status
84	2650 Willow Lane	Industrial building; remove one and transplant four oak trees	2650 Willow Lane	City of Thousand Oaks	8.1 miles southwest	Pending
85	Willow and Conejo Ridge	8,000 square foot industrial building; remove three oak trees and one toyon tree	SE of Willow Lane on Conejo Ridge Road	City of Thousand Oaks	8.2 miles southwest	Pending
86	Arcturus Street	Four homes, remove one oak tree; encroach into the protected zone of two landmark trees	390 Arcturus Street	City of Thousand Oaks	8.4 miles southwest	Approved
87	One West Avenida	15,800 square foot fellowship hall with classrooms at Holy Trinity Lutheran Church	One West Avenida de Los Arboles	City of Thousand Oaks	8.8 miles southwest	Approved
88	Pierce and Jensen	Four-unit apartment building; encroach into the protected zone of two oak trees	Northeast corner of Pierce and Jensen Courts	City of Thousand Oaks	8.8 miles southwest	Approved
89	Mayflower Street	20 single-family dwellings and encroach into protected zones of four oak trees; additional export of 16,000 CY	Southwest corner of Mayflower Street & Warwick Avenue	City of Thousand Oaks	9.1 miles southwest	Under construction
90	Rolling Oaks	14 units; encroach into the protected zone of eight oak trees	300 East Rolling Oaks Drive	City of Thousand Oaks	9.3 miles southwest	Approved
91	Warwick Avenue	23 townhomes	950 Warwick Avenue	City of Thousand Oaks	9.1 miles southwest	Approved
92	400 Rolling Oaks	79-unit assisted living facility	400 Rolling Oaks Drive	City of Thousand Oaks	9.2 miles southwest	Pre-application
93	Janss Road	189,499 square foot four-story building wing; construct new multi-level parking structure; remove two oak trees and encroach into the protected zone of three oak trees	215 West Janss Road	City of Thousand Oaks	9.3 miles southwest	Approved
94	Olsen and Morningstar	Seven single-family detached homes	Southwest corner of Olsen Road & Morningstar Avenue	City of Thousand Oaks	9.2 miles west	Under construction
95	55 East Rolling Oaks Medical Office Building	Demolish existing restaurant and construct two-story medical office building	55 East Rolling Oaks Drive	City of Thousand Oaks	9.5 miles southwest	Under construction
96	Thackery Lane Dormitories	Dormitories total 22,157 square feet	26412 Thackery Lane, Stevenson Ranch	County of Los Angeles	11 miles southeast	Approved
97	Old Topanga Canyon Road Learning Center	Demolition of a two-story building and construction of a two-story learning center in the same location and installation of a fire access road; installation of two modular classrooms and toilet structures	1717 Old Topanga Canyon Road	County of Los Angeles	7.5 miles southeast	Approved plans distributed

Map Key Number	Project Name	Description of Project	Project Location	Jurisdiction	Distance from SSFL (miles)	Implementation Status
98	24141 Ventura Boulevard	Assisted living facility 140 units and 160 beds	24141 Ventura Boulevard	County of Los Angeles	4.5 miles southeast	Additional information received
99	North Topanga Canyon	CUP for new residence to be used as a bed and breakfast; variance for the ridgeline encroachment; 264.9 CY export	1832 N Topanga Canyon Boulevard	County of Los Angeles	8 miles southeast	EIR review
100	Sterling Properties	150 single-family homes on 64.2 acres	West of the intersection of Roscoe Boulevard and Valley Circle Boulevard in West Hills	County of Los Angeles	1.2 miles east	Under review by County
101	Punto De Vista	Malibu Local Coastal Plan: 6 (Residential I) (11 dwelling units per acre) Zone: R-1-20,000 (Single Family Residence) (Minimum lot size 20,000 sf)	25734 Punto De Vista Drive, Calabasas	County of Los Angeles	9 miles south	Application received
102	Conejo Valley Archery Range	Three-acre archery range with associated 165-space gravel parking lot	4651 Tapo Canyon	County of Los Angeles	7.5 miles north	
103	Innex Oil and Gas Exploration	Drill 12 oil and gas exploratory wells, three oil stock tanks, flow treater, water tank, transfer pump, and containment berm around the tank	5 miles north of SR 118 and Tapo Canyon Road intersection	County of Ventura	7.3 miles north	Application in process
104	Fishback Waste Cleanup	Removal of 100,000 CY of construction debris and other materials	Parcels 2821-002-023, 2821-002-025, 2821-009-030, and 2821-009-031	County of Ventura	1.2 miles north	Remediation plan required by County
105	Butler Ranch Zone Change and Tentative Tract Map Project	Zone change for 24 lots for residential development, ranging from 20.04 acres to 24.85 acres in size	1313 Tierra Rejada Road	Ventura County Planning Division	6.4 miles northwest	EIR being prepared. The proposed project does not include a buildout of the proposed lots at this time
106	Colton Lee Manufactured Housing Community	Development of up to 60 dwelling units	Corner of Katherine Road and Peppertree Lane West	Ventura County Planning Division	1.6 miles northeast	Final EIR published December 2012
107	Chatsworth Park South Remedial Action Plan	Permanently cap soil with lead and polycyclic aromatic hydrocarbons resulting from former firing range	22360 West Devonshire Street	Department of Recreation and Parks/DTSC	3.5 miles northeast	Public comment period ended in 2013. Park closed, construction has not yet begun

Map Key Number	Project Name	Description of Project	Project Location	Jurisdiction	Distance from SSFL (miles)	Implementation Status
108	Raytheon Systems Co	Remediation of hazardous waste storage area and a 4,000-gallon waste oil tank	8433 Fallbrook Avenue, Canoga Park	DTSC	2.5 miles southeast	Active
109	Ultra Circuits, Inc.	Remediation project - VOC, methyl isobutyl ketone, chrome, heavy metals, etc. in aquifer, indoor air, soil, and soil vapor from previous manufacturing and machine shop onsite	20751 Marilla Street, Chatsworth	DTSC	4.8 miles northeast	Certified O&M Land Use Restrictions Only
110	MJ Plating Industrial Building	Cleanup of PCE in soil, as well as trichloroethylene; drilling, sampling, and installation of soil borings and vapor probes will be required	18141 Napa Street Northridge	DTSC	8 miles east	Active
111	Former Bodycote Facility	Cleanup on parcel with chlorinated solvents and benzene from metal manufacturing; groundwater impacted	18600 Oxnard Street, Tarzana	DTSC	7.9 miles southeast	In review
112	New Hampshire Ball Bearing	Soil and groundwater VOC-contamination	9730 Independence Avenue Chatsworth	DTSC	4.5 miles east	Active
113	Proodos Properties, Inc.	Soil and soil vapor under investigation	9737 Mason Avenue, Chatsworth	DTSC	5.1 miles east	Active
114	The Marquardt Co	Previously, manufacturing and testing of aerospace occurred resulting in lead and arsenic contaminants. Soil and soil vapor extraction implemented; groundwater contaminated	16555 Saticoy Street, Van Nuys	DTSC	4.1 miles east	Undergoing closure
115	NASA Demolition at SSFL	Demolition of various structures on SSFL	SSFL	DTSC	project site	Undergoing demolition
116	Santa Monica Mountains National Recreation Area, Visitor Center at King Gillette Ranch	The National Park Service, California State Parks, the Santa Monica Mountains Conservancy, and the Mountains Recreation and Conservation Authority are preparing a Design Concept Plan for King Gillette Ranch in the Santa Monica Mountains	Santa Monica Mountains National Recreation Area	National Park Service	7.7 miles south	Joint NEPA/CEQA environmental assessment/initial study being prepared.

Map Key Number	Project Name	Description of Project	Project Location	Jurisdiction	Distance from SSFL (miles)	Implementation Status
117	Santa Monica Mountains National Recreation Area (SMMNRA) Interagency Trail Management Plan	Trail Management Plan to establish the overall vision for future development and management of the nearly 500-mile SMMNRA trail network. The TMP will prescribe a comprehensive plan for circulation, access, and allowable trail uses for trails throughout the national recreation area	Santa Monica Mountains National Recreation Area	National Park Service	9.2 miles south	Scoping complete
118	US-101/SR-23 Interchange Improvement Project	Add a lane to the southbound SR-23 / northbound US 101 connector. Construct sound walls along US 101 at various locations. Add a lane to the northbound and southbound US 101 at various locations. Widen three bridges. Realign Moorpark Road northbound on-ramp and add a lane to the Moorpark Road northbound off-ramp	US-101/SR-23 Interchange	Caltrans	7.7 miles southwest	Construction expected be to complete in early 2016
119	Lost Hills Road/US-101 Lost Hills Road Overcrossing Replacement & Interchange Modification Project	Widen and replace the existing Lost Hills Road Overcrossing and modify the interchange includes the bridge and the on- and off-ramps located at US 101 / Lost Hills Road interchange	Lost Hills Road/US-101 Lost Hills Road Overcrossing	Caltrans	5.1 miles south	Under construction
120	US 101/Palo Comado Canyon Road Interchange Improvement Project	Improve existing US 101 / Palo Comado Canyon Road interchange including widening the Palo Comado Canyon Road and Palo Comado Canyon overcrossing over US 101 and modification of the interchange ramps	101/Palo Comado Canyon Road	Caltrans	5.3 miles south	EA and FONSI prepared in January 2012
121	Westin Hotel	176 room full service hotel	24400 Calabasas Road	City of Calabasas	5.5 miles south	Application
122	Nissan Car Dealership	227,000 commercial use, 648 parking spaces	24460 Calabasas Road	City of Calabasas	5.5 miles south	Application
123	Lost Hills Interchange Improvements	Bridge widening and new on/off ramps	US 101 at Lost Hills	City of Calabasas	5.5 miles south	Under construction
124	Senior Housing, Mixed Use	42 condominium units, 2,000 square foot commercial uses	23480 Park Sorrento	City of Calabasas	5.5 miles south	Application
125	New SFR with Detached Garage	Single family residence; proximity to H1 habitat	20483 Medley Lane	County of Los Angeles	10 miles south	Completed

Map Key Number	Project Name	Description of Project	Project Location	Jurisdiction	Distance from SSFL (miles)	Implementation Status
126	Slope Restoration	Slope restoration; proximity to H2 habitat	23233 Saddle Peak	County of Los Angeles	9 miles south	Completed
127	New Large Addition to Existing Home	Addition to existing home; proximity to H1 habitat	2189 Stunt Road	County of Los Angeles	8 miles south	Completed
128	Exide Remediation Project	Clean up residential properties, including schools, daycare centers, and parks with the highest concentration of lead in the soil and greatest potential for exposure	2700 South Indiana Street, Vernon	DTSC	30 miles	Final EIR in preparation
129	Boeing Area IV Building Demolition	Demolition of five inactive buildings in Area IV	SSFL– Area IV	DTSC	on project site	Planning

5.5 Analysis of Cumulative Impacts

As described in Section 5.2, the cumulative scenario under each environmental discipline differs depending upon the potential area of effect. For example, the cumulative conditions for regional air quality account for impacts within the entire air basin because air quality impacts occur on a regional scale, while the cumulative impacts for biology would be limited to a more local scale for activities in the vicinity of the project site. The cumulative setting and analysis for each discipline are discussed in the following pages.

5.5.1 Aesthetics

The geographic scope for potential cumulative impacts to aesthetics includes the foreground, which is defined as the zone within 0.25 to 0.5 mile from the project site, and the middleground, which is a zone that extends from the foreground up to 3 to 5 miles. However, only projects that are located within the foreground and/or on ridgelines throughout the middleground are included in this analysis. The geographic scope was chosen because the proposed project and associated activities can be most prominent at these distances. In mountainous areas, such as the vicinity of the proposed project, landscape detail is typically most noticeable and objects generally appear most prominent when seen in the foreground. At middleground viewing distances, the texture of landscape features, such as of rock outcropping surfaces and vegetation as well as built elements, may be noticeable but are increasingly unrecognizable. However, at background viewing distances, which would extend from about 3 to 5 miles from the project site to infinity, visible detail is limited to landscape patterns or visual contrast and views of the project site are generally non-existent.

As described in Section 5.3, *Temporal Scope*, this cumulative impact analysis considers other projects that have been recently completed, are currently under construction, or are reasonably foreseeable.

As described in Section 4.1, *Aesthetics*, of this PEIR, the project site occupies approximately 2,850 acres with elevations ranging from about 1,175 feet AMSL along the south to 2,245 feet AMSL to the north near the crest of the Simi Hills. The predominant land use in the surrounding area consists of large-scale suburban tract-housing developments interspersed with undeveloped open space. Developed land uses within the project site include roads, buildings, and other infrastructure associated with its past use as a scientific research and test facility. Portions of the project site are composed of areas of open space, much of which remains in an undisturbed natural condition.

Land uses immediately adjacent to the project site include open space in the form of public and private land and residential areas. San Fernando Valley communities, including Canoga Park and Chatsworth, are located to the east. The southern portion of the project site contains undeveloped lands, which abut the northern edge of the residential community of Bell Canyon. Public viewpoints near the project site include views from surrounding ridgelines and trails, such as the Sage Ranch Loop Trail, Cheeseboro Ridge Trail, and Albertson Fire Road, as well as trails maintained by the Bell Canyon community. The most prominent is the Sage Ranch Loop Trail,

located immediately adjacent to the northeast corner of the project site and commonly used by recreational visitors for its scenic views. The Sage Ranch Loop Trail follows the northern boundary of the project site.

Cumulative visual impacts could occur if development projects were constructed within the viewshed of the KOPs, substantially altering the visual character of the area or damaging views from sensitive aesthetic resources. Because of the limited visibility of the project site, however, there are only a few projects that would have the potential to combine with proposed project impacts to result in a cumulative impact on aesthetics. Cumulative projects would be limited to development projects on ridgelines that could be seen within the viewshed from KOPs, as well as other projects within the project boundary (see Table 5-1). The only projects within the project site are the NASA and Boeing demolition activities. Elements of these projects (such as infrastructure, vehicles, equipment, and personnel) would be visible to affected viewers in the geographic scope. Specifically, the NASA and Boeing demolition activities would occur within the SSFL project site within the same time as the proposed project; however, similar to the analysis for the proposed project, the NASA and Boeing demolition activities would not degrade the existing visual character or quality of either the site or its surroundings and would ultimately increase the visual quality at the site once complete (see Impacts 4.1-1 through 4.1-3 in Section 4.1, *Aesthetics*). In addition, depending on the project element and viewing location, mitigating landscape elements, and other factors (such as the presence of vegetation and topography), screening could minimize the actual visibility. In addition, each of the cumulative projects is also relatively distant from the other such that the projects would not be within the same viewshed for any individual viewer. Therefore, impacts of these cumulative projects would not combine with impacts of the proposed project to result in a significant impact to aesthetics.

When added to the cumulative scenario described above, the effects of the proposed project would contribute incrementally to the cumulative impacts on aesthetics. The proposed project would alter the visual quality of the project site; however, the changes would be beneficial, as it would replace existing contrasting buildings with vegetation consistent with existing vegetation in the surrounding landscape. Impacts during cleanup activities would be similar to the visual character of the existing project site, as it contains construction equipment and vehicles; therefore, the introduction of construction equipment and materials to complete cleanup activities would not result in a significant impact to aesthetics. In addition, with implementation of the proposed project, the site would become more harmonious with the rest of the landscape, increasing the visual quality of the area and views from the KOPs; thus, impacts would be less than significant. Therefore, when considered in addition to the anticipated impacts of other projects in the cumulative scenario, the proposed project's incremental contribution to aesthetics impacts would not be cumulatively considerable (less than significant).

Mitigation

No mitigation measure is required.

Significance after Mitigation

The project, in combination with related projects, would not contribute considerably to aesthetics impacts. Therefore, cumulative aesthetic impacts would not be cumulatively considerable (less than significant).

5.5.2 Air Quality

The geographic scope for regional air quality impacts consists of the air basin(s) in which project emissions would occur. Although onsite emissions would occur in the South Central Coast Air Basin (SCCAB), most offsite project emissions would occur in the South Coast Air Basin (SCAB), with emissions due to long-range transportation possibly occurring in MDAB, SJVAB, SSAB, GBVAB, SACVAB, and NPAB. The project's unmitigated emissions are below regional mass emission thresholds in the SCCAB, SCAB, MDAB, SJVAB, SSAB, and SACVAB for all pollutants except NOx. Unmitigated emissions of all criteria pollutants are below applicable thresholds in GBVAB and NPAB. Therefore, in accordance with guidance from the air districts, the project would not contribute substantially to cumulative impacts for VOC/ROG, CO, PM_{10}, $PM_{2.5}$, and SO_2 in SCCAB, SCAB, MDAB, SJVAB, SSAB, and SACVAB, and would not contribute substantially to cumulative impacts for all criteria pollutants in the GBVAB and NPAB; impacts would be less than significant.

Subsequent to mitigation (Mitigation Measures AQ-1 and GHG-3), NOx emissions within the SCAB, MDAB, SJVAB, SSAB, and SACVAB are reduced to below regulatory standards and therefore would not contribute substantially to cumulative impacts for NOx and would be less than significant. However, emissions within the SCCAB still exceed the regulatory thresholds after mitigation. Because mitigated impacts are significant at the project level for NOx, a contributor to NO_2 and ozone, the cumulative impacts assessment will focus only on these pollutants in SSCAB.

The VCAPCD's approach for assessing cumulative impacts is based on attainment of ambient air quality standards in accordance with the requirements of the CAA and California Clean Air Act. As discussed earlier, the VCAPCD has developed a comprehensive plan, the Final 2007 AQMP, which address each region's cumulative air quality condition.

A significant impact may occur if a project would add a cumulatively considerable contribution of a federal or state non-attainment pollutant. Because the SSCAB is currently in nonattainment for ozone and PM_{10}, related projects could exceed an air quality standard or contribute to an existing or projected air quality exceedance. Cumulative impacts to air quality are evaluated under two sets of thresholds for CEQA and the VCAPCD. CEQA Guidelines Section 15064(h)(3) provides guidance in determining the significance of cumulative impacts, stating in part that:

> *A lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program which provides specific requirements that will avoid or substantially lessen the cumulative problem (e.g., water quality control plan, air quality plan, integrated waste management plan) within the geographic area in which the project is*

> *located. Such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency.*

For purposes of the cumulative air quality analysis with respect to CEQA Guidelines Section 15064(h)(3), the proposed project's incremental contribution to cumulative air quality impacts is determined based on compliance with the VCAPCD's adopted 2007 AQMP.

The proposed project would be consistent with the growth assumptions in the AQMP. Because the project is not a typical land-use project, the strategies identified in the AQMP for transportation and reduction of VMTs is not applicable. The project is therefore consistent with the growth projections in the applicable AQMP. However, the proposed project would conflict with the VCAPCD's AQMPs reduction strategies in that the project level emissions would exceed the regulatory thresholds for NO_X within each of the air basins. As discussed in detail under Impact 4.2-2a (see Section 4.2.5.2, *Air Quality Standards*), even with the implementation of mitigation, project emissions would not be reduced to below VCAPCD's thresholds. Project emissions exceed the thresholds and therefore have the potential to result in daily exceedances within the SCCAB. Therefore, project activities would conflict with the VCAPCD AQMP's goal of reducing regional pollutant emissions consistent with the SIP. Thus, given the project's inconsistency with the VCAPCD's Final 2007AQMP, the project's incremental contribution to cumulative air quality effects is cumulatively considerable, per CEQA Guidelines Section 15064(h)(3).

VCAPCD no longer recommends relying solely upon consistency with the AQMP as an appropriate methodology for assessing cumulative air quality impacts. Instead, the VCAPCD recommends that project-specific air quality impacts be used to determine the potential cumulative impacts to regional air quality.

In its 2003 guidance, the VCAPCD stated the following[1].

> *A project with emissions of two pounds per day or greater of ROC, or two pounds per day or greater of NOx that is found to be inconsistent with the AQMP will have a significant cumulative adverse air quality impact. A project with emissions below two pounds per day of ROC, and below two pounds per day of NOx, is not required to assess consistency with the AQMP.*
>
> *Inconsistent projects are usually those that cause the existing population to exceed the population forecasts contained in the most recently adopted AQMP. Chapter 4, Air Quality Management Plan Consistency, presents specific procedures for determining project consistency with the AQMP. Those procedures should be followed before making a final consistency determination for a project*

[1] VCAPCD. 2003. Ventura County Air Quality Assessment Guidelines. October. Available: http://www.vcapcd.org/environmental_review.htm.

Any General Plan Amendment or revision that would provide directly or indirectly for increased population growth above that forecasted in the most recently adopted AQMP will have a significant cumulative adverse air quality impact.

Proximity of the 128 related projects identified within the project vicinity is not relevant to the discussion of cumulative regional air pollutant impacts. The timing and sequencing of these related projects is not under the control of DTSC or known with any certainty. Thus, any quantitative analysis to ascertain daily cumulative emissions assuming multiple, concurrent construction projects would be entirely speculative. For this reason, as discussed above, the VCAPCD's methodology to assess a project's cumulative impact differs from the cumulative impacts methodologies employed elsewhere in this PEIR.

As discussed under impacts AQ-2 and AQ-4, project-related NOx emissions exceed the applicable VCAPCD thresholds for both the overall project and the initial projects prior to the implementation of mitigation (see **Table 5-3**). Subsequent to mitigation, NOx emissions within the SCCAB still exceed the regulatory thresholds. Therefore, the emissions of NOx in SCCAB would be cumulatively significant for NO_2 and O_3.

TABLE 5-3
MITIGATED CONSTRUCTION EMISSIONS

		Estimated Emissions (Pounds per Day)					
		ROC	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Unmitigated Emissions							
	Overall Clean-up Total	5	**102**	116	<1	32	18
	Long-term Monitoring and Maintenance Total	<1	<1	1	<1	<1	<1
VCAPCD	Initial Projects Total	5	**76**	98	<1	31	16
	Project-level Threshold	25	25	N/A	N/A	N/A	N/A
	Cumulative Threshold	2	**2**	N/A	N/A	N/A	N/A
	Significant	No	**Yes**	No	No	No	No
Mitigated Emissions							
	Overall Clean-up Total	4	**38**	113	<1	26	14
	Initial Projects Total	5	**30**	98	<1	18	9
VCAPCD	Project-level Threshold	25	25	NA	NA	NA	NA
	Cumulative Threshold	2	**2**	N/A	N/A	N/A	N/A
	Significant	No	**Yes**	No	No	No	No

SOURCE: ESA, 2017a (see Appendix D of this PEIR).

In accordance with VCAPCD guidance, the project would not have a cumulative impact with respect to growth forecasts within the AQMP. Additionally, while ROC emissions exceed two pounds per day,[2] the emissions of ROC do not exceed the daily regional thresholds (25 lbs/day) and therefore would not be inconsistent with the AQMP and not cumulatively considerable. However, because impacts from project-related emissions exceed 2 lbs/day for NOx and the project is inconsistent with the AQMP with respect to exceeding the daily regional threshold of 25 lbs/day for NOx, the project impacts are cumulatively considerable with respect to NOx and therefore the project would be cumulatively significant. Cumulative impacts within the SCCAB are significant and unavoidable.

With respect to potential odor impacts, neither the project nor any of the related projects (which are primarily institutional, general office, residential, retail, and restaurant uses) have a high potential to generate odor impacts. Furthermore, any related project that may have a potential to generate objectionable odors would be required by VCAPCD or SCAQMD to implement BACT to limit potential objectionable odor impacts to a less than significant level. Thus, potential odor impacts from the project and related projects are anticipated to be cumulatively less than significant.

Mitigation

Implement Mitigation Measures AQ-1 and GHG-3.

Significance after Mitigation

With implementation of mitigation measures, the project, in combination with related projects, could contribute considerably to air quality within the VCAB. Therefore, cumulative impacts to air quality within the VCAB could be cumulatively considerable (significant and unavoidable).

5.5.3 Biological Resources

The geographic scope for biological resources consists of the project site and surrounding lands, along with drainages that are connected to the project site, including those that run through Bell and Meier Canyons (Figure 5-1). The limits of the cumulative geographic scope were determined based on the presence of contiguous, open space habitat types as well as urban areas supporting, or capable of supporting, the sensitive biological resources potentially affected by the project. This cumulative setting is generally bound by the Santa Susana Mountains to the north, Santa Monica Mountains to the south, Conejo Valley to the west, and the Chatsworth area to the east. The general habitat types in the region consist of a mix of disturbed and relatively pristine natural landscape that supports a variety of biological communities comprising predominantly upland scrub interspersed with narrow riparian drainages and steep canyons.

The projects considered in this cumulative analysis have varying effects on biological resources in the geographic scope, ranging from potential direct adverse impacts on sensitive species and habitat (cumulative projects 46, 110, and 120), to beneficial impacts resulting from

[2] Within the VCAPCD, a project that has emissions greater than two pounds per day for ROC or NOx that are found to be inconsistent with the AQMP will also have a significant cumulative impact (VCAPCD, 2003).

implementation of conservation measures and land management practices. Several DTSC projects related to remediation of toxic substances (cumulative projects 109, 111, and 112) could contribute to adverse impacts to sensitive biological resources within the geographic scope. The construction of facilities on open space land (cumulative projects 20, 56, 77, 89, 102, 103,105, 110) as well as a large residential development project (the Runkle Canyon Residential project - cumulative project 45) within the geographic scope would remove large areas of native habitat. The Runkle Canyon Residential project, which is currently under construction, would impact 470 acres of habitat, including native plant communities such as coastal sage scrub, coast live oak woodland, and southern willow scrub (City of Simi Valley, 2012). Because this development project is being developed within and near naturalized areas and undisturbed habitats, its impacts to biological resources include removal and/or disturbance to water, riparian, or sensitive habitats protected by federal, state, or local regulations; removal and/or damage to special-status plants, including indigenous plants of biological and cultural significance; injuring, killing, harassing, or otherwise harming special-status wildlife; and disruption of wildlife movement.

However, these projects also have beneficial effects to biological resources. The projects related to remediation of toxic substances will reduce or remove contaminants from the native soil and groundwater and restore impacted habitats, thereby providing long-term beneficial effects to native habitats and wildlife. Additionally, the Runkle Canyon Residential project includes an open space preservation component that substantially exceeds the amount of impacted habitat—it is expected to preserve a total of 1,150 acres of open space habitat within the Runkle Canyon region. Because of the limited amount of development and activity proposed within the geographic scope of the overall site cleanup compared with the amount of undisturbed and available open space as well as the beneficial components of the aforementioned projects, the combined effects to biological resources from the cumulative projects list would not be considered cumulatively significant.

The effects of the proposed project, in combination with other cumulative projects in the geographic scope, would contribute incrementally to impacts on biological resources. As described in Section 4.3, *Biological Resources*, the project would have potentially significant impacts, including disturbance or removal of sensitive habitats (e.g., oak woodlands); removing or damaging special-status plants (i.e., Braunton's milk-vetch) or protected trees; injuring, killing, harassing, or otherwise harming special-status wildlife, including western spadefoot toad, coast horned lizard, and nesting birds and raptors; and potential effects to wildlife movement and/or a wildlife movement corridor. Project activities that might contribute to these impacts include soil sampling, grading, soil excavation and removal, building demolition and removal, groundwater monitoring and treatment, road improvements, and installation and decommissioning of wells, pipes, and infrastructure. Mitigation measures have been identified for the proposed project to avoid and/or minimize impacts to biological resources, including Mitigation Measures BIO-1 through BIO-23. Implementation of avoidance and minimization measures for the identified impacts to biological resources to ensure, at a minimum, no-net-loss of habitat would reduce some impacts to a less-than-significant level. However, known occurrences of Braunton's milk-vetch and Santa Susana tarplant have been recorded within the vicinity of a few cumulative projects (cumulative projects 46, 110, and 120) and could be removed or otherwise impacted. Therefore, when considered in addition to the anticipated impacts of other projects in the

cumulative scenario, the project's incremental contribution to impacts to biological resources could be cumulatively considerable (significant and unavoidable).

Mitigation

Implement Mitigation Measures BIO-1 through BIO-23.

Significance after Mitigation

With implementation of mitigation measures, the project, in combination with related projects, could contribute considerably to impacts to biological resources. Therefore, cumulative impacts to biological resources could be cumulatively considerable (significant and unavoidable).

5.5.4 Cultural Resources

The geographic scope of analysis for potential cumulative impacts to cultural resources includes the Simi Hills. This geographic scope of analysis is appropriate as the archaeological and paleontological resources within this area are expected to be similar to those that occur on the project site because of their proximity; similar environments, landforms, and hydrology would result in similar land-use and, thus, site types. Although their full geographic boundaries are currently undefined, the Simi Hills Archaeological District (District) and SSFL Traditional Cultural Property (TCP) likely comprise a large part of the geographic cumulative scoping area and, as such, there are undoubtedly many archaeological resources that contribute to the District, as well as archaeological resources, prehistoric rock art, topographic features and plants and animals that contribute to the SSFL TCP. Similar geology within this vicinity would likely yield fossils of similar sensitivity and quantity. This is a large enough area to encompass any effects of the project on cultural and paleontological resources that may combine with similar effects caused by other projects, and provides a reasonable context wherein cumulative actions could affect cultural and paleontological resources. The temporal scope for cumulative impacts to cultural resources encompasses both short-term and long-term cumulative impacts of the proposed project, in conjunction with other cumulative projects in the area. The project could cause impacts on cultural and paleontological resources throughout the 15-year life of the overall site cleanup.

As previously described, multiple related projects are proposed throughout the Simi Hills. Cumulative impacts to cultural resources in the Simi Hills could occur if other existing or proposed related projects, in conjunction with the proposed project, had or would have impacts on cultural resources that when considered together would be significant. The Simi Hills contain a significant archaeological and historical record that, in many cases, has not been well documented or recorded. Thus, there is potential for ongoing and future development projects in the vicinity to disturb landscapes that may contain known or unknown cultural resources. Many of these resources could provide information that would contribute to the understanding of regional research themes, and could qualify as historical resources or unique archaeological resources. While it is not possible, based on available data, to fully quantify how many cultural resources have been or could be impacted by past, present, and reasonably foreseeable projects, it is likely that the cumulative loss of cultural resources as a result of these projects could result in a loss of important information necessary to a full understanding of the regional history. In addition, past,

present, and reasonably foreseeable projects within the geographic scope of analysis could impact prehistoric and historic landscapes and resources of special importance to Native American groups. Direct impacts from past, present, and reasonably foreseeable projects in the geographic scope of analysis could, when taken together in combination, create a cumulatively significant impact on historical resources, unique archaeological resources, and tribal cultural resources.

Many of the cultural resources within the geographic scope have already been subjected to impacts as a result of past projects. Projects undertaken before environmental laws such as CEQA were in place may not have considered, or mitigated, significant impacts to cultural resources, and may have resulted in damage to important cultural resources, including resources that retain significant cultural value to Native American groups. Projects that have already been implemented or may occur in the foreseeable future at or near the project site could impact cultural resources. These projects may also bring additional people (e.g., work crews, residents, tourists) into the area, which may result in increased rates of vandalism or off-highway vehicle use that may directly or indirectly impact resources. These projects may also result in visual, auditory, and other environmental impacts that may adversely affect the SSFL TCP. For these reasons, the combined impacts on cultural resources in the geographic scope would be considered cumulatively significant.

When considered in combination with the impacts of other projects in the cumulative scenario, the project would contribute incrementally to impacts on cultural resources, including historical resources, unique archaeological resources, and tribal cultural resources. Mitigation Measures CUL-1 through CUL-16, which are described in detail in Section 4.4, *Cultural Resources*, together with Mitigation Measures BIO-2, BIO-5, BIO-12, and BIO-19, described in Section 4.3, *Biological Resources*, of this PEIR, would avoid, minimize, rectify, reduce, or compensate for the significance of the impacts to the degree feasible. However, they would not mitigate impacts below the level of significance and, thus, the only method to fully mitigate these impacts would be complete avoidance of any future project activity. Therefore, no feasible mitigation exists that would reduce the project's contribution to less than considerable. Impacts of the project would combine with impacts from past, present, and reasonably foreseeable projects, and the project's contribution toward cumulative effects on cultural resources would be cumulatively considerable.

Excavation activities associated with the project in conjunction with other projects in the area could contribute to the progressive loss of paleontological resources, such as fossil remains, as-yet unrecorded fossil sites, associated geological and geographic data, and fossil-bearing strata. However, in the event that paleontological resources are encountered, the project would implement Mitigation Measure CUL-17, which requires implementation of a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) that would reduce some long-term and indirect impacts to unique paleontological resources or unique geological features by providing qualified professionals, sensitivity training, monitoring as outlined in the PRMMP, discovery and fossil recovery in the event resources are encountered, sediment sampling, and documentation and curation for any specimens salvaged during monitoring, and would reduce impacts to less than significant. Therefore, with the implementation of Mitigation Measure CUL-17, the project's incremental contribution to cumulative impacts to paleontological resources would not be cumulatively considerable.

Furthermore, implementation of Mitigation Measure CUL-18 would mitigate the project's potential to disturb any human remains, including those interred outside of formal cemeteries, by providing qualified professionals, preparation of a Cultural Resources Management Plan, worker sensitivity training, archaeological and Native American monitoring, stop-work and avoidance and preservation procedures, and coordination to determine the appropriate disposition of the remains, and cumulative impacts to human remains would be less than significant.

The demolition of NASA's test stands and buildings (cumulative project 115), is not subject to DTSC approval and is therefore not evaluated or described in this PEIR as part of the project. However, impacts from this cumulative project are considered in this cumulative analysis. NASA intends to demolish all buildings and facilities that have been determined to be not eligible for listing in the NRHP, and NASA would retain and preserve one of the remaining test stands and control house and possibly other contributing buildings and features within the related historic district. Historic architectural resources in Area II are the Alfa, Bravo, and Coca Test Area Historic Districts. These districts include 45 total structures, of which 9 are eligible for listing in the NRHP and 36 are eligible as contributing resources to the historic district, and it is possible that up to 100 percent of these historic structures would be demolished; however, NASA is acknowledging a public petition for the Federal Government to preserve the SSFL engine test stands, and has adjusted the demolition schedule in recognition of these efforts. Nonetheless, the demolition of the historic architectural resources eligible for listing in the NRHP would contribute to the cumulatively considerable impacts to cultural resources identified above.

Mitigation

Implement Mitigation Measures CUL-1 through CUL-18, BIO-2, BIO-5, BIO-12, and BIO-19.

Significance after Mitigation

The impact would be significant and unavoidable after implementation of the mitigation measures detailed above. The project, in combination with related projects, would contribute considerably to cumulative impacts to cultural resources.

5.5.5 Geology, Soils, Seismicity

The geographic context for geologic, seismic, and soil impacts includes the project site and cumulative projects adjacent to the project site that could affect slope and soil stability during or after project construction. The timeframe during which the proposed project could contribute to cumulative geology and soils effects would begin with the first excavations performed for the initial projects. It is estimated that soil and groundwater cleanup activities would begin after DTSC certifies the Final PEIR and the respective cleanup decision documents. Groundwater cleanup activities and monitoring would occur until cleanup requirements are met.

As discussed in Section 4.5, *Geology, Soils, and Seismicity*, impacts related to geologic, soil, and seismic hazards would be considered significant if they would cause injury, structural collapse, unrepairable facility or utility damage, or severe service disruption. However, the impacts from geologic, soil, and seismic hazards are largely site specific and, therefore, limited to individual project sites. Thus, cumulative impacts related to geologic, soils, and seismic hazards would only

occur if two or more cumulative project sites are overlapping or adjacent to each other or the project site.

As shown in Figure 5-1, the NASA and Boeing demolition activities, are located within the project site. The NASA EIS determined that the NASA demolition activities would not result in a significant impact related to geologic, soil, and seismic hazards with the implementation of mitigation measures. It is similarly expected that the Boeing demolition activities would also not result in a significant impact related to geologic, soil, and seismic hazards with the implementation of mitigation measures. In addition, the project would result in less-than-significant impacts related to geologic, soil, and seismic hazards with the implementation of Mitigation Measures AQ-5, BIO-5, HYDRO-1, and GEO-1. Thus, while the project and NASA and Boeing demolition activities would have the potential for impacts to combine due to their geographic locations, these projects would implement mitigation measures designed to reduce potential impacts. Implementation of these mitigation measures would ensure that impacts are less than significant and do not combine to result in a cumulative impact. Furthermore, while the potential exists for related projects to be adjacent to other related projects identified in Table 5-2, like the proposed project, these projects would be required to prepare a geotechnical analysis and implement standards and regulations that would ensure that potential impacts are reduced. Therefore, the combined effects related to geology, soils, and seismic hazards from the cumulative projects within the geographic scope of analysis would not be considered cumulatively significant. The project's incremental contribution to impacts related to geology, soils, and seismic hazards in the cumulative scenario therefore would not be cumulatively considerable (less than significant).

Mitigation

Implement Mitigation Measures AQ-5, BIO 5, HYDRO-1, and GEO-1.

Significance after Mitigation

With implementation of mitigation measures, the project, in combination with related projects, would not contribute considerably to geology, seismicity, and soil. Therefore, cumulative impacts to geology, seismicity, and soil would not be cumulatively considerable (less than significant).

5.5.6 Greenhouse Gases

GHG emissions are inherently a cumulative concern, in that the significance of GHG emissions is determined based on whether such emissions would have a cumulatively considerable impact on global climate change; therefore, the geographic scope of cumulative impacts related to GHG emissions and climate change is global. Because GHG emissions, as discussed in Section 4.6, *Greenhouse Gas Emissions*, of this PEIR, are considered cumulative pollutants, the cumulative analysis reflects that of the project analysis. Therefore, the discussion here summarizes the GHG emissions analysis as presented in Section 4.6.

The proposed project would contribute GHG emissions during the initial projects and overall cleanup activities primarily through exhaust from equipment, trucks, and employee vehicles, and during maintenance and monitoring primarily through electricity consumption and worker commutes. **Table 5-4** shows the annual emissions associated with the proposed project as detailed in Section 4.6.5.1. As shown, the unmitigated emissions are predicted to exceed the applicable regulatory threshold and, therefore, would be potentially cumulatively considerable.

TABLE 5-4
ANNUAL GHG EMISSIONS MT/YR[1]

Unmitigated Emissions		Mitigated Emissions	
Phase	**CO_2e**	**Phase**	**CO_2e**
Initial Activities	15,255	Initial Activities	14,025
Overall Cleanup Per Year[2]	18,125	Overall Cleanup Per Year[2]	16,620
Maintenance and Monitoring	731	Maintenance and Monitoring	731
Threshold (2020)	10,000	Threshold (2020)	10,000
Exceeds Threshold	**Yes**	Exceeds Threshold	**Yes**

1. Note: Each phase is compared individually to the threshold as the phases are at least a year in length.
2. Overall cleanup activities include monitoring and maintenance as the activities could overlap.

As detailed in Section 4.6.5.2, the project would not conflict with applicable plans, policies, or other regulations implemented for the reduction of GHG emissions, including the CARB Scoping Plan, SB 375, City of Los Angeles General Plan, Sustainable City pLAn, County of Los Angeles General Plan, or the County of Ventura General Plan. Because project emissions would exceed a regulatory threshold, mitigation is required.

Mitigation

Implement Mitigation Measures AQ-5, EC-1, EC-2, TRANS-1, and GHG 1 through GHG 3.

Significance after Mitigation

Mitigation Measures AQ-5, EC-1, EC-2, TRANS-1, GHG-1, and GHG-2 would reduce GHG emissions from the project, but may not necessarily reduce emissions to less than significant. Mitigation Measure GHG-3 would further reduce direct GHG emissions from diesel use as technological advances allow. Mitigation Measure GHG-3 commits the RPs to offset emissions (that cannot be eliminated by other means) by encouraging the implementation of energy reduction measures offsite, and/or purchasing carbon credits, which are generated when permanent, verifiable reductions in GHG emissions are achieved by the seller. Thus, the project would result in less than significant impacts associated with GHG emissions, either directly or indirectly. As mentioned above, the project would not be inconsistent with state and local goals, plans, and policies. Therefore, cumulative impacts to GHG and global climate change would not be cumulatively considerable (less than significant).

5.5.7 Hazards and Hazardous Materials

For the analysis of cumulative impacts associated with hazards and hazardous materials, the geographic scope encompasses the project site and the proposed transportation haul routes used for disposal of hazardous soils and building debris. In general, impacts associated with hazardous materials tend to be site specific and occur as isolated events if there are no routine emissions, as is the case with the proposed project. Cumulative impacts could only occur in the unlikely event that two or more hazardous materials spills happened at the same time and place.

As discussed in Section 3.7.5, *Schedule and Workforce*, of this PEIR, the timeframe for which cumulative impacts are evaluated is anticipated to begin shortly after the approval of the initial cleanup decision documents. It is estimated that soil excavation and disposal activities would begin after DTSC certifies the Final PEIR and related cleanup decision documents. Excavation and disposal activities are expected to be completed within 15 years, although monitoring activities for enhanced or natural attenuation may occur over a longer period of time based on confirmation sampling, which would require ongoing monitoring until cleanup requirements are met.

Table 5-2 lists the cumulative projects and activities considered in this PEIR and Figure 5-1 illustrates the locations of these projects. Cumulative project 115, the NASA demolition activities, and cumulative project 129, the Boeing demolition activities, are located within the boundaries of the proposed project site and, as such, are included in the geographic scope of this cumulative analysis. The cumulative projects and activities located along the proposed haul routes (including local roads, US 101, SR 118) are also included because the highways are assumed to be the main transportation routes for hazardous materials to offsite disposal facilities.

Project remediation activities during the overall site cleanup and initial activities would result in less-than-significant health risk impacts with regard to TACs emissions. Compliance with cleanup decision documents and Mitigation Measures AQ-1, AQ-3, AQ-5, and GHG-3 would further reduce the less-than-significant health risk impacts (e.g., the cancer risk at the maximum impacted sensitive receptor would be reduced from 6.6 in a million to 1.7 in a million, which would both be below the significance threshold of 10 in a million). Transportation of radioactive materials has the potential to create a significant hazard to the public. However, implementation of Mitigation Measures TRANS-1 (Traffic Management Plan), HAZ-2 (Hazardous Materials Containment) and HAZ-5 (Transport of Radiological Material) would reduce the impact to less than significant levels. Specifically, Mitigation Measure TRANS-1 would coordinate onsite deliveries and offsite hauling for both within SSFL and on public roadways for safe and efficient traffic flow, and ensure the haul routes avoid sensitive habitat areas and residential areas; Mitigation Measure HAZ-2 would contain the hazardous materials through properly packaging, used licensed hauler and disposal facilities for radioactive materials; and Mitigation Measure HAZ-5 would limit the number of truck trips transporting low-level radioactive waste (LLRW) and mixed low-level radioactive waste (MLLRW) to 2,080 trips on an annual basis or an average of eight trucks per day. As a result, the project's contribution to cumulative impacts associated with the routine transport, use, or disposal of hazardous materials would not be cumulatively considerable.

Potential hazards caused by routine use or reasonably foreseeable accident conditions would include spills involving the soil, groundwater, demolition materials, and lead shot transported and removed from the project site that contain chemicals and radionuclides above cleanup levels, and chemicals brought to and used at the site (fuels, lubricants, paint, and solvents, as well as the chemical agents used to treat soil or groundwater). Because of the relative remoteness of and restricted access to the project site, the majority of impacts relative to hazards and hazardous materials would be largely confined to the project site and, thus, would not likely combine with any of the other cumulative projects to result in significant cumulative impacts. Furthermore, the in-place treatment methods, such as soil vapor extraction or onsite groundwater treatment, would not require the movement of hazardous materials from or to offsite locations, which limits impacts related to the accidental release of hazardous materials. However, there is the potential for cumulative impacts to occur on the project's transportation routes, both onsite and offsite, that could potentially be shared with the cumulative projects that also transport hazardous materials and at the disposal sites where the project's hazardous waste is being disposed, potentially along with related projects.

Cumulative hazards and hazardous materials impacts could occur if transport-related project activities combined with the transport-related cumulative project activities and resulted in simultaneous accident conditions involving the release of hazardous materials along the haul routes or further out on US 101 or SR 118. As discussed in Section 4.7.5.2 of this PEIR, when considering the potential risk of upset impacts for the overall site cleanup, a collision involving a truck transporting material resulting in a release could potentially occur several times over the duration even with the implementation of mitigation measures. Therefore, impacts related to routine use or reasonably foreseeable upset and accident conditions involving hazardous materials for the overall site cleanup would be potentially significant. This impact would have the potential to combine with impacts of cumulative projects (including 104, 107, 108, 109, 112, 113, 114, 115, and 129) that would result in additional trucks carrying hazardous materials on the same roads as project trucks would travel. Therefore, the project's contribution to transport-related cumulative impacts would be potentially significant.

In the event of a release, state and local hazardous materials regulations and standards, which are described in Section 4.7, *Hazards and Hazardous Materials*, of this PEIR, have been established to address and reduce the potential for such impacts to occur and to establish response plans to limit the extent of releases that do occur. The project and related projects would be required to comply with applicable provisions of these laws and regulations. In addition, the project would be required to implement Mitigation Measures HAZ-1, HAZ, 2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1, implementation of which would ensure that hazardous materials would be properly managed and transported to prevent or minimize releases, and any spills would be immediately cleaned up in the event of an accidental release. Each of the cumulative projects would also be required to prepare and implement a Health and Safety Plan and a Hazardous Materials Business Plan, as implemented by Mitigation Measures HAZ-1 and HAZ-3, respectively, which would describe the requirements for the proper containerization and transport of hazardous materials. However, when considering the potential risk of upset impacts for the proposed project and related projects, a collision involving a truck transporting material resulting in a release could potentially occur several times over the duration even with the implementation of feasible

mitigation measures. Thus, the project's potentially significant impact would cumulatively combine with the related projects located on the haul routes and impacts would be significant and unavoidable. The project's contribution would be cumulatively considerable.

In addition, cumulative hazards and hazardous materials impacts could occur if disposal-related project activities combined with the disposal-related cumulative projects activities and resulted in simultaneous accident conditions involving the release of hazardous materials at the chosen disposal site. However, given that these facilities accept hazardous materials daily, they have standard procedures for accepting waste and cleaning up waste, should an accidental condition occur. Furthermore, as described above, state and local hazardous materials regulations and standards have been established to address and reduce the potential for such impacts to occur and to establish response plans to limit the extent of releases that do occur. Therefore, the project's contribution to cumulative impacts associated with the routine disposal of hazardous materials would be less than significant. Please refer to Section 5.5.12, *Utilities and Service Systems*, of this PEIR, for further discussion of cumulative impacts of disposal of hazardous waste materials.

The project would not be within one-quarter mile of an existing or proposed school; however, there are 14 schools or daycare center located within one-quarter mile or more of the four proposed transportation routes that would be used to access the project site. Implementation of Mitigation Measures HAZ-1, HAZ-2, HAZ-3, and TRANS-1 would reduce impacts to a less-than-significant level. While there would be related projects on the same transportation routes, the likelihood that these would combine with the proposed project to result in the release of hazardous emissions or of acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school is considered low. Thus, given the proposed project's less-than-significant impact with implementation of mitigation measures and the low likelihood of the proposed project and related projects impacts to combine, impacts related to emissions within one-quarter mile of a school would not be cumulatively considerable and impacts would be less than significant with mitigation incorporated.

The proposed project and cumulative projects 115 and 129 are within an area with a known very high FHSZ area. Given the high potential for fire, the proposed project would implement Mitigation Measures HAZ-1, HAZ-3, and HAZ-4. Implementation of these mitigation measures, combined with compliance with existing federal, state, and local regulations, would ensure that people or structures would not be exposed to a significant risk of loss, injury or death involving wildland fires and that impacts are less than significant. Thus, there would be no cumulative impact.

As part of the proposed remediation efforts, the use of chemical amendments would be necessary for certain soil and groundwater treatment technologies (e.g., bioventing, land farming, and in situ chemical oxidation, in situ enhanced biological treatment, and passive seep treatment) to facilitate cleanup of soil and groundwater. Potential impacts associated with chemical amendments would be limited to the project site; thus, the only projects that would be able to cumulatively combine would be cumulative projects 115 and 129. Compliance with cleanup decision documents and Mitigation Measures HAZ-4, HYDRO-1, and HYDRO-2 would ensure that chemical amendments would not create a significant hazard to the public or the environment through the

presence of chemical amendments for the treatment of chemicals in soil and/or groundwater. Therefore, impacts related to the use of chemical amendments would be less than significant with mitigation incorporated. Given that the related projects would be required to comply with cleanup decision documents and appropriate mitigation measures, cumulative impacts would be less than significant.

The project site has been identified by DTSC and CalEPA as a contaminated site. Therefore, the proposed project and cumulative projects 115 and 119 would all result in significant and unavoidable impacts as a result of the project site being identified as a hazardous materials site. While the project would implement Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HYDRO-1, HYDRO-2, and TRANS-1, these would not reduce impacts to a level below significance. Therefore, this is a cumulative significant and unavoidable impact.

Mitigation

Implement Mitigation Measures HAZ-1, HAZ-2, HAZ-3, HAZ-4, HAZ-5, HYDRO-1, HYDRO-2, and TRANS-1.

Significance after Mitigation

With implementation of mitigation measures, the project, in combination with related projects, could potentially result in reasonably foreseeable upset and accident conditions involving the release of hazardous materials. Furthermore, the proposed project is considered a contaminated site per DTSC and CalEPA. Therefore, impacts related to hazards and hazardous materials would be cumulatively considerable (significant and unavoidable).

5.5.8 Hydrology and Water Quality

The geographic context for cumulative impacts to hydrology and water quality is the Los Angeles River and Calleguas Creek watersheds. This geographic scope was selected because the project site is part of these watersheds, and impacts from the proposed project would be limited to these watersheds. The timeframe during which the proposed project could contribute to cumulative hydrology and water quality effects would begin when the first excavations are performed for the initial projects. It is estimated that soil and groundwater cleanup activities would be completed within approximately 15 years, although enhanced or natural attenuation monitoring activities may occur over a longer period of time based on confirmation sampling, which would require ongoing monitoring until cleanup requirements are met. Timeframes for completion of the process(es) will be carefully considered and limited as appropriate.

The projects that fall within the geographic scope that are considered in this cumulative analysis include all the projects found in Table 5-2, except for cumulative project 128, the Exide Remediation Project. The cumulative project list contains a variety of projects but largely consists of development projects that would construct new residential, commercial, or industrial improvements, as well as other remediation projects. These projects generally involve some earthwork activities in preparation of constructing building foundations, grading for roads, and installation of utilities. Construction activities have the potential to disturb surface soils and

potentially expose them to the effects of wind and water, which could cause erosion and sedimentation and pollutant loading to the associated watersheds if not managed appropriately.

When added to the cumulative scenario described above, the effects of the proposed project would contribute incrementally to the cumulative impacts on erosion, sedimentation, and pollutant loading to the Los Angeles River or Calleguas Creek watersheds. However, the proposed project and other current and future projects in the vicinity would all be required to comply with the BMPs for erosion control that are required by the Construction General Permit for all projects that disturb at least 1 acre, as well as any local grading permit requirements such as preparation and implementation of an erosion control plan. BMPs that would be employed at construction sites as part of SWPPPs and erosion control plans (for sites that disturb less than 1 acre) are designed to prevent erosion and transport of sedimentation offsite at each site and have proven effective.

Additionally, current and future new development projects would be required to demonstrate that stormwater volumes could be managed by stormwater conveyance facilities created by the development and designed to control stormwater flows in accordance with local and regional stormwater requirements. Utility improvements such as replacement of gas lines or transmission lines would not have much of an effect on drainage patterns, but all the new mixed use development would. The creation of new impervious surfaces can result in new sources of stormwater pollutants. However, the proposed project would not include the creation of new impervious surfaces and, in fact, with the proposed demolition, would result in a net reduction in impervious surfaces. Thus, the project would not create additional sources of stormwater pollutants and ultimately would remove pollutants from the site compared to existing conditions. As a result of project-related demolition and remediation, the project would eventually return drainage patterns at the site closer to predevelopment conditions. Other current and future development projects would be required to implement drainage control features that minimize the offsite transport of stormwater pollutants. Other current and future remediation projects, similarly to the proposed project, would be required to implement BMPs similar to those implemented for the proposed project during remediation efforts that require earthwork activities—this, upon attaining remediation goals, would result in a reduction in pollutant sources.

A majority of the cumulative projects include new development which could increase the amount of impervious surfaces and, thus, potentially create additional stormwater flows. If not managed appropriately, these projects could create or exacerbate flooding conditions. However, all development projects would be required to demonstrate that stormwater volumes could be managed by stormwater conveyance facilities designed to control onsite stormwater flows in accordance with local and regional stormwater requirements. The proposed project would result in a net reduction in impervious surfaces and as a result could not combine with other cumulative projects to create flooding hazards.

The overall purpose of the proposed project is to improve water quality and remove or substantially reduce the sources of contamination currently present at the site; thus, the proposed project would not present any cumulative effects related to water quality. The proposed project along with the other cumulative projects would be required to comply with construction controls

and drainage and grading ordinances intended to control earthwork activities and regulate water quality during construction at each site. Additionally, once constructed, new projects would be required to demonstrate that stormwater volumes could be managed by downstream conveyance facilities. The project's contribution to additional flows downstream would be negligible due to the overall lack of any new impervious surfaces. The remediation element of the project would have a beneficial impact by reducing the potential threat on water quality for downstream receiving waters within both the Los Angeles River and Calleguas Creek watersheds.

Therefore, when considered in addition to the anticipated impacts of other projects in the cumulative scenario, the proposed project's incremental contribution to hydrologic and water quality impacts would not be cumulatively considerable (less than significant).

Mitigation

No mitigation measures are required.

Significance after Mitigation

The project, in combination with related projects, would not contribute considerably to hydrology and water quality. Therefore, cumulative impacts to hydrology and water quality would not be cumulatively considerable (less than significant).

5.5.9 Land Use and Planning

There are 129 related projects in the vicinity of the project site, which generally consist of remediation and cleanup projects, residential and commercial development, open space and recreation improvements, and infill and redevelopment projects. As identified in Figure 5-1, the nearest related projects are cumulative projects 115 and 129, which are located within the project site and would result in similar impacts given the similar nature of the projects. The proposed project could combine with these related projects to cumulatively conflict with the Ventura County General Plan. Specifically, the project would conflict with Ventura County General Plan Chapter 1, *Resources*, Air Quality Policy 1.2.2 (1), which requires discretionary development to be consistent with the applicable Air Quality Management Plan. As proposed, the overall site cleanup and initial projects would be inconsistent with VCAPCD's and SCAQMD's Air Quality Management Plans because emissions would exceed the regulatory thresholds during cleanup activities for NOx within both air districts (see Section 4.2, *Air Quality*, for additional detail). Therefore, the project would be inconsistent with Policy 1.2.2 (1) and would result in a significant and unavoidable impact even with the implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, HAZ-2, and TRANS-1.

Furthermore, the overall site cleanup and initial projects would be inconsistent with Ventura County General Plan Chapter 1, *Resources*, Biological Resources Goal 1.5.1 and, Chapter 3, *Land Use*, Open Space Policy 3.2.1 (5)(1), which require the preservation of significant biological resources in Ventura County. The overall site cleanup and initial project activities would result in the removal of native vegetation and soil, and would adversely affect sensitive/special status plants, wildlife, and habitat as discussed in Section 4.3, *Biological Resources*. Given these impacts, the project would be inconsistent with these policies. This would

result in a significant and unavoidable impact even with implementation of Mitigation Measures BIO-1 through BIO-23. Given these conflicts, the proposed project would contribute to a significant and unavoidable cumulative land use impact.

The overall site cleanup and initial activities would have a significant and unavoidable cumulative impact on land use because they would conflict with the policies of the Ventura County General Plan. Given the similar nature of cumulative projects 115 and 129, when combined with the project's significant and unavoidable impact, an increase in the severity of land use impacts would occur. Thus, cumulative impacts would be significant and unavoidable and would remain significant even after implementation of Mitigation Measures AQ-1 through AQ-1 through AQ-5, BIO-1 through BIO-23, GHG-1, HYDRO-1, HYDRO-2, HAZ-2, HAZ-3, and TRANS-1. No additional feasible mitigation to reduce impacts is available.

Mitigation

Implement Mitigation Measures AQ-1 through AQ-5, BIO-1 through BIO-23, GHG-1, HYDRO-1, HYDRO-2, HAZ-2, HAZ-3, and TRANS-1.

Significance after Mitigation

The impact would be significant and unavoidable after implementation of the mitigation measures detailed above. The project in combination with related projects would contribute considerably to cumulative land use impacts (significant and unavoidable).

5.5.10 Noise

The cumulative noise assessment considers development of the project in combination with ambient growth and other development projects within the vicinity of the proposed project. Because the effects of both noise and vibration levels are localized in nature and are drastically reduced in magnitude as distance from the source increases, only projects and ambient growth in the nearby area could combine with the proposed project to result in cumulative impacts. As such, the geographic scope for the cumulative construction-related noise and vibration analysis is the maximum reasonable distance within which project-related noise could be heard at any point from the initiation of its onsite activities. For this analysis, projects located immediately adjacent to the project site or projects that would result in adding vehicle trips to Woolsey Canyon Road are considered to determine whether they would cause noise and vibration impacts that could combine with those of the proposed project to cause or contribute to cumulative construction-related environmental effects. As identified in Figure 5-1, cumulative projects 115 and 129 are located within immediate proximity to the proposed project site, as they are within the project site. Both projects are demolition activities that would result in adding truck trips to Woolsey Canyon Road. With respect to traffic noise levels resulting from the project and other cumulative projects, the geographic scope for the analysis is the local street system in the project study area that was analyzed in the project traffic report (KOA, 2017).

Implementation of the project in combination with other related projects in the cumulative scenario would result in an increase in construction-related noise in the project area, including Sage Ranch Park. However, cumulative projects 115 and 129 are also located within the project

site, and would be subject to the construction noise regulations of the County of Ventura. Due to the large size of the project site and the localized nature of noise, construction noise levels that would be experienced at the nearest offsite sensitive receptors would continue to be the loudest when construction activities are occurring at an area within the 2,850-acre project site that is nearest to each of the offsite receptors. In conducting the construction noise analysis for the project, noise levels were estimated for a conservative scenario in which five of the loudest pieces of construction equipment with the highest usage percentage were assumed to be operating simultaneously at the same location at the boundary line of the administrative areas nearest to each of the identified offsite noise-sensitive receptor locations (i.e., existing single-family residential, park, and university uses located around the project site). Because the construction activities for the related projects would occur within the project site, the noise levels experienced at the nearest offsite receptors would still be dominated by those generated by the project at the project site boundary line. Thus, even if construction activities associated with the proposed project and cumulative projects 115 and 129 were to occur concurrently within the project site, the noise levels experienced at each of the nearest offsite sensitive receptor locations would not be greater than those that were estimated in the project's noise analysis.

For the sensitive receptors located in the county or city of Los Angeles, the overall site cleanup would not exceed the applicable noise standards established by the County of Los Angeles as shown on Table 4.10-15. However, the overall site cleanup would generate noise levels that would exceed the applicable noise standards established by the County of Ventura for noise-sensitive land uses at Sage Ranch Park (see Table 4.10-14). Mitigation Measure NOISE-1 would reduce impacts so that the applicable County of Ventura noise threshold would not be exceeded for sensitive receptors within Sage Ranch Park (see Figure 4.10-4). This impact would be less than significant with mitigation incorporated.

With respect to impacts associated with vibration levels, the greatest cumulative impact on sensitive receptors in the project area would occur during concurrent construction activities of the project with other cumulative projects. However, due to the rapid attenuation of vibration levels over distance, potential adverse vibration impacts on offsite structures would be site-specific, as only receptors located directly adjacent to a construction site would be exposed to perceptible vibration levels.

As shown in Table 4.10-17, none of the nearby offsite residential or university campus structures surrounding the project site would be exposed to a PPV ground-borne vibration level that exceeds 0.2 in/sec or 0.3 in/sec, respectively, during the operation of construction equipment for project cleanup activities. In terms of human annoyance, the vibration levels forecasted to occur at the offsite sensitive receptors would range between 20.24 VdB and 37.70 VdB, which is well below the FTA's 80 VdB and 83 VdB criteria for residences or places where people may sleep and institutional land uses, respectively, at the nearest offsite sensitive receptors. Residences at the Summit Mobile Home Community are located within the County of Los Angeles. The Los Angeles County Noise Ordinance prohibits the operation of any device that creates vibration above the vibration perception threshold of any individual at 150 feet (46 meters) from the source if on a public space or public right-of-way. The County Noise Ordinance identifies a presumed perception threshold of 0.01 in/sec. Rubber-tire vehicles rarely result in substantial ground-borne

vibration unless there is a discontinuity or bump in the road that causes the vibration (FTA, 2006). As presented in Table 4.10-16, project-related trucks would, where discontinuities or bumps are present on a roadway, generate vibration levels of 0.076 in/sec PPV at 25 feet to 0.011 in/sec PPV at 100 feet. At 150 feet, the vibration levels generated by loaded trucks would be reduced to approximately 0.005 in/sec PPV, which is well below the Los Angeles County perception threshold of 0.01 in/sec. Cumulative project 115 would involve using trucks to haul demolition spoils along Woolsey Canyon Road. If these trucks were to encounter discontinuities or bumps in the road, they would result in similar vibration levels as project-related trucks. Therefore, when combined with impacts from cumulative projects, proposed project impacts related to vibration would not be considerable and would be less than significant.

Cumulative mobile source noise impacts would occur primarily as a result of increased traffic on the local roadways due to the project and cumulative projects within the project's traffic study area. Therefore, cumulative traffic-generated noise impacts have been assessed based on the contribution of the proposed project to the future year 2032 cumulative base traffic volumes on the roadway segments in the project vicinity. The peak-hour noise levels associated with existing traffic volumes and cumulative base traffic volumes with the proposed project (i.e., future cumulative traffic volumes) under the scenario with a maximum of 96 daily trucks are shown in **Table 5-5**.

As shown in Table 5-5, cumulative development along with the project under the scenario with a maximum of 96 daily trucks would increase the peak hour traffic noise levels by a maximum of 7.8 dBA, on the roadway segments of Woolsey Canyon Road, between Valley Circle Boulevard and Knapp Ranch Road and Facility Road at Woolsey Canyon Road, while all of the other study roadway segments would experience an increase in peak hour traffic noise levels of less than 3 or 5 dBA over existing conditions. As the roadway segments of Woolsey Canyon Road between Valley Circle Boulevard and Knapp Ranch Road and Facility Road at Woolsey Canyon Road would experience more than a 5 dBA increase in peak hour traffic noise levels, the cumulative traffic noise impacts on this roadway segment would be cumulatively significant. Mitigation Measures NOISE-2 and NOISE-3 would require the installation of temporary noise barriers as practical. However, because construction of noise barriers of this scale for the entire 20-year duration of the project may not be feasible, practical, or acceptable to the noise-sensitive users in certain locations, this impact would be significant and unavoidable.

Mitigation

Implement Mitigation Measures NOISE-1 through NOISE-3.

Significance after Mitigation

Impacts related to increases in ambient noise levels would be significant and unavoidable after implementation of the mitigation measures detailed above. The project, in combination with related projects, would contribute considerably to cumulative noise impacts (significant and unavoidable).

TABLE 5-5
CUMULATIVE PEAK-HOUR ROADWAY NOISE LEVELS WITH PROJECT

Roadway Segment	Noise Levels in dBA L_{eq}(hourly)[a] Baseline (2015) Traffic Volumes (A)	Future (2032) Without Project Traffic Volumes (B)	Future (2032) With Project Traffic Volumes (C)	Cumulative Increase (C–A)	Significance Threshold[b]	Significant?
Box Canyon Road, between Santa Susana Pass Road and Roberson Road	55.5	56.5	56.6	1.1	3.0	No
Santa Susana Pass Road, between Rocky Peak Road and Box Canyon Road	54.1	55.1	55.2	1.1	3.0	No
Woolsey Canyon Road, between Valley Circle Boulevard and Knapp Ranch Road	54.7	55.7	62.5	7.8	5.0	Yes[d]
Valley Circle Boulevard, between Box Canyon Road and Woolsey Canyon Road	55.6	56.5	57.0	1.4	5.0	No
Valley Circle Boulevard, between Plummer Street and Schumann Road	59.4	60.4	60.8	1.4	5.0	No
Plummer Street, between Valley Circle Boulevard and Farralone Avenue	61.4	62.4	62.7	1.3	5.0	No
Valley Circle Boulevard, between Woolsey Canyon Road and Chatlake Drive	60.6	61.6	62.4	1.8	5.0	No
Roscoe Boulevard, between Woodlake Avenue and Shoup Avenue	64.3	65.3	65.9	1.6	5.0	No
Roscoe Boulevard, between Shoup Avenue and Farralone Avenue	68.4	69.4	69.6	1.2	5.0	No
Valley Circle Boulevard, between Vanowen Street and Victory Boulevard	68.9	69.9	70.0	1.1	5.0	No
Valley Circle Boulevard, between Burbank Boulevard and US 101	69.1	70.1	70.2	1.1	5.0	No
Facility Road at Woolsey Canyon Road[c]	30.2	31.2	35.2	5.0	3.0	Yes

NOTES:

[a] Values represent noise levels at 100 feet from the centerline of the roadway.

[b] For the purpose of this analysis a substantial increase in traffic noise levels would occur if the project's truck and construction worker vehicle trips would contribute to a traffic noise level increase of 3 dBA or greater over existing ambient noise levels within the county of Ventura and 5 dBA or greater over existing ambient noise levels within the county of Los Angeles and the city of Los Angeles.

[c] Noise levels for this roadway are based on the distance of 1,300 feet, where an actual noise-sensitive receiver is located and traffic volumes are the same as Woolsey Canyon Road due to the lack of information.

[d] Because the grade of Woolsey Canyon Road exceeds 5 percent, TNM was used to estimate noise levels, which were the average of 20 front row house locations at Summit Mobile Home Community.

SOURCE: KOA, 2017 (see Appendix H of this PEIR); ESA, 2017d (see Appendix I of this PEIR).

5.5.11 Transportation and Traffic

The geographic scope for cumulative impacts to transportation and traffic is focused on projects (currently under construction, approved, or reasonably foreseeable) located such that traffic generated by those projects would use one or more of the four haul routes for the proposed project (i.e., the roadways analyzed in Section 4.11, *Transportation and Traffic*) during the anticipated 2018–2032 remediation period. This geographic scope was selected because the potential for cumulative transportation impacts exists where there are multiple projects proposed in an area that have overlapping construction schedule and/or project operations that could affect similar resources. Projects with overlapping construction schedules and/or operations could result in a substantial contribution to increased traffic levels and/ roadway hazards throughout the surrounding roadway network.

As described in Section 4.11, *Transportation and Traffic*, traffic associated with both the overall site cleanup and the initial activities would substantially degrade traffic LOS at area intersections and on area roadways. Once cleanup activities are completed, the project would not affect the area's traffic LOS because project-generated vehicle trips would cease when activities associated with site cleanup end. Mitigation Measure TRANS-1 would reduce direct or indirect impacts during project cleanup activities; however, it would not reduce impacts to a level that is less than significant. Mitigation Measure TRANS-2 would ensure any project-related damage to roadways would be repaired. Therefore, project impacts related to roadway congestions would be significant and unavoidable while impacts related to roadway damage would be less than significant with mitigation incorporated.

Projects that fall within the geographic scope that are considered in this cumulative analysis include 23, 100, 104, 107, 108, 109, 112, 113, 114, 115, and 129 (located along or near the proposed project local haul routes), and others (primarily development projects that would construct new residential, commercial, or industrial improvements) farther removed but in the SR 118 and US 101 corridors. Those projects would generate remediation/construction traffic (worker commute trips and truck trips hauling exported excavated material and imported fill material). There is the potential for traffic generated by more than one project to use the same roads; that is, the total number of vehicle trips added to a common route due to concurrent construction of multiple projects could be cumulatively higher than the maximum number of daily and hourly vehicle trips used to determine impacts of a single project. The period of time of maximum trip generation would vary among the projects and maximum traffic flows on the common routes would not necessarily be the sum of the maximum trips generated by overlapping projects. The schedule of numerous projects listed in Table 5-2 is uncertain, but schedules are likely to overlap to some degree. Cumulative impacts would be greatest if the peak traffic-generating periods were to overlap. This worst-case scenario is unlikely, but the cumulative increases in traffic levels on area roads could be substantial. Consequently, it is prudent to conclude that the combined effects to transportation and traffic from the cumulative projects within the geographic scope of analysis could significantly degrade traffic LOS at area intersections and on area roadways.

When added to the cumulative scenario described above, the significant and unavoidable effects of the proposed project would contribute incrementally to the cumulative impacts on transportation and traffic. The proposed project and other current and future projects in the vicinity would all be required to implement measures (like Mitigation Measure TRANS-1 described in Section 4.11, *Transportation and Traffic*) to prevent direct or indirect impacts to transportation and traffic from occurring. Specific measures to mitigate significant impacts that could occur would be determined as part of the interagency coordination, but could include measures such as employing flaggers during key construction periods, designating alternate haul routes, and providing more outreach and community noticing. With these measures, the proposed project's potential impacts would not represent a considerable contribution to this potential cumulative impact.

Although the project's contribution to potential cumulative impacts would be temporary and would cease upon completion of site cleanup activities, the addition of project-related traffic to the local roadway network would be cumulatively considerable. Therefore, when considered in addition to the anticipated impacts of other projects in the cumulative scenario, the proposed project's incremental contribution to transportation and traffic impacts would be cumulatively considerable (significant and unavoidable).

Mitigation

Implement Mitigation Measures TRANS-1 and TRANS-2.

Significance after Mitigation

With implementation of mitigation measures, the project, in combination with related projects, would contribute considerably to transportation and traffic. Therefore, cumulative impacts to transportation and traffic would be cumulatively considerable (significant and unavoidable).

5.5.12 Utilities and Services

This cumulative analysis only considers the cumulative impacts of solid waste disposal. As noted in Section 4.12, *Utilities and Service Systems,* and Chapter 7.0, *Impacts Found Not to Be Significant*, there would be no or less-than-significant impacts related to water use, wastewater generation, and no increase in demand for communication services. Therefore, these topics were not discussed further in the PEIR and will not be considered for cumulative impacts.

The geographic scope of the cumulative solid waste analysis includes the service areas of the solid waste disposal facilities that would most likely serve the project site, as identified in Section 4.12, *Utilities and Service Systems*. These facilities include the Chiquita Landfill, Kettleman Hills Facility, Lancaster Landfill, and/or Mesquite Regional Landfill for non-hazardous waste; the Kettleman Hills Facility, La Paz County Landfill, U.S. Ecology Beatty, Clean Harbors Buttonwillow Landfill, and/or Clean Harbors Westmorland Landfill for hazardous waste; and the Nevada National Security Site for radiological waste. As discussed in Section 3.6.4, *Schedule, Workforce, and Equipment*, the timeframe during which the overall cleanup activities could contribute to cumulative solid waste impacts is anticipated to begin with the first excavations performed for the initial projects. It is estimated that soil and groundwater cleanup

activities would begin after DTSC certifies the Final PEIR and the respective cleanup decision documents. Groundwater cleanup activities and monitoring would occur until cleanup requirements are met.

Potential cumulative impacts related to solid waste facilities and solid waste disposal would occur if the project and related projects within the geographic scope would be served by a facility without sufficient permitted capacity to accommodate solid waste disposal needs, or if the project and related projects would not comply with federal, state, and local statutes and regulations related to solid waste. Specifically, cumulative projects producing solid waste during construction and operation, including cleanup, residential, and commercial projects that typically generate an increase in solid waste and disposal, could produce a waste stream that when combined could not be accommodated by current solid waste facilities within the geographic scope, resulting in a cumulatively considerable impact to solid waste facilities.

The cumulative projects listed in Table 5-2 would generally be served by the local municipal solid waste disposal facilities and hazardous waste disposal facilities, which could cumulatively combine to result in impacts to solid waste facilities. These projects include development of residential, retail, commercial, office building, school, industrial, and warehouse uses. Construction and operations of the related projects would generate solid waste typical of this type of development, including the removal of existing structures and other construction waste. However, these cumulative development projects would be required to participate in local programs designed to divert 50 percent of waste from landfills, and eventually statewide requirements to divert 75 percent of waste from landfills once finalized. In addition, all cumulative projects implemented in the area would also be required to comply with federal, state, and local solid waste regulations and statutes. Participation in such local programs and compliance with solid waste regulations and statutes would ensure that waste from cumulative projects is reduced to the maximum extent possible and disposed of at permitted facilities with sufficient capacity to accept the waste.

There are 12 cumulative projects (104, 107, 108, 109, 110, 115, and 129) that are similar to the proposed project in that they are remediation and/or demolition activities that may result in sending waste to area disposal facilities. Given the nature of these projects, it is likely that they would use the same landfills as those listed above for the proposed project and, thus, could cumulatively combine to result in capacity impacts at these facilities. As described in Table 4.12-2, of this PEIR, the non-hazardous waste facilities listed above (Chiquita Landfill, Kettleman Hills Facility, Lancaster Landfill, and/or Mesquite Regional Landfill) currently have a combined permitted remaining capacity to accommodate over 20 million cubic yards of non-hazardous waste. The hazardous waste facilities (Kettleman Hills Facility, La Paz County Landfill, U.S. Ecology Beatty, Clean Harbors Buttonwillow Landfill, and/or Clean Harbors Westmorland Landfill) currently have a combined permitted remaining capacity to accommodate over 7 million cubic yards of hazardous waste. One facility, the Nevada National Security Site, has permitted remaining capacity to accommodate approximately 1.8 million cubic yards of radiological waste. At this time, it is not known what type and how much waste would be generated by the related projects. In addition, it is likely that implementation of the related projects would occur at different times. Thus, given the remaining capacity at these landfills,

participation of local programs designed to reduce waste, and compliance with solid waste regulations and statutes, it is reasonable to assume that there would be sufficient capacity at the identified landfills to accommodate waste from the related projects. Therefore, it is anticipated that solid waste demand from operation of the related projects would not exceed the capacity of disposal facilities and would not be cumulatively considerable.

When added to the cumulative scenario above, the effects of the proposed project would contribute incrementally to the cumulative impacts on solid waste facilities. The proposed project would dispose of approximately 1,581,000 cubic yards of non-hazardous waste, which represents approximately 7.9 percent of the total capacity available at these four non-hazardous facilities; approximately 808,000 cubic yards of hazardous waste, which represents approximately 11.5 percent of the total capacity available at the five hazardous facilities; and approximately 134,000 cubic yards of radiological waste, which represents approximately 7.4 percent of the total capacity available at the Nevada National Security Site. Furthermore, it is important to note that the 7 million cubic yards of available capacity at hazardous waste facilities does not include the capacity at two of the landfills (Clean Harbors Westmorland and La Paz County Landfill) since capacity information was not available at the time this PEIR was prepared, as described in Table 4.12-2, of this PEIR. However, the Clean Harbors Westmorland has available capacity until the year 2100 and it is reasonable to assume that the La Paz County Landfill also has remaining capacity, both of which would increase the total remaining capacity and would thus lower the percent that the proposed project would represent of the total remaining capacity. Given the project's incremental contribution to capacity at these waste disposal facilities, it is not anticipated that the proposed project would contribute to cumulative solid waste impacts. Furthermore, given the total number of solid waste disposal facilities identified in Section 4.12, *Utilities and Service Systems,* if available capacity was threatened at any of the facilities listed above, the proposed project and related projects would be able to divert waste to a facility that is able to accommodate the waste. However, it is unlikely that this would occur given the remaining capacity at the facilities evaluated in this analysis. Thus, it is anticipated that solid waste demand from the proposed project and related projects would not exceed the capacity of disposal facilities, and would not be cumulatively considerable.

Mitigation

No mitigation measures are required.

Significance after Mitigation

The project, in combination with related projects, would not contribute considerably to utilities and service systems. Therefore, cumulative impacts to utilities and service systems would not be cumulatively considerable (less than significant).

5.5.13 Energy Consumption

The geographic scope of the cumulative energy consumption analysis includes the state of California for petroleum supply, the SCE service area for electrical power supply, and the SoCal Gas service area for natural gas supply. However, the use of natural gas is not proposed for either the overall site cleanup or initial activities, nor is natural gas service currently provided at the

project site. Therefore, it is assumed that the project would not consume natural gas. A cumulatively significant impact involving energy consumption would result if the project would cumulatively contribute to the need for additional energy capacity.

Proposed petroleum use for soil and groundwater cleanup was calculated using the estimated traffic trip generation rates associated with haul and supply trucks, worker and visitor vehicles and onsite off-road remediation equipment, and fuel emission factors provided by the USEIA (USEIA, 2016b). The project would consume a maximum total of 10,739,085 gallons of petroleum fuels and post cleanup monitoring and maintenance activities would consume a maximum total of 2,393,340 gallons of petroleum fuels (see Table 4.13-3). As of December 31, 2015, California had 2,845 million barrels of crude oil left in the state's reserves (USEIA, 2016a). In addition, according to the USEIA International Energy Outlook 2016, the global supply of crude oil, other liquid hydrocarbons, and biofuels is expected to be adequate to meet the world's demand for liquid fuels through 2040 (USEIA, 2016a). It is not anticipated that the project would increase demand for petroleum supplies such that available local and regional energy supplies would not be capable of serving the project in addition to the cumulative projects. Therefore, this impact would be less than significant.

The overall site cleanup has the potential to consume substantial quantities of electricity due to the proposed use of electricity-consuming cleanup technologies, such as soil vapor extraction, bioventing, gaseous electron donor injection, and thermal desorption, in addition to ongoing use of offices, the GETS, and stormwater treatment facilities. In addition, the GETS, surface water treatment systems, and proposed electricity-consuming cleanup technologies would be operated continuously as needed at any time of day. The existing office buildings would continue to be operated primarily during business hours, approximately 7:00 a.m. to 4:00 p.m. Monday through Friday. Therefore, the proposed electricity demand at the project site would occur throughout the SCE summer Mid-Peak and On-Peak demand periods and winter Mid-Peak demand period. As noted in the discussion for Impact 4.13-1, the equipment used for soil vapor extraction/air sparging, bioventing, and gaseous electron donor injection have the potential to use a substantial amount of electricity. The proposed soil vapor extraction system is estimated to consume approximately 6,000,000 kWh over 3 years. In addition, the consumption rate associated with thermal desorption is also anticipated to be substantial (e.g., 9,181,000 kWh over 172 days of operation for a system consisting of 101 electrodes). While it is anticipated that these technologies would consume substantial quantities of energy during the above-mentioned Mid-Peak and On-Peak demand periods, they would not result in the need for SCE to provide additional capacity to serve the project. SCE monitors and maintains a vast electricity system that provides electricity to 15 million people (SCE, 2016a). As an electricity supply company, SCE has the ongoing ability to generate or purchase energy based on demand within SCE's service area. To ensure energy availability and reliability for existing and future consumers, SCE engages in ongoing planning efforts that involve power use projections, system upgrades, and changes to their power mix (SCE, 2016a). **Table 5-6** shows the 2014 California Energy Demand Update (CEDU) mid scenario for SCE's electricity consumption and peak demand for selected years.

As shown in Table 5-6, SCE's energy demand is forecast to increase from 102,218 gigawatt hours (GWh) in 2016 to 113,612 GWh in 2025. This presents an increase of 11,394 GWh in

consumption. SCE's coincident peak demand is forecast to increase from 23,537 MW in 2016 to 26,030 MW in 2025. This presents an increase of 2,493 MW. While specific engineering/system design plans have not been specified for the electricity-consuming cleanup technologies, it can be assumed that even if three cleanup systems similar to the proposed SVE system were to be operated over the same 3-year period, approximately 18,000,000 kWh (18 GWh) would be consumed over 3 years. Thus, the proposed project's electricity usage is anticipated to be substantially lower than SCE's forecast demand and coincident peak demand for the SCE service area. It is anticipated that SCE would maintain the ability to provide energy to the proposed project and related projects with the variety and abundance of energy resources available to SCE. Therefore, this impact would not be cumulatively considerable

TABLE 5-6
CEDU 2014 MID CASE DEMAND BASELINE FORECASTS OF SCE ELECTRICITY DEMAND

Year(s)	*CEDU 2014 Mid Energy Demand*
Consumption (GWh)	
2016	102,218
2020	106,875
2024	112,247
2025	113,612
Average Annual Growth Rates	
2013-2016	0.99%
2013-2024	1.13%
2013-2025	1.13%
Coincident Peak (MW)	
2016	23,537
2020	24,724
2024	25,784
2025	26,030
Average Annual Growth Rates	
2014-2016	1.29%
2014-2024	1.17%
2014-2025	1.15%

Source: CEC, 2014b.

The project would consume substantial quantities of petroleum and electricity. However, the project is not expected to increase demand on local and regional energy supplies such that additional capacity would be needed. This impact would be a less-than-significant cumulative impact.

Mitigation

No mitigation measures are required.

Significance after Mitigation

The project, in combination with related projects, would not contribute considerably to energy consumption. Therefore, cumulative impacts to energy consumption would not be cumulatively considerable (less than significant).

5.6 Summary of Cumulative Impacts

As summarized in **Table 5-7**, upon incorporation of all mitigation measures, impacts of the proposed project would have the potential to combine with impacts of cumulative projects to result in cumulatively considerable (significant and unavoidable) impacts to Biological Resources, Cultural Resources, Hazards and Hazardous Materials, Land Use and Planning, and Noise.

TABLE 5-7
CUMULATIVE IMPACT SUMMARY

Impact	Cumulative Impact Determination	Significant Impacts	Mitigation Measures
Aesthetics	LTS	None	None
Air Quality	S&U	Adverse impact to air quality in the VCAPCD due to NOx emissions	AQ-1 and GHG-3
Biological Resources	S&U	Adverse effect on special status species (Braunton's milk-vetch and Santa Susana tarplant)	BIO-1 through BIO-23
Cultural Resources	S&U	Historical resources, unique archaeological resources, and tribal cultural resources	CUL-1 through CUL-19, BIO-2, BIO-5, BIO-12, and BIO-19
Geology, Soils, Seismicity	LTS	None	AQ-5, BIO 5, HYDRO-1, and GEO-1
Greenhouse Gases	LTS	None	AQ-5, EC-1, EC-2, and GHG 1 through GHG 3
Hazards and Hazardous Materials	S&U	Reasonably foreseeable upset and accident conditions involving hazardous materials	HAZ-1 through HAZ-5, HYDRO-1, HYDRO-2, and TRANS-1
Hydrology and Water Quality	LTS	None	None
Land Use and Planning	S&U	Conflicts with general plan policies intended to protect open space, air quality, and biological resources	AQ-1 through AQ-5, BIO-1 through BIO-23, GHG-1, HYDRO-1, HYDRO-2, HAZ-2, HAZ-3, and TRANS-1
Noise	S&U	Increases in ambient noise levels	NOISE-1 through NOISE-3
Transportation and Traffic	S&U	Conflict with applicable policies establishing measures of effectiveness for the performance of the circulation system	TRANS-1 and TRANS-2
Utilities and Services	LTS	None	None
Energy Consumption	LTS	None	None

S&U = Significant and unavoidable
LTS = Less than significant

CHAPTER 6
Alternatives

The overall site cleanup and initial activities have been described and analyzed in the previous chapters of this PEIR, with an emphasis on potentially significant environmental impacts and recommended mitigation measures to reduce those impacts. This chapter's purpose is to describe and analyze a range of reasonable alternatives that could feasibly attain most of the objectives of the project, while avoiding or substantially lessening any of the significant effects of the project (CEQA Guidelines, Section 15126.2(a)).[1] This chapter also discusses the environmental impacts associated with each alternative and compares the relative impacts of each alternative to those of the proposed project.

The goal of this alternatives analysis is to evaluate potential alternatives to implementing proposed cleanup activities, so that DTSC may make informed decisions. All alternatives carried forward for analysis in Section 6.3.2 would be consistent with the AOCs, except for Alternative 1, the No Project Alternative, which is required by CEQA Guidelines (Section 15126.6(e)). The purpose of describing and analyzing a No Project Alternative is to allow DTSC, as the decision maker, to compare the impacts of approving the proposed project with the impacts of not approving the proposed project.

6.1 Introduction

Under CEQA, the identification and analysis of alternatives to a project is a fundamental part of the environmental review process. PRC Section 21002.1(a) establishes the need to address alternatives in an EIR by stating that in addition to determining a project's significant environmental impacts and indicating potential means of mitigating or avoiding those impacts, "*the purpose of an environmental impact report is to identify the significant effects on the environment of a project, to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided*."

Direction regarding the definition of project alternatives is provided in CEQA Guidelines Section 15126.6(a) as follows:

> *An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but*

1 The terms "project" and "proposed project" are used throughout this section to maintain consistence with CEQA Guidelines, Section 15126.6. However, for this PEIR, the alternatives analysis is conducted on a combined program- and project-level basis as described in Section 2.1.1.

> *would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives*.

CEQA Guidelines emphasize that the selection of project alternatives should be based primarily on the ability to reduce impacts relative to the proposed project, "*even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly*" (Section 15126.6(b)). In addition, Section 15126.6(f) of the CEQA Guidelines further directs that the range of alternatives be guided by a "rule of reason," which requires the EIR to set forth only those alternatives necessary to permit an informed and reasoned choice by the lead agency, and to foster meaningful public participation.

In selecting project alternatives for analysis, potential alternatives must pass a test of feasibility. CEQA Guidelines Section 15126.6(f)(1) states that:

> *Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries…and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site*.

Beyond these factors, the CEQA Guidelines require the analysis of a No Project Alternative and an evaluation of alternatives to the project, if feasible. Based on the alternatives analysis, an Environmentally Superior Alternative is to be designated. If the Environmentally Superior Alternative is the No Project Alternative, then the EIR shall identify an Environmentally Superior Alternative among the other alternatives (CEQA Guidelines Section 15126.6(e)(2)). In addition, CEQA Guidelines Section 15126.6(c) requires that an EIR identify any alternatives that were considered for analysis but rejected as infeasible and discuss the reasons for their rejection.

6.1.1 Significant Environmental Effects

Potentially significant impacts of the proposed project can be mitigated to less-than-significant levels with the exception of the following significant and unavoidable impacts described in Chapter 4.0, *Environmental Setting, Impacts and Mitigation,* of this PEIR:

- Air Quality
  - Conflict with the implementation of applicable air quality plan
  - Violate ambient air quality standard
- Biological Resources
  - Adverse effect on Braunton's milk-vetch
  - Adverse effect on special-status species

- Cultural Resources
  - Adverse effect on archaeological sites qualifying as historical resources or unique archaeological resources
  - Adverse effect on tribal cultural resources
- Hazards and Hazardous Materials
  - Reasonably foreseeable upset and accident conditions
  - Located on a hazardous materials site
- Land Use
  - Conflicts with land use plans, policies or regulation
- Noise
  - Increase in ambient noise levels
- Transportation and Traffic
  - Conflicts with applicable plans, ordinances, or policies

6.1.2 Objectives of the Proposed Project

As discussion in Section 3.5, *Project Objectives*, of this PEIR, past activities at SSFL have resulted in the release of contaminants to soil and groundwater. DTSC has directed the RPs to investigate the nature and extent of the releases and implement corrective actions to clean up the affected areas. The primary objective of the proposed project is to implement SSFL cleanup under the 2007 Consent Order and the 2010 AOCs. As part of implementing the Orders, under Health & Safety Code 6.8, Section 25356.1, DTSC is required to base any decision on the USEPA National Contingency Plan and associated USEPA guidance documents to implement the 2010 Consent Order and the 2010 AOCs.

The DTSC overall project objectives are based on the National Contingency Plan (40 CFR 300.430 (e)(9)(iii)) criteria. These are grouped into three categories: primary, or "threshold", criteria; secondary, or "balancing", criteria; and additional "modifying" criteria.

Assessments against the following two of the criteria relate directly to statutory findings. Therefore, these are categorized as primary or "threshold criteria" that each alternative must meet:

1. Protect human health and the environment, attain soil and groundwater cleanup standards, and control of source(s) of releases. This can be done by ensuring exposure pathways are controlled, eliminated, or reduced through treatment, engineering controls, or institutional controls.
2. The cleanup for soil and groundwater must comply with applicable, relevant and appropriate laws, regulations and requirements.

To aid the decision making bodies in their review of the project and the environmental impacts and alternatives to the cleanup, the following criteria are assessed and considered:

3. Long-term effectiveness and reliability (after remedial activities are complete) in protecting human health and the environment (inclusive of surrounding communities) from exposure to materials containing contaminants above applicable cleanup requirements.
4. Reduction of toxicity, mobility, and/or volume of contaminated media.
5. Short-term effectiveness (during implementation/construction activities) in protecting human health and the environment (inclusive of surrounding communities) from exposure to materials with contaminants above applicable cleanup requirements.
6. Ability to implement the remedial activities, including feasibility to construct and operate, administrative feasibility and availability of services and materials.
7. Remediate the site in an expedient and cost-effective manner.
8. Community input during a formal public comment period on the cleanup decision document.

The following are some SSFL-specific elements of the above criteria:

- Prevent or minimize migration of contaminants to offsite areas.
- Implement the proposed project in a manner that is compatible with Ventura County's reasonably anticipated future land use designation of the property.
- Recognize the unique biological and cultural significance of the project site through protection of resources to the extent practicable and consistent with applicable laws and regulations for such resources.
- Use in situ methods, to the extent practicable, to minimize physical impacts to the environment.

6.2 Alternatives Considered and Rejected

An EIR must briefly describe the rationale for selection and rejection of alternatives. The lead agency (DTSC) may make an initial determination as to which alternatives are potentially feasible and, therefore, merit in-depth consideration, and which are infeasible and need not be considered further. Alternatives that are remote or speculative, or the effects of which cannot be reasonably predicted, need not be considered (CEQA Guidelines Section 15126.6(f)(3)).

After conducting public scoping meetings, public meetings regarding transportation options, and completing an environmental review disclosing potentially significant adverse impacts of the proposed project (see Chapter 4.0, *Environmental Setting, Impacts and Mitigation*, of this PEIR), DTSC identified a reasonable range of alternatives as defined by CEQA. A total of 12 alternatives, in addition to the No Project Alternative, were initially considered for evaluation. Of these 12, it was determined that four [2] would: (1) meet most of the project's objectives; (2) be considered potentially feasible, and (3) would avoid or substantially reduce

2 This was based on including two options presented in Section 6.3.2.4 as separate alternatives (Alternatives 4a and 4b).

one or more of the potentially significant impacts of the proposed project. These are analyzed in detail in Section 6.3, below. In addition, as required by CEQA, the No Project Alternative is described and analyzed in Section 6.3.

In accordance with CEQA Guidelines Section 15126.6(c), an EIR should identify any alternatives that were considered for analysis, but rejected as infeasible and briefly explain the reasons for their rejection. As noted above, alternatives may be eliminated from detailed consideration in the EIR if they fail to meet most of the project objectives, are infeasible, or do not avoid any significant environmental effects. The alternatives considered but rejected from further consideration are described below.

6.2.1 Encapsulation

As an alternative to soil excavation and hauling, DTSC received public comments regarding a potential alternative to encapsulate contaminated soils onsite. Encapsulation uses concrete or other impermeable materials to prevent the migration of contaminants. This alternative would significantly reduce truck trips since contaminated soil would not need to be taken offsite. Accordingly, it is assumed that the reduction of truck trips would significantly reduce air pollutant emissions, GHG emissions, traffic, and traffic noise. However, relying on encapsulation as the sole cleanup remedy was eliminated from further analysis, because it would not reduce the significant impacts associated with biological and cultural resources and land use, as the placement of encapsulation materials over large areas would permanently destroy vegetation, habitat, and cultural resources and would conflict with the Ventura County General Plan. In addition, encapsulation would permanently alter the visual quality of the project site, creating significant impacts to visual resources. Encapsulation would also result in greater impacts to hydrology on the site due to the installation of impermeable surfaces over large areas. Furthermore, encapsulation would not remove groundwater contamination. In addition, encapsulation would not be consistent with the 2010 AOCs (see Section 2.2.3.4, *2010 Administrative Orders on Consent*, of this PEIR). This prohibits the use of encapsulation for areas under the responsibility of NASA and DOE. Therefore, this alternative was eliminated from further consideration.

As stated in Section 3.6.1.6, *Capping and Onsite Management*, of the PEIR, the proposed project would include capping technologies; however, this would be limited to specific areas that are not amenable to other treatment options.

6.2.2 Treatment-in-Place

Treatment in place of all site contamination was considered as an alternative, based on public comment, as it would reduce many impacts associated with the proposed project (see Section 6.1.1, above) due to significantly reduced truck trips, including reduced air pollutant emissions, GHG emissions, land use, noise and traffic impacts. As stated in Section 3.6.1, the proposed project would include treatment-in-place cleanup technologies such as soil vapor extraction, biological treatment, phytoremediation, and physical cleanup. However, the project cannot solely rely on a treatment-in-place cleanup alternative, as not all the contaminants on the project site are

amendable to treatment-in-place technologies. For instance, there are no feasible treatment-in-place options for radioactive contaminants. Furthermore, not all contaminated soils onsite are amendable through treatment-in-place processes. Therefore, since treatment-in-place would not be suitable for the cleanup of all contaminants, this alternative was eliminated from further consideration.

6.2.3 Local Disposal

As shown in Table 3-6, potential disposal facilities are located at distances that range from 14 miles to 1,758 miles from the project site. This alternative considered disposing of all waste at a local landfill to reduce impacts associated with air pollutant emissions, GHG emissions, and traffic. However, as identified in Table 3-6, landfills are limited by the waste types they can accept. The closest landfill to the project site that can accept hazardous waste is approximately 180 miles away; however, this site cannot accept radioactive waste. The closest facility that can accept radioactive waste is the Nevada National Security Site approximately 337 miles from the project site. Therefore, limiting the disposal of cleanup-related wastes to a local facility would not be feasible. The RPs, under the direction of DTSC, would use a variety of factors to determine which disposal facilities to use, such as waste acceptance criteria, cost, proximity, landfill capacity, and availability, among other considerations. Therefore, this alternative was eliminated from further consideration.

6.2.4 Alternative Transportation Routes/Methods

As discussed in Section 2.4.2, a Transportation Feasibility Analysis was prepared to evaluate potential alternative routes and technologies to transport excavated soil from the project site. Based on that study, two alternative transportation options were selected for further analysis in this PEIR (see Section 6.3.2.4).

6.2.4.1 Alternative Haul Routes

The use of alternative haul routes to reduce or eliminate truck or conveyor trips to transport excavated soil from the site through residential areas along with alternative transportation methods was considered by DTSC. Currently, the only public roadway access to the SSFL site that is feasible for truck traffic is Woolsey Canyon Road. Because of public concern about traffic congestion, noise, air quality, and safety, related to increased truck traffic on Woolsey Canyon Road, DTSC considered alternative routes and methods to transport soil from the SSFL site to the regional transportation network. In August 2014, DTSC conducted two public meetings to solicit community input on additional types of transportation options (routes and methods) that should be considered for the project. A Transportation Feasibility Analysis was prepared based on information gathered at those meetings. The analysis reviews the practical feasibility, and possible complicating factors, of transporting contaminated soil from SSFL to nearby rail and highway corridors, for further transit to remote disposal facilities. The Transportation Feasibility Analysis is provided in Appendix J, of this PEIR.

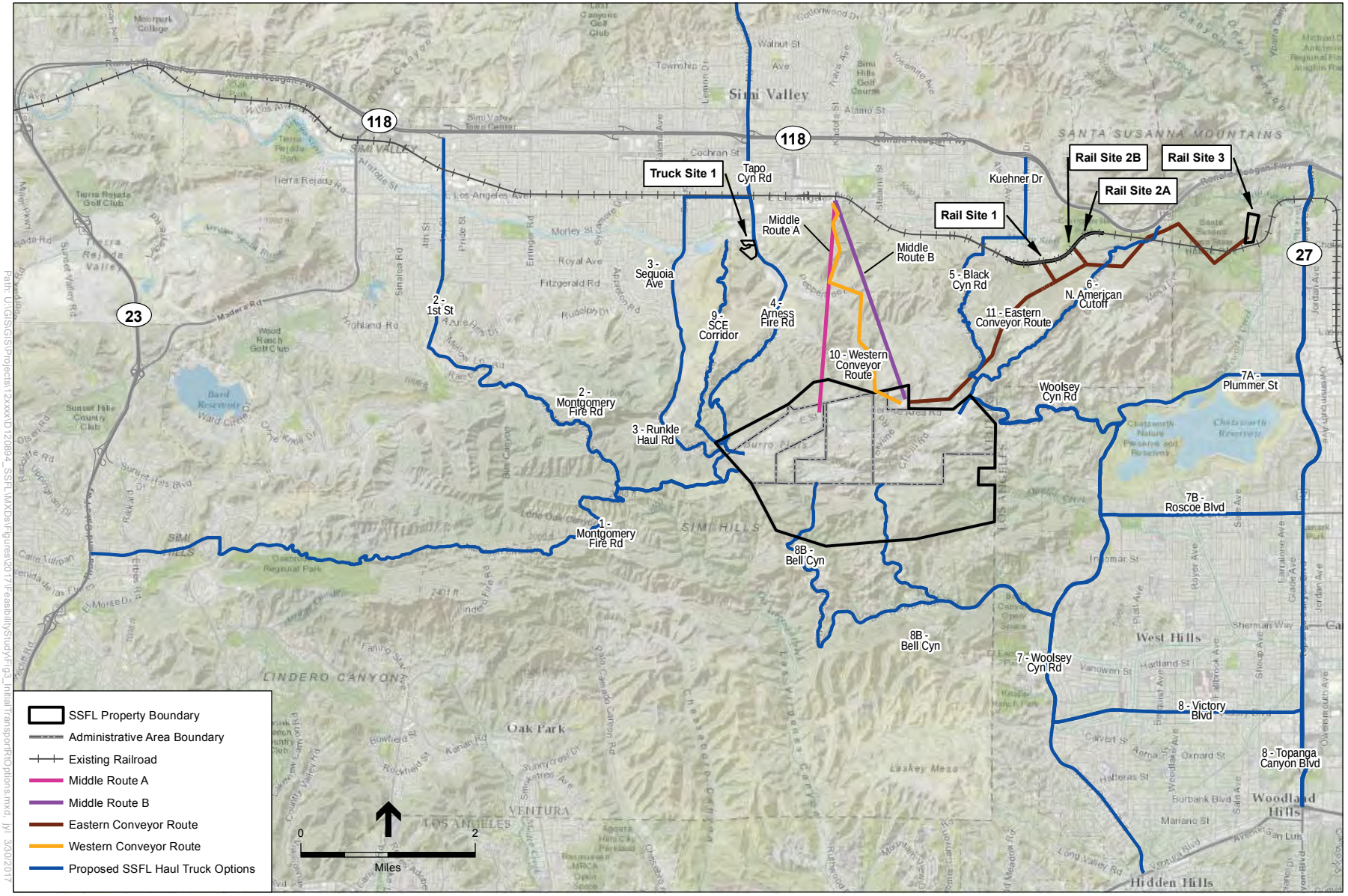
As discussed in the Transportation Feasibility Analysis, the following alternative roadways have the potential to serve as alternative haul routes, but were eliminated from further analysis for the reasons presented in **Table 6-1**. These haul routes are depicted on **Figure 6-1**.

TABLE 6-1
ALTERNATIVE HAUL ROUTES REJECTED FROM ANALYSIS

Alternative Haul Route	Map Number	Reason for Rejection from Alternatives Analysis
Montgomery Fire Road Truck Routes	1 and 2	Compared to the other routes considered, these routes would have some of the longest lengths of new roadway over current unpaved access roads and public/private lands. The length of the routes between SSFL and public roadways could be as long as 6.7 miles. Also, these routes would not connect to any rail transfer sites. Therefore, these routes were eliminated from further analysis.
Runkle Haul Road	3	This corridor would be constructed adjacent to and through a new residential tract. The outlet of the route at its northern connection to the public roadway network would be within a residential area on Sequoia Avenue. The presence of existing and future residential uses directly adjacent to the route and an increased number of miles on public roads, including those within residential areas, made this route less preferred than others. This route was therefore eliminated from further analysis.
Arness Fire Road	4	This corridor would have a northern connection with public roadways on Pepper Tree Lane, adjacent to an active youth camp. The route would parallel the campsite and would exit onto public roadways near the campsite. This route was eliminated from further analysis because of its direct proximity to the youth camp.
Black Canyon Road	5	This corridor, located primarily on public roadways, would offer a fairly direct route to SR 118 access points to the north of the SSFL site. Black Canyon Road, however, is a very curvy road through mountainous, hilly terrain, rendering long-term truck movements over this roadway infeasible. This route was therefore eliminated from further analysis.
Bell Canyon Road	8A and 8B	Potential routes from this roadway would provide access from the south side of the SSFL site, and would provide connections to Valley Circle Boulevard and/or Topanga Canyon Boulevard, with subsequent connections to US 101 or SR 118. A sizeable proportion of the route between the SSFL site and major public roadways would be via a private, gated neighborhood. Long-term truck hauling would not be feasible via this route. This route was therefore eliminated from further analysis.

6.2.4.2 Alternative Transportation Methods

The use of alternative transportation methods was also considered. **Table 6-2** presents the alternative transportation methods suggested by the public during two public meetings to solicit comments (see Section 2.4.4 of this PEIR) that were eliminated from further analysis. The table also includes an explanation for why each alternative was rejected. Further details about these methods are presented in the Transportation Feasibility Analysis provided in Appendix J of this PEIR. One alternative transportation method was selected for further analysis and is presented in Alternative 4. This technology consists of a new overland conveyor system constructed along either Edison Road or North American Cutoff Road. Details about the alternatives selected for further analysis are included in Section 6.3.2.



SOURCE: ESRI; ESA; KOA

Santa Susana Field Laboratory . 120894

Figure 6-1

Initial Transport Route Options

TABLE 6-2
ALTERNATIVE TRANSPORTATION METHODS REJECTED FROM ANALYSIS

Transportation Method	Reason for Rejection from Alternatives Analysis
Bi-modal canister	This option consists of using a shipping container that can be hauled by a truck and directly loaded onto a train. This option would require truck traffic to travel along Woolsey Canyon Road and would not eliminate or reduce the number of trucks accessing local roadways and would not reduce local air emissions or traffic volumes in residential areas. Thus, this option was eliminated from further analysis.
Helicopter / Air Lift / Cargo Plane / Blimp	Using aerial transport would not be feasible due to general logistics of loading and offloading aircraft as well as cost of air travel.
Slurry pipe	Use of a slurry pipe was determined to be infeasible due to logistics of mixing contaminated soil with water and creating, managing and disposing of contaminated water.
Truck to rail	Under this option all truck trips would travel to a rail transfer site via Woolsey Canyon Road, which would not eliminate or reduce the number of trucks accessing local roadways and would not reduce local air emissions or traffic volumes in residential areas. Thus, this option was eliminated from further analysis.
Tunnel	Construction of a tunnel to transport excavated material would involve significant ground disturbance and costs and has the potential to cause significant environmental impacts. This option would also not reduce potentially significant impacts of the proposed project. Therefore, this option was eliminated from further analysis.
Natural gas or non-diesel trucks	While alternative fuels and associated alternative-fueled equipment are available, such fuels and equipment are not feasible for implementation for this project. Natural gas is available in sufficient quantities, but the equipment available is currently limited to a few manufacturers or still in the prototype stage. Therefore, there is insufficient availability of natural gas fueled trucks for hauling materials from the SSFL site to appropriate receiver facilities and would not be feasible for this project. In addition, electric engines were considered; however, due to the daily relocation of equipment throughout the SSFL site and the need for trucks to travel long distances away from the SSFL site, lack of charging stations in proximity to daily cleanup locations, and downtime for recharging, electric equipment was determined to not be feasible for this project.
Rail-Veyor	A Rail-Veyor is a proprietary compact autonomous train system that operates on its own elevated track system. This method would be constructed as a track system that curves and rises/falls with the local topography and materials would be carried on individual sets of cars as trains that use the rail system for propulsion and guidance. This method is not considered to be feasible because of the need to establish curving track on significant vertical grades present in the vicinity of the SSFL site, and the limited capacity that could be provided due to the non-continuous flow operation (via single-trains running on single tracks) unlike what a conventional ground-based conveyor could provide.
Barges	The use of a barge would not be feasible due to lack of access to waterways at or near the SSFL site.
Conveyor to truck	The use of a conveyor system that would unload onto a truck site would reduce truck trips in residential areas. However, the alternatives analysis considers the use of a conveyor system that unloads onto a rail yard where material could be shipped to a disposal facility by rail. The conveyor option selected for further analysis would result in potentially fewer impacts than the conveyor to truck option. Therefore, this option was eliminated from further analysis.

Transportation Method	Reason for Rejection from Alternatives Analysis
Rail from project site	It would not be feasible to locate a rail transfer facility on the SSFL site due to the significant vertical grades present in the vicinity of the site. Also this option would have limited capacity due to the non-continuous flow operation (via single-trains running on single tracks); unlike what a conventional ground-based conveyor could provide.
Sky-way or aerial tram	The use of a sky-way or aerial tram that would unload onto a truck in an offsite area would reduce truck trips in residential areas. However, the alternatives analysis considers the use of a conveyor system that unloads onto a rail yard where material could be shipped to a disposal facility by rail. The conveyor option selected for further analysis would result in potentially fewer impacts because the aerial tram option would result in significant airspace penetration. In addition, an aerial tramway may not be allowed under existing zoning in the vicinity of the project site due to local structural height restrictions. Therefore, this option was eliminated from further analysis.
Truck and container option (i.e., truck to rail)	This option is similar to the truck to rail option described above and is not considered for further analysis, because it would require use of existing roadways to haul contaminated soil to a rail yard. This option would not avoid adding vehicle traffic to local residential roads.
Super scooper	A super-scooper is an airplane that can load water into its payload area as it skims a water body for use in fighting wildfires. There are no known uses of this method for soil transport. Therefore, this option is considered infeasible.

6.2.5 Future Land Use Alternative

A Future Land Use Alternative was eliminated from further consideration as potential development of the site is not part of the proposed project. The purpose of the project is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. When overseeing cleanup actions that are protective of human health and the environmental consistent with USEPA regulations (OSWER Directive 9355.7-19, March 17, 2010), DTSC typically considers the reasonably anticipated future land use of the site during the remedy selection process. The proposed project would not change the current use of the site and the proposed cleanup level would not conflict with the allowable uses identified for the RA-5, AE-40 and OS-160 zones. Any future development may be subject to other discretionary actions by the County of Ventura, DTSC, or other government agencies, including environmental review as appropriate pursuant to CEQA. Therefore, this alternative was eliminated from further consideration.

6.2.6 Onsite Disposal Cell

The construction of an agency-permitted, onsite disposal cell (liner beneath and cap above non-hazardous soils) was considered as an alternative to the proposed project, but rejected from further analysis. This alternative would result in non-hazardous soils excavated from Area I and Area III being deposited at an onsite facility. This alternative has the potential to reduce truck trips. Accordingly, the reduction of truck trips would reduce impacts related to air pollutant emissions, GHG emissions, traffic, and traffic noise. However, this alternative would not reduce significant impacts associated with biological resources, cultural resources, and land use because

soil excavation would still occur throughout the project site and within the same areas as the proposed project. In addition, the onsite disposal cell would permanently alter the visual quality of the project site, creating significant impacts to visual resources. The onsite disposal cell could also result in greater impacts to hydrology due to the placement of excavated soils. Therefore, this alternative was eliminated from further analysis.

6.2.7 Area I and III Cleanup to Background

An alternative to cleanup to background levels in Areas I and III was considered but eliminated from further analysis. This alternative has the potential to increase impacts associated with an increase in the quantity of soil to be excavated and removed from the project site, which would significantly increase truck trips. An increase in truck trips would increase significant and unavoidable impacts related to air pollutant emissions, GHG emissions, traffic, and traffic noise. In addition, an increase in the quantity of excavated soil has the potential to increase impacts to cultural and biological resources, which also results in conflict with the Ventura County General Plan goals and policies regarding preservation of natural resources. However, this alternative was eliminated from further analysis because it is inconsistent with the soil cleanup requirements included in the 2007 Consent Order as described in Section 3.3, *Regulatory Orders and Cleanup Requirements*, of this PEIR.

6.2.8 Risk-Based Cleanup Standard

Risk-based cleanup alternatives for the NASA and DOE portions of the site were considered but rejected from further analysis, as this alternative would not meet the cleanup standards of the 2010 AOCs. Risk-based cleanup levels are determined following methods outlined in DTSC-approved SRAM Work Plan Addendum Revision 2 (summarized in Section 2.2.3.2, *Standardized Risk Assessment Methodology*, of this PEIR). This alternative would clean up the project site to either a "Suburban Resident – Excluding Consumption of Garden Produce" exposure scenario or "Recreator" exposure scenario (see Appendix B) and has the potential to substantially reduce the quantity of soil to be excavated and removed from the project site, which would significantly reduce truck trips. A significant reduction in truck trips would reduce significant and unavoidable impacts related to air pollutant emissions, GHG emissions, traffic, and noise. In addition, a reduction in the quantity of excavated soil has the potential to reduce impacts to cultural and biological resources as well as conflicts with the Ventura County General Plan. However, this alternative was eliminated from further analysis because it is inconsistent with the soil cleanup requirements of the 2010 AOCs described in Section 3.3, *Regulatory Orders and Cleanup Requirements*, of this PEIR.

6.2.9 GETS Effluent Pipeline to Municipal Treatment Facility Alternative

Under this alternative, discharge of treated groundwater into Surface Water Outfalls 019 and 020 and injection of treated groundwater into the Chatsworth formation aquifer (see Section 3.6.3.1, *Groundwater Extraction and Treatment System (Pump and Treat)*, of this PEIR) would not occur. Instead, an effluent pipeline would be constructed to connect the GETS to existing wastewater

pipeline infrastructure to deliver treated water to a municipal wastewater treatment facility. This alternative was eliminated from further analysis because it would not reduce significant impacts identified in this PEIR and would result in greater ground disturbance than the proposed project. This would result in increased impacts to biological and cultural resources.

6.2.10 Boeing Cleanup to Suburban Residential Excluding the Consumption of Garden Produce

One possible alternative is a risk-based cleanup alternative for the Boeing Areas I and III that applies the residential exposure and assumes none of the residents produce diet comes from consumption of homegrown produce. This alternative was considered but rejected from further analysis, as this alternative would not meet the cleanup standards of the 2007 Consent Order. Risk-based cleanup levels are determined following methods outlined in DTSC-approved SRAM Work Plan Addendum Revision 2 (summarized in Section 2.2.3.2, *Standardized Risk Assessment Methodology*, of this PEIR). This alternative would clean up the project site to a "Suburban Resident – Excluding Consumption of Garden Produce" exposure scenario (see Appendix B). DTSC considered Suburban Residential with a Garden Pathway as one cleanup scenario. The SRAM bifurcated the computation of risks for Suburban Residential with a Garden Pathway because of "significant uncertainty" involved in computing the risk numbers for the Garden Pathway (MWH, 2014).

A Suburban Residential scenario without a Garden Pathway has the potential to reduce the quantity of soil to be excavated and removed from the project site, which would reduce truck trips. A reduction in the quantity of excavated soil has the potential to reduce impacts to cultural and biological resources, which is consistent with the Ventura County General Plan goals. However, this alternative was eliminated from further analysis because the alternative is inconsistent with the soil cleanup requirements of the 2007 Consent Order, described in Section 3.3, *Regulatory Orders and Cleanup Requirements* of this PEIR, and the potential zoning scenarios identified by Ventura County. In addition, the reduced volume estimate for this alternative is already covered under the estimated volume for the Boeing cleanup, and the volume reduction would be minimal to the overall program volume.

6.2.11 Boeing Cleanup to Suburban Residential with 100 Percent Consumption of Garden Produce

Another possible alternative is to clean up Boeing Areas I and III for use as residential property and for exposure to assume that all of the residents consume produce grown onsite and in soil after remediation. This alternative was considered but rejected because it is not consistent with the reasonably anticipated land use for the site. This alternative has the potential to require an increase in the quantity of soil to be excavated and removed from the project site, resulting in greater impacts due to the increased number of truck trips. An increase in truck trips would increase significant and unavoidable impacts, including those related to air pollutant emissions, GHG emissions, traffic, and traffic noise. In addition, an increase in the quantity of excavated soil has the potential to increase impacts to cultural and biological resources, which also results in conflict with the Ventura County General Plan goals and policies regarding preservation of natural resources.

6.3 Alternatives Selected for Analysis

The alternatives analysis has been prepared to evaluate the potential for reducing the project's significant impacts, as well as to address comments received during the scoping process. Pursuant to Section 15126.6(a) of the CEQA Guidelines, the alternatives selected for analysis identified below, with the exception of the required No Project Alternative, would feasibly attain most of the basic project objectives, and have the potential to avoid or substantially lessen the significant effects of the proposed project. These alternatives are also considered potentially feasible to implement. The following alternatives have been selected for detailed analysis and are described in Section 6.3.2:

- Alternative 1: No Project Alternative
- Alternative 2: Preliminary Estimated AOC Exceptions Alternative
- Alternative 3: Reduced Truck Trip Scenario
- Alternative 4: Transportation Alternatives
  - Alternative 4a: Edison Road Overland Conveyor
  - Alternative 4b: North American Cutoff Overland Conveyor

6.3.1 Analysis Format

In accordance with Section 15126.6(d) of the CEQA Guidelines, each alternative is evaluated in sufficient detail to determine whether the environmental impacts would be less than, similar to, or greater than the corresponding impacts of the project. Furthermore, each alternative is evaluated to determine whether the Project Objectives (see Section 6.1.2 of this PEIR) would be substantially attained by the alternative. The evaluation of each alternative follows the process described below:

- A description of the alternative.
- The net environmental impacts of the alternative before and after implementation of reasonable mitigation measures for each environmental issue area analyzed in the Draft PEIR are described.
- Post-mitigation and less than significant environmental impacts of the alternative and the project are compared for each environmental topic area. Where the environmental impact of the alternative would be clearly less than the impact of the project, the comparative impact is said to be "less." Where the alternative's net environmental impact would clearly be more than the project, the comparative impact is said to be "greater." Where the environmental impacts of the alternative and project would be roughly equivalent, the comparative impact is said to be "similar." The evaluation also documents, whether compared to the project, an impact would be entirely avoided, whether a significant impact could be reduced to a less-than-significant level, or whether a significant unavoidable impact could be reduced in a meaningful way even if the reduction would not be sufficient to render the impact less than significant.
- The comparative analysis of the environmental impacts is followed by a general discussion of the extent to which the underlying purpose and Project Objectives are attained by the alternative.

Table 6-3, which follows the alternative analysis, provides a comparative summary of the environmental impacts anticipated under each alternative to the environmental impacts associated with the project. Pursuant to Section 15126.6(c) of the CEQA Guidelines, the analysis below addresses the ability of the alternatives to "avoid or substantially lessen one or more of the significant effects" of the project. In addition, a discussion regarding the ability of the alternatives to meet the Project Objectives is provided. Finally, pursuant to CEQA Guidelines Section 15126.6(e)(2) an Environmentally Superior Alternative is identified.

6.3.2 Alternative Analysis

The purpose of the alternatives analysis in an EIR is to consider means to avoid or lessen significant impacts to the project. Therefore, the analysis below compares the potential impacts of alternatives to those identified for the project.

6.3.2.1 Alternative 1 – No Project Alternative

The No Project Alternative represents a continuation of the existing conditions at the project site. Under this alternative, no further action would be taken to treat or remove the impacted onsite soils and groundwater beyond current monitoring and maintenance activities. Operation of the existing GETS would continue under this alternative. All other existing site features would remain. This alternative would not meet state and federal requirements for cleanup of the site.

The No Project Alternative is required pursuant to Section 15126.6(e)(2) of the CEQA Guidelines, which states that the No Project Alternative shall:

> *discuss the existing conditions at the time the notice of preparation is published, or if no notice of preparation is published, or if no notice of preparation is published, at the time the environmental analysis is commenced, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.*

The existing conditions at the time the NOP (November 22, 2013) included ongoing investigation and monitoring of soil and groundwater contamination, demolition of some NASA-owned structures, and operation of surface and groundwater treatment systems (see Section 3.4, *Environmental Setting*, of this PEIR).

Environmental Impacts

Aesthetics

The No Project Alternative would not involve excavation, the use of construction equipment, or other activities that would change the existing visual quality of the site. Under this alternative existing man-made infrastructure and features would remain and revegetation activities associated with the proposed project would not occur. The No Project Alternative would avoid the impacts to aesthetic resources that would occur under the proposed project and no mitigation would be required. Therefore, impacts would be less under the No Project Alternative than those identified for the proposed project.

Air Quality

The No Project Alternative would not involve excavation, the use of construction equipment, increased truck and vehicle trips or other activities that would result in new sources of air pollutant emissions that would occur under the proposed project. The No Project Alternative would avoid the significant and unavoidable air quality impacts that would result from implementation of the proposed project and no mitigation would be required. Therefore, impacts would be less under the No Project Alternative than those identified for the proposed project.

Biological Resources

The No Project Alternative would not involve any new ground disturbance or other activities that would change existing conditions with respect to biological resources. The No Project Alternative would avoid the significant and unavoidable biological impacts that would result from implementation of the proposed project and no mitigation would be required. Therefore, impacts would be less under the No Project Alternative than those identified for the proposed project.

Cultural Resources

The No Project Alternative would not involve excavation or ground disturbance by other means. Therefore, this alternative would have no potential to encounter or disturb subsurface cultural resources, such as archaeological, human remains, or tribal cultural resources, which may occur under implementation of the proposed project. Furthermore, no historical resources would be affected under the No Project Alternative. The No Project Alternative would avoid the significant and unavoidable impacts to cultural resources that would result from implementation of the proposed project and no mitigation would be required. Therefore, impacts would be less under the No Project Alternative than those identified for the proposed project.

Geology and Soils

Under the No Project Alternative, no excavation or ground disturbance by other means would occur at the project site. Existing conditions with respect to geology and soils would remain the same. The No Project Alternative would avoid the potential impacts involving geology and soils that would result from implementation of the proposed project and no mitigation would be required. Therefore, impacts would be less under the No Project Alternative than those identified for the proposed project.

Greenhouse Gas Emissions

The No Project Alternative would not involve excavation, soil hauling or other activities that would produce GHG emissions in excess of existing conditions. The No Project Alternative would avoid the less than significant GHG impacts that would result from implementation of the proposed project and no mitigation would be required. Therefore, impacts would be less under the No Project Alternative than those identified for the proposed project.

Hazards and Hazardous Materials

Under the No Project Alternative, the project site would not be cleaned up. Existing contaminants would remain and applicable soil and groundwater cleanup requirements would not be implemented, with the exception of the existing GETS. Existing activities to prevent migration of

contaminants offsite would continue. However, hazards that would result from excavation and hauling contaminated soil would also not occur. Accordingly, the proposed project's impacts related to hazards associated with the transport, disposal, and use of hazardous materials would not occur under the No Project Alternative nor would impacts related to reasonably foreseeable upset and accident conditions. The No Project Alternative would also not transport contaminated soils along haul routes within a quarter mile of schools, nor interfere with an emergency response plan. Under the No Project Alternative, wildfire risks would remain the same as existing conditions. Unlike the proposed project, the No Project Alternative would not use chemical amendments for the treatment of chemicals in soil and/or groundwater. However, given that the No Project Alternative would not implement any additional soil and groundwater cleanup activities (with the exception of the GETS), hazardous materials would remain onsite. Therefore, impacts would be greater than those identified for the proposed project.

Hydrology and Water Quality

Under the No Project Alternative, the project site, including groundwater, would not be cleaned up beyond what is currently occurring with the GETS. No excavation, removal of contaminated soils, or groundwater treatment would occur and groundwater and surface water could be degraded. The applicable soil and groundwater cleanup requirements would not be implemented. No mitigation would be required. Existing conditions would remain the same. The No Project Alternative would avoid potential excavation-related impacts associated with water quality, soil erosion, alteration of drainage patterns, or increased runoff volumes associated with the project. With the exception of the GETS, the potential beneficial impacts to water quality that would result from the proposed project's groundwater and soil cleanup would not occur under the No Project Alternative. Therefore, impacts would be greater than those identified for the proposed project.

Land Use and Planning

Under the No Project Alternative, existing conditions would remain the same. There would be no activities that would conflict with applicable resource or land use plans. The No Project Alternative would avoid the proposed project's significant and unavoidable impacts with respect to land use plan consistency and no mitigation would be applicable. However, the remaining contamination would prevent or alter future reuse at the site and would conflict with Ventura County General Plan. Therefore, impacts would be greater than those identified for the proposed project.

Noise

Under the No Project Alternative, the use of construction equipment and soil hauling would not occur, and there would be no new sources of noise within the project site or along existing roadways. Therefore, the No Project Alternative would avoid the proposed project's potentially significant and unavoidable noise impacts along haul routes and at the existing campsites and ranger's house at Sage Ranch Park. No mitigation under the No Project alternative would be required. Therefore, impacts would be less than those identified for the proposed project.

Transportation and Traffic

The No Project Alternative would not generate any new sources of traffic. There would be no additional employee or truck trips associated with cleanup activities. Because the No Project Alternative would not generate any new traffic, it would avoid the proposed project's less-than-significant impacts with respect to traffic, traffic plans, and traffic safety and no mitigation would be required. Therefore, impacts would be less than those identified for the proposed project.

Utilities and Services Systems

Under the No Project Alternative, no excavation and disposal of contaminated soils would occur. Therefore, no soils would be disposed of at solid waste facilities. The No Project Alternative would avoid the less-than-significant impacts involving solid waste that would occur under the proposed project and no mitigation would be required. Therefore, impacts would be less than those identified for the proposed project.

Energy Conservation

Under the No Project Alternative, no excavation, removal of contaminated soils, or groundwater treatment would occur. As such, no new demand for petroleum or electricity would be generated. The proposed project's less-than-significant impacts with respect to energy conservation would be avoided and no mitigation would be required. Therefore, impacts would be less than those identified for the proposed project.

Relationship of the Alternative to Project Objectives

The No Project Alternative would not meet most of the project objectives, including the primary objectives to clean up soil and groundwater contaminants in compliance with applicable regulatory standards and the protection of human health and the environment. The No Project Alternative would not meet the objectives to prevent or minimize migration of media containing contaminants to offsite areas; use in situ cleanup methods, to the extent practicable, to minimize physical impacts to the environment; or remediate the site in an expedient and cost-effective manner. The No Project Alternative would be consistent with the objective of recognizing the unique biological and cultural significance of the project site through protection of resources to the extent practicable and consistent with applicable laws and regulations for such resources. The No Project Alternative would not be compatible with Ventura County's land use designation of Open Space for the property.

6.3.2.2 Alternative 2: Preliminary Estimated AOC Exceptions Alternative

As discussed in Section 3.3.1, *Soils*, of this PEIR, both the 2007 Consent Order and 2010 AOCs state that actions taken pursuant to the orders must be taken in accordance with local, state, and federal laws, which would include laws and regulations related to protecting biological resources (habitat or species protected under the federal and California Endangered Species Acts) or cultural resources (e.g., Native American artifacts). Alternative 2 estimates the areas that could be exceptions to the cleanup standards established in the AOCs for areas that contain significant cultural and biological resources. AOC exceptions could also be applied where needed to ensure compliance with the National Historic Preservation Act, Endangered Species Act, California

Endangered Species Act, Clean Water Act, California streambed alteration requirements, local biological protection regulations, and the California Porter-Cologne Water Quality Control Act. **Figure 6-2** shows the areas where the proposed estimated AOC exceptions could be applied. All other components would remain the same as the proposed project. The primary difference between the alternative and the proposed project is that soil volumes and areas to be disturbed would be modified (reduced), based on preliminary estimates of where exceptions for significant cultural and biological resources would be applied.

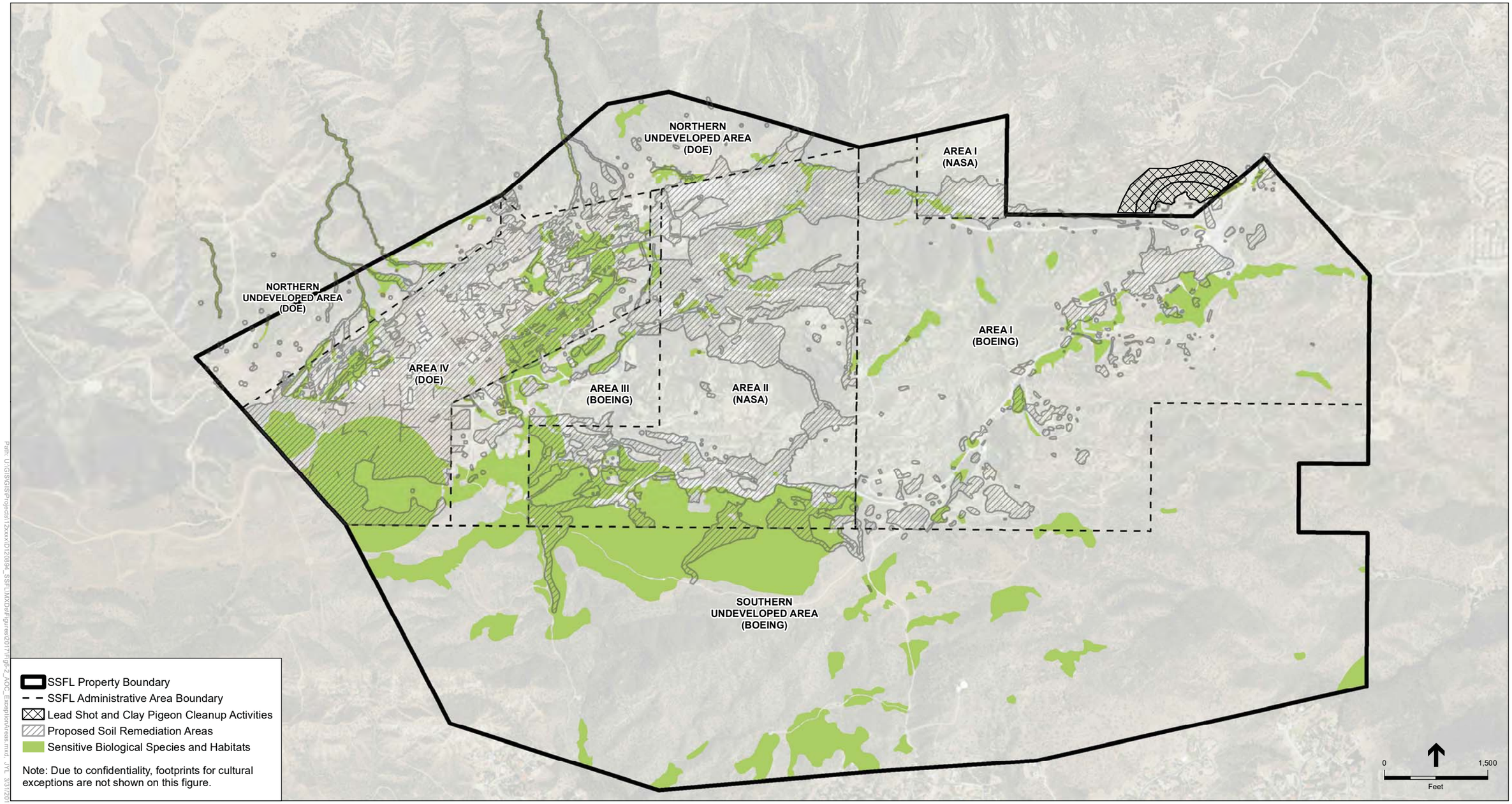
Environmental Impacts

Aesthetics

Although there are no designated scenic vistas within the project site, Sage Ranch Loop Trail is considered a scenic vista because it is a focal point for recreational visitors and is within close proximity to Area I. Although this alternative would reduce the amount of land disturbance with application of the AOC exceptions, land disturbance would still occur in Area I. Given that land disturbance would occur Area I, which is within close proximity to a scenic vista, it is anticipated that impacts would be similar to the proposed project and that the same mitigation measures would be implemented. Thus, Alternative 2 would result in a less-than-significant impact with mitigation incorporated with respect to scenic vistas, similar to the proposed project.

As identified in Section 4.1, *Aesthetics*, of this PEIR, the project site is not located within the vicinity of a designated state scenic highway and, therefore, would not damage scenic resources, such as a tree, rock outcropping, or historic buildings, within a designated state scenic highway. However, the nearby SR 118, approximately, 2.5 miles north of the project site, is an Eligible State Scenic Highway. As described in Section 4.1.1, *Environmental Setting*, motorist views from SR 118 are typically brief in duration, while in many instances views are completely screened by intervening topography and vegetation. Furthermore, this alternative would reduce the amount of land disturbance with application of the AOC exceptions and, thus, the view of the project site from SR 118 would be further reduced. Similar to the proposed project, cleanup of the project site under Alternative 2 would not result in substantial damage to scenic resources within a designated state scenic highway. Therefore, this impact would be less than significant and reduced when compared to the proposed project.

The quantity of land that would be disturbed under Alternative 2, would be substantially reduced compared to the proposed project, as application of the AOC exceptions would result in avoidance of native habitat and plant communities, along with cultural resources. These resources contribute to the visual quality of the site. Alternative 2 would reduce the project's potential to degrade the existing visual or community character or quality of the site and its surroundings, because significantly less ground disturbance would occur compared to the proposed project. The mitigation measures identified for the proposed project that would reduce impacts to aesthetics would also be applicable to Alternative 2. With the implementation of mitigation measures, impacts on the community character or quality of the site and its surroundings would be less than significant and reduced when compared to the proposed project.



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SOURCE: DOE 2015; MWH 2016; USFWS 2016; ESA 2016

Santa Susana Field Laboratory.120894

Figure 6-2

Preliminary Estimated AOC Exceptions Alternative

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Similar to the proposed project, Alternative 2 would not create a new source of substantial light or glare in the project vicinity or increase backscatter of light into the nighttime sky. Construction activities would occur 5 days per week (Monday through Friday), 11 hours per day, from 7:00 a.m. to 6:00 p.m. Under this alternative, nighttime security lighting at construction laydown areas may be necessary; however, with the exception of recreationists within Sage Ranch Park, which is only accessible during daylight hours, the project site is generally not visible to the public. Given that this alternative would reduce the amount of land disturbance with application of the AOC exceptions, it would reduce light impacts as compared to the proposed project, because less land disturbance would occur that would require lighting and the cleanup schedule would be reduced. Thus, this impact would be less than significant and reduced when compared to impacts identified for the proposed project.

Air Quality

As described in Section 4.2, *Air Quality*, of this PEIR, the proposed project would be consistent with the VCAPCD's and SCAQMD's AQMPs if it does not result in population growth above the most recently adopted AQMP or is consistent with the emission reduction strategies included in the AQMP. Similar to the proposed project, Alternative 2 is a soil and groundwater remediation project and would not result in any population growth within the project area. However, similar to the proposed project, Alternative 2 would conflict with the VCAPCD's and SCAQMD's AQMPs reduction strategies in that the emissions would exceed the regulatory thresholds for NO_X within each of the air basins. While the duration of cleanup activities and the amount of material being hauled to and from the project site would be reduced under this alternative, the maximum number of daily truck trips would be the same as the proposed project and, as such, would create a similar significant impact. Even with the implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, and HAZ-2, emissions for this alternative would not be reduced to below VCAPCD's thresholds with the VCAPCD AQMP's goal of reducing regional pollutant emissions consistent with the SIP. With mitigation, Alternative 2's NOx emissions would be below applicable SCAQMD regional thresholds and, thus, would not conflict with SCAQMD's AQMP. However, because the proposed project would be in conflict with the VCAPCD's AQMP, this impact would be significant and unavoidable, similar to the proposed project.

As described above, Alternative 2 would remove less impacted soil for offsite remediation than the proposed project, and, therefore, would reduce vehicle miles traveled associated with the export of soils. Daily emissions, however, are unlikely to deviate from the anticipated emissions from the proposed project. This alternative would not limit the number of truck trips per day, so the daily maximum emissions would remain the same, though the project duration would be reduced. Nevertheless, under Alternative 2, the onsite equipment usage would result in a potentially significant impact for NO_X within both VCAPCD and SCAQMD jurisdictions, but would be below the VCAPCD threshold for ROG and SCAQMD thresholds for VOC, CO, SO_x, PM_{10}, and $PM_{2.5}$. Thus, the same mitigation measures identified for the proposed project would be applicable. However, even with implementation of these mitigation measures, Alternative 2 would have significant and unavoidable impacts, similar to the proposed project.

Similar to the proposed project, Alternative 2 would generate onsite and offsite construction emissions that have the potential to expose nearby sensitive receptors to substantial pollutant concentrations of CO, NOx, PM_{10}, $PM_{2.5}$, and toxic air contaminants. However, Alternative 2 would not expose sensitive receptors to substantial pollutant concentrations. Therefore, the proposed project would not result in significant CO impacts or impacts with respect to localized NOx, CO, PM_{10}, and $PM_{2.5}$, and the impacts would be less than significant. Given the reduced schedule, impacts would be slightly reduced compared to the proposed project.

Similar to the proposed project, Alternative 2 would have a significant and unavoidable cumulative impact with respect to air quality because Alternative 2 would be inconsistent with the applicable air quality management plans. Although the same mitigation prescribed for the proposed project would also be applicable to Alternative 2, cumulative air quality impacts would remain significant and unavoidable after incorporation of mitigation, similar to the proposed project.

Similar to the proposed project, during remediation activities for Alternative 2, exhaust from equipment may produce discernible odors typical of most construction sites. However, odors would be temporary and dissipate with distance and, thus, would not have the potential to affect the nearby sensitive receptors to the north, east, and south. Furthermore, while not mandatory to reduce impacts, Mitigation Measure HAZ-2 would be implemented to reduce the potential for odors associated with remediation activities to leave the site. Therefore, impacts related to odors from remediation activities under Alternative 2 would be less than significant. Given the reduced duration of construction under this alternative, impacts would be reduced compared to the proposed project.

Biological Resources

Under Alternative 2, site disturbance would be reduced with implementation of the AOC exceptions. The AOC exceptions would be applied based, in part, on the presence of significant biological resources and to ensure compliance with the Endangered Species Act, California Endangered Species Act, Clean Water Act, California streambed alteration requirements, and California Porter-Cologne Water Quality Control Act. Therefore, compared to the proposed project, Alternative 2 would reduce impacts to Braunton's milk-vetch and other special-status species. Prior to vegetation or ground disturbance, USFWS- and CDFW-approved botanists/biologists would delineate critical habitat and habitat occupied by sensitive biological resources (Braunton's milk-vetch and Santa Susana tarplant) for avoidance. With application of these exceptions, adverse effects to the sensitive natural communities would be identified and avoided to the maximum extent possible. However, these exception areas do not guarantee that the sensitive natural communities would be entirely avoided. Similar to the proposed project, Alternative 2 would be required to implement the same mitigation measures (BIO-1 through BIO-23) as those required for the proposed project. However, even with implementation of these mitigation measures, impacts to Braunton's milk-vetch and special-status species would be significant and unavoidable, although reduced in comparison to the significant and unavoidable impact identified for the proposed project.

Under Alternative 2, soil remediation activities associated with the proposed project would avoid various aquatic/riparian habitats, as well as sensitive upland habitats, including chaparral, coast live oak woodland, Southern California walnut woodland, Venturan coastal sage scrub, steep dipslope grassland, and vegetated rock outcrops, that would be impacted under the proposed project. Therefore, impacts would be less than significant and reduced when compared to the proposed project.

Federally and/or state-protected wetlands and waters within the project site may include streams and drainages (i.e., riverine habitat), ponds/open water, seeps, vernal pools, marshes and other wetlands, and riparian vegetation. Site disturbance under Alternative 2 would be reduced with the AOC exceptions and, thus, impacts to potential jurisdictional resources resulting from soil remediation activities include disturbance or loss of habitat, as well as alterations to site hydrology (i.e., soil removal or grading along or near stream channels) which, in turn, would impact additional habitat areas offsite and/or downstream would be reduced. However, these exception areas do not guarantee that the potential jurisdictional resources would be entirely avoided. Therefore, similar to the proposed project, Alternative 2 would be required to implement Mitigation Measures BIO-4 and BIO-21. With implementation of these mitigation measures, the proposed project would not have a substantial adverse effect on federally or state protected wetlands and waters. Impacts under Alternative 2 would be less than significant and reduced in comparison to the proposed project.

As described in Section 4.3, *Biological Resources*, of this PEIR, the eastern strand of the Santa Monica-Sierra Madre Landscape Linkage, a wildlife migration corridor, runs through Area I of the project site. While Alternative 2 would reduce the areas being excavated on the project site, it would contain large exception areas within Area I and, thus, conditions would be similar to the proposed project. As such, the mitigation measures identified for the proposed project (BIO-12, BIO-16, and BIO-22) would be applicable to Alternative 2 as well. Implementation of these mitigation measures would not interfere with the movement of any native resident or migratory fish or wildlife species, migratory wildlife corridors, or impede the use of native wildlife nursery sites. Therefore, potential impacts under Alternative 2 would be less than significant and reduced in comparison to the proposed project.

Similar to the proposed project, Alternative 2 would conflict with local goals, objectives and policies that include the Ventura County Tree Protection Ordinance, Ventura County Oak Woodlands Management Plan, and the Ventura County General Plan. Implementation of Mitigation Measures BIO-1 through BIO-23 would minimize impacts to sensitive biological resources that would occur as a result of cleanup activities. Therefore, the cleanup activities associated with Alternative 2 would conflict with local policies or ordinances protecting biological resources; however, impacts would be reduced in comparison to the proposed project.

The project site is not located within an adopted or approved habitat conservation plan or natural community conservation plan. Therefore, Alternative 2 would not conflict with the provisions of an adopted or approved habitat conservation or natural community conservation plan and there would be no impact, similar to the proposed project.

Cultural Resources

As described above, Alternative 2 would implement exceptions to the cleanup standards established in the AOCs for areas that contain Native American artifacts recognized as cultural resources. As such, impacts to cultural resources would be reduced compared to the proposed project, due to a reduction in site disturbance. Specifically, areas recognized to contain cultural resources, such as Native American artifacts, would be avoided to the maximum extent feasible. However, even with the exception areas, it is not guaranteed that cultural resources would be entirely avoided. Nevertheless, given the reduced site disturbance, there would be reduced impacts to archaeological sites qualifying as historical resources or unique archaeological resources and reduced impacts to tribal cultural resources. All cultural resources mitigation measures identified for the proposed project would be applicable and required under Alternative 2, which would reduce, but not eliminate, significant and unavoidable impacts to archaeological sites that qualify as historical resources or unique archaeological resources and tribal cultural resources. Thus, impacts to archaeological resources and tribal cultural resources under Alternative 2 would be significant and unavoidable, although reduced in comparison to the proposed project.

As stated in Section 4.4, *Cultural Resources*, of this PEIR, all historic-period built environment resources, including utility infrastructure, within Areas I, III, and IV have been determined not eligible for listing in the NRHP or CRHR and, therefore, are not considered historical resources pursuant to CEQA Guidelines Section 15064.5. As such, any demolition, alteration, or removal of built environment resources in Areas I, III, and IV under Alternative 2 would not constitute a substantial adverse change in the significance of built environment resources that qualify as historical resources. Therefore, similar to the proposed project, Alternative 2 would result in no impact to built environment resources qualifying as historical resources and no mitigation measures would be required.

While maintaining paleontological resources is not a specific goal of the AOC exception, there is a possibility that impacts to unique paleontological resources would be reduced under this alternative compared to the proposed project, because there would be fewer areas of disturbance, and, therefore, less chance to impact potential subsurface resources. Similar to the proposed project, Alternative 2 would implement Mitigation Measure CUL-18, which requires the preparation of a Paleontological Resources Monitoring and Mitigation plan. Implementation of this measure would reduce some long-term and indirect impacts to unique paleontological resources or unique geological features by providing qualified professionals, sensitivity training, monitoring as outlined in the PRMMP, discovery and fossil recovery in the event resources are encountered, sediment sampling, and documentation and curation for any specimens salvaged during monitoring. Similar to the proposed project, with implementation of Mitigation Measure CUL-18, impacts to unique paleontological resources would be less than significant, although reduced in comparison to the less-than-significant impact identified for the proposed project.

Ground-disturbing activities associated with the cleanup activities could result in the inadvertent discovery of human remains. However, due to reduced excavation under this alternative, the possibility of discovering unknown human remains would be less than that of the proposed

project. Furthermore, similar to the proposed project, Alternative 2 would implement Mitigation Measures CUL-1 through CUL-6, and CUL 19, which would ensure protection and appropriate treatment of human remains, should they be discovered. With implementation of these measures, impacts to human remains would be less than significant under Alternative 2 and would be reduced in comparison to those identified for the proposed project.

Geology and Soils

Less excavation would occur under Alternative 2, therefore impacts to geology and soils would be reduced. Geologic and soil conditions described for the proposed project in Section 4.5, *Geology and Soils*, of this PEIR, would remain the same under this alternative and, as such, required mitigation measures for Alternative 2 would be the same as those prescribed for the proposed project. Similar to the proposed project, with implementation of mitigation, Alternative 2 would have less-than-significant impacts related to earthquake faults and seismic events, soil erosion or loss of topsoil, unstable geological units, and problematic soils. However, impacts identified for Alternative 2 would be reduced in comparison to those identified for the proposed project.

Greenhouse Gas Emissions

Similar to the proposed project, Alternative 2 would generate GHG emissions from implementation of cleanup activities due to use of onsite construction equipment, trucks, and worker vehicle trips. While the duration of cleanup activities and the amount of material being hauled to and from the project site would be reduced under this alternative, the maximum number of daily truck trips would be the same as the proposed project and, as such, would create a similar potentially significant impact. Similar to the proposed project, Alternative 2 would be required to implement GHG mitigation measures that reduce emissions below regulatory thresholds. With implementation of these mitigation measures, Alternative 2 would result in a less-than-significant impact with respect to GHG emissions, similar to the proposed project. Additionally, similar to the proposed project, Alternative 2 would not conflict with plans or policies for reducing GHG emissions and, as such, impacts would be less than significant.

Hazards and Hazardous Materials

Under Alternative 2, the AOC exceptions would reduce the areas to be excavated and, thus, the duration of cleanup activities and the amount of material being hauled to and from the project site would be reduced. As a result, the amount of hazardous materials being hauled offsite would be reduced. However, similar to the proposed project, Alternative 2 would result in a daily maximum of 96 truck trips. Furthermore, while the duration of cleanup activities and the amount of material being hauled to and from the project site would be reduced compared to the proposed project, this alternative would still transport and dispose a substantial amount of hazardous materials. Therefore, similar to the proposed project, it is anticipated that impacts with respect to transport, disposal, and use of hazardous materials under this alternative would be potentially significant. Mitigation Measures TRANS-1 (Traffic Management Plan), HAZ-2 (Hazardous Material Containment) and HAZ-5 (Transport of Radiological Material) prescribed for the proposed project related to the transport, disposal, and use of hazardous materials would be

applicable to Alternative 2. With implementation of these mitigation measures, impacts for Alternative 2 would be less than significant and reduced in comparison to the proposed project.

Similar to the proposed project, implementation of Alternative 2 would involve potential hazards caused by routine use of hazardous materials or reasonably foreseeable upset and accident conditions caused by spills involving the soil, demolition materials, and lead shot cleaned up and transported from the project site that contain chemicals and radionuclides above cleanup levels, and chemicals brought to and used at the site (fuels, lubricants, paint, and solvents, as well as the chemical agents used to treat soil or groundwater). While Alternative 2 would involve less excavation and hauling than the proposed project, the level of excavation and hauling would remain substantial and the potential hazards caused by routine use of hazardous materials or reasonably foreseeable upset and accident conditions would be significant. Although mitigation measures prescribed to the proposed project concerning the routine use of hazardous materials or reasonably foreseeable upset and accident conditions would be applicable to Alternative 2, impacts would remain significant and unavoidable. However, Alternative 2's impacts would be reduced in comparison to the significant and unavoidable impacts identified for the proposed project.

There are no schools or daycare centers within the project site, but similar to the proposed project, these uses exist along the transportation routes that would be used for Alternative 2. This alternative would incrementally reduce the risk for spills and other hazardous conditions near schools due to the reduced project duration and the reduced amount of material being hauled to and from the project site as compared to the proposed project. To reduce potential impacts, all mitigation measures prescribed to the proposed project concerning the transport of hazardous materials near a school would be applicable to Alternative 2. With implementation of these mitigation measures, impacts for Alternative 2 would be less than significant and reduced in comparison to the proposed project.

Similar to the proposed project, site cleanup under Alternative 2 would involve a substantial number of vehicles using local roadways and has the potential to interfere with emergency evacuation routes. As described above, the daily maximum number of truck trips and the hours of construction under Alternative 2 would be the same as projected for the proposed project. Thus, similar to the proposed project, Alternative 2 cleanup activities would have the same potential to worsen the existing LOS for one roadway segment that is part of the designated Secondary Disaster Route (i.e., Valley Circle Boulevard between Box Canyon Road and Woolsey Canyon Road). Similar to the proposed project, Alternative 2 would be required to implement Mitigation Measure TRANS-1, which would limit truck trips to off-peak traffic hours and would require preparation of a Traffic Management Plan. Implementation of this mitigation measure would ensure that Alternative 2 would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan and impacts would be less than significant. Given the reduced project duration and the reduced amount of material being hauled to and from the project site under Alternative 2, impacts are anticipated to be reduced in comparison to the proposed project.

The project site is located within a very high Fire Hazard Severity Zone. Similar to the proposed project, some of the treatment technologies that would be implemented under Alternative 2 to facilitate site cleanup, are classified as toxic, ignitable, corrosive, or reactive, which could ignite a wildfire. To reduce potential impacts, all mitigation measures prescribed for the proposed project concerning wildfire risk would be applicable to Alternative 2. With implementation of these mitigation measures, impacts to Alternative 2 would be less than significant and similar to the proposed project.

Similar to the proposed project, the use of chemical amendments under Alternative 2 would be necessary for certain soil and groundwater treatment technologies (e.g., bioventing, land farming, and in situ chemical oxidation, in situ enhanced biological treatment, and passive seep treatment) to facilitate cleanup. These chemical agents would be purposely placed into and left in the subsurface environment as a part of the treatment technology, but have the potential to create adverse effects if not managed appropriately. Because the potential treatment areas identified under Alternative 2 would be reduced as compared to the proposed project, Alternative 2 would result in a reduced amount of chemical amendments used to clean up the project site. All mitigation measures prescribed for the proposed project concerning the use of chemical amendments would be applicable to Alternative 2. Implementation of these mitigation measures would reduce impacts under Alternative 2 to less than significant and impacts would be reduced in comparison to the proposed project.

Hydrology and Water Quality

Similar to the proposed project, Alternative 2 has the potential to violate water quality standards or WDRs or otherwise substantially degrade water quality. However, because Alternative 2 would disturb less area, the potential for water quality impacts would be reduced compared to the proposed project. Alternative 2 cleanup activities would include substantial earthwork that requires the use of heavy equipment, which has the potential to result in erosion that could adversely impact receiving waters. The mitigation measures that were prescribed for the proposed project, such as the use of BMPs to control potential erosion, would also be applicable to Alternative 2. Implementation of these mitigation measures would reduce impacts on water quality standards and waste discharge requirements to less than significant for this alternative. Given the reduction in areas disturbed, impacts under Alternative 2 would be reduced in comparison to the proposed project.

Site cleanup activities for Alternative 2 would result in consumption of groundwater supplies, similar to the proposed project. Groundwater extraction and treatment under both Alternative 2 and the proposed project would be designed to extract groundwater at a rate that can be maintained for the duration of the remediation effort. Some of the treated groundwater could be returned to the underlying aquifer through an injection well or wells. Groundwater at the site is not currently used for water supply purposes and there are no anticipated future uses of underlying groundwater for water supply as part of this alternative. Eventually, upon completion of cleanup activities, the groundwater pumping would be terminated, which would allow the natural recharge to occur once the groundwater quality goals are met. Thus, similar to the proposed project, impacts on groundwater supplies would be less than significant and no

mitigation is required. The less-than-significant impacts under Alternative 2 would be reduced in comparison to the proposed project.

Alternative 2 cleanup activities would temporarily alter drainage patterns, although to a lesser extent than the proposed project due to the reduced area of land that would be disturbed. Upon completion of excavation, backfilling, and recontouring activities under Alternative 2, drainage patterns would be restored to natural conditions to the extent practicable. Mitigation Measure HYDRO-1, which is required for the proposed project, would be applicable and would require that the finished surfaces of the backfilled excavations do not create new areas of ponding that did not previously exist. There would be no alteration of a stream or other natural drainage feature with the exception of the removal of the earthen dams at the three existing pond locations to reestablish natural drainage patterns, which would be done in accordance with a Section 404 CWA permit, Section 401 WQC, and/or streambed alteration agreement as required by Mitigation Measure BIO-21. Similar to the proposed project, following backfilling activities, the areas would be reseeded with native seeds for long-term stability in accordance with Mitigation Measure BIO-5 under this alternative. In addition, Alternative 2 would be required to implement post-remediation monitoring as specified in DTSC-approved cleanup decision documents and O&M plan required by Mitigation Measure HYDRO-2, which would ensure that the final regrading of disturbed areas is stabilized and drainage patterns mimic preoperational conditions to the extent practicable. Similar to the proposed project, with implementation of these mitigation measures, Alternative 2 would have a less-than-significant impact related to the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite. Given the reduced area of land disturbance, erosion impacts would be reduced in comparison to the proposed project.

Similar to the proposed project, site cleanup under Alternative 2 would result in net decrease of impervious surfaces, a net increase in recharge, and would not create any substantive flooding. As described above, there would be no alteration of a stream or other natural drainage feature with the exception of the removal of the earthen dams at the three existing pond locations to reestablish natural drainage patterns, which would be done in accordance with a Section 404 CWA permit, Section 401 WQC, and/or streambed alteration agreement as required by Mitigation Measure BIO-21. Implementation of this mitigation measure under Alternative 2 would ensure that impacts related to the alteration of the course of a stream or river, or a substantial increase in the rate or amount of surface runoff in a manner that would result in flooding are reduced to less than significant. Given the reduced area of land disturbance, runoff and flooding impacts would be reduced in comparison to the proposed project.

Alternative 2 could create new sources of stormwater runoff, but to a lesser extent than the proposed project due to reduced land disturbance under Alternative 2. Similar to the proposed project, discharged water would be in accordance with NPDES permit requirements, which would include limitations on water quality and quantity. Alternative 2 would not increase the rate or volume of runoff to a level that could exceed the capacity of the existing or planned drainage system. Additionally, no other sources of polluted runoff would be created. Alternative 2 would follow the BMPs to eliminate or reduce the discharge of pollutants in stormwater and

construction-related non-stormwater discharges. This alternative has to potential to have less of an impact on stormwater drainage than the proposed project, because less area would be disturbed. The stormwater runoff mitigation measures identified for the proposed project would be applicable to Alternative 2. Similar to the proposed project, with implementation of mitigation measures, Alternative 2 would have a less-than-significant impact with respect to stormwater and site drainage and a reduced impact compared to the proposed project.

Land Use and Planning

Similar to the proposed project, site cleanup and initial activities under Alternative 2 would be inconsistent with Ventura County General Plan goals and policies. Alternative 2 activities would result in the removal of native vegetation and soils, which is inconsistent with the General Plan Biological Resources Goal 1.5.1 and Land Use - Open Space Policy 3.2.2.5(1). Compared to the proposed project, Alternative 2 would significantly reduce, but not eliminate, impacts to biological resources due to the reduction in land disturbed. Therefore, similar to the proposed project, Alternative 2 would be inconsistent with General Plan Biological Resources and Open Space goals and policies. All land use and planning mitigation measures prescribed for the proposed project would be applicable to Alternative 2. However, even with implementation of the mitigation measures, Alternative 2 would result in significant and unavoidable land use plan impacts given the inconsistency with the applicable Ventura County General Plan goals and policies, similar to the proposed project.

Noise

Under Alternative 2, noise generated on the project site during cleanup activities would impact the campground and ranger's house at Sage Ranch Park. The hours of cleanup operations would be the same as the proposed project; however, the duration of cleanup activities for Alternative 2 would be less than the proposed project. Similar to the proposed project, cleanup activities under Alternative 2 would not exceed the applicable noise standards established by the County of Los Angeles for construction-related noises at sensitive receptor sites in the county or city of Los Angeles. However, the cleanup activities would exceed the applicable noise standards established by the County of Ventura for noise-sensitive land uses at Sage Ranch Park. Mitigation Measure NOISE-1 would reduce impacts so that the applicable County of Ventura noise threshold would not be exceeded at sensitive receptors within Sage Ranch Park. Thus, similar to the proposed project, this impact would be reduced to a less-than-significant level with implementation of mitigation.

Similar to the proposed project, Alternative 2 cleanup activities would have the potential to generate low levels of ground-borne vibration from the operation of heavy off-road equipment. However, cleanup activities associated with this alternative would not exceed the vibration thresholds set by the County of Los Angeles and the Federal Transit Administration, which is recommended in the Ventura County Initial Study Assessment Guidelines. Furthermore, vibration-related impacts under Alternative 2 would be shorter in duration than the proposed project. Therefore, vibration-related impacts associated with building damage and human annoyance would be less than significant and reduced in comparison to the proposed project.

Similar to the proposed project, Alternative 2 site cleanup and traffic noise would increase ambient noise levels in the vicinity of the project site, particularly at the campground and ranger's house at Sage Ranch Park and along the roadways being used as a truck route. While cleanup activities would be reduced under Alternative 2, the daily maximum number of truck trips (96 trips per day) would remain the same as the proposed project. Thus, any increase in noise levels under Alternative 2 would be similar to the proposed project, although shorter in duration.

Like the proposed project, during the cleanup the ranger's house and campsites at Sage Ranch Park would experience a 5.5 dBA increase, which exceeds the County of Ventura's threshold. Mitigation Measures NOISE-1 and NOISE-2 would be required to reduce ambient noise at campground and ranger's house during nighttime and daytime cleanup activities, respectively. Implementation of these mitigation measures would reduce any increase in ambient noise levels to less than significant. As noted above, Alternative 2 would be shorter in duration than the proposed project and, thus, impacts would be reduced in comparison to the less-than-significant impacts identified for the proposed project. Similar to the proposed project, given the 2,000-foot distance from the nearest sensitive receptor (campground and ranger's house), Alternative 2 would not increase noise levels to the extent that it would exceed the County of Ventura's threshold for initial activities. Thus, this impact would be less than significant and similar to the proposed project.

Given that the number of truck trips and worker vehicle trips would not change under Alternative 2, noise impacts related to traffic noise levels would generally be the same as the proposed project, although shorter in duration. Thus, similar to the proposed project, Alternative 2 construction truck and worker vehicle trips would increase the peak-hour noise levels on Facility Road at Woolsey Canyon Road and Woolsey Canyon Road, between Valley Circle Boulevard and Knapp Ranch Road, by 5.0 and 7.8 dBA L_{eq}, respectively. While implementation of Mitigation Measure NOISE-3 would require construction of noise barriers along Facility Road and Woolsey Canyon Road, it may not be feasible, practical, or acceptable to construct a noise barrier for the duration of the project, due to objection by property owners and other constraints. Thus, Alternative 2 would result in traffic noise impacts that would be considered significant and unavoidable. Given the reduction in duration, impacts would be reduced in comparison to the proposed project.

Transportation and Traffic

Given the AOC exception areas, under Alternative 2 the duration of cleanup activities and the amount of material being hauled to and from the project site would be reduced compared to the proposed project. However, the maximum number of daily truck trips (96 round trips) would remain the same as the proposed project and, thus, impacts to transportation and traffic are expected to be similar, although shorter in duration. Like the proposed project, implementation of this alternative would significantly contribute to the future degradation of traffic LOS at area intersections and on area roadways, and thus a potentially significant impact would occur. Mitigation Measure TRANS-1 would reduce direct or indirect impacts; however, it would not prevent them from occurring. Therefore, even with implementation of mitigation measures, impacts would be significant and unavoidable. Given that impacts would not be reduced,

Alternative 2 would conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, similar to the proposed project.

Similar to the proposed project, Alternative 2 would not result in any hazards due to design features, but truck trips generated by remediation activities would introduce incompatible uses (i.e., large vehicles) to a road network that is currently predominantly used by passenger cars. This would cause a potentially significant impact to pedestrian and/or bicycle safety. In addition, implementation of this alternative would substantially increase hazards due to potential safety conflicts between trucks and pedestrians at the intersection of Roscoe Boulevard and Hillary Drive, between trucks and bicyclists on Valley Circle Boulevard, and increased wear and tear on road conditions, similar to the proposed project. Implementation of Mitigation Measure TRANS-1 would reduce the potential conflicts between trucks and pedestrian and bicycle traffic and implementation of Mitigation Measure TRANS-2 would reduce impacts related to roadway damage. Implementation of these mitigation measures would ensure that traffic-related impacts due to hazardous design features or incompatible uses are reduced under Alternative 2, similar to the proposed project.

Similar to the proposed project, cleanup activities under Alternative 2 would involve a substantial number of vehicles using local roadways and has the potential to interfere with emergency evacuation routes. As described above, the daily maximum number of trucks trips and the hours of construction under Alternative 2 would be the same as projected for the proposed project. Thus, similar to the proposed project, Alternative 2 cleanup activities would have the same potential to worsen the existing LOS for one roadway segment that is part of the designated Secondary Disaster Route (i.e., Valley Circle Boulevard between Box Canyon Road and Woolsey Canyon Road). Similar to the proposed project, Alternative 2 would be required to implement Mitigation Measure TRANS-1, which would limit truck trips to off-peak traffic hours and would require preparation of a Traffic Management Plan. Implementation of this mitigation measure would ensure that Alternative 2 would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan and impacts would be less than significant. Given the reduced project duration and the reduced amount of material being hauled to and from the project site under Alternative 2, impacts would be reduced in comparison to the proposed project.

Utilities and Services Systems

Alternative 2 would generate less waste than the proposed project, because less soil would be removed and disposed of at offsite landfills. Similar to the proposed project, the facilities identified for disposal of waste generated from Alternative 2 cleanup activities would have sufficient permitted capacity. Therefore, similar to the proposed project, impacts related to landfill capacity would be less than significant and no mitigation would be required. In addition, the Alternative 2 waste stream would not exceed the available permitted capacity and permitted daily throughput of relevant landfills, which means that Alternative 2 would comply with federal, state, and local statutes related to solid waste disposal. Similar to the proposed project, this impact would be less than significant and no mitigation would be required. Furthermore, given the

reduction in solid waste generated under Alternative 2, impacts would be reduced compared to the proposed project.

Energy Conservation

Under Alternative 2, the duration of cleanup activities and the amount of material being hauled to and from the project site would be reduced compared to the proposed project. Thus, the total amount of petroleum fuels that would be consumed under Alternative 2 would be reduced. Because Alternative 2 would result in less soil excavation and total truck trips, this alternative would have the potential to reduce the use of electricity consuming cleanup technologies such as SVE/air sparging, bioventing, gaseous electron donor injection, and thermal desorption. The mitigation measures to reduce energy consumption for the proposed project would be applicable to Alternative 2. With implementation of these mitigation measures, Alternative 2 energy-related impacts would be reduced to less than significant and impacts would be reduced in comparison to the proposed project.

Relationship of the Alternative to Project Objectives

Alternative 2 would meet all of the project objectives, including cleaning up soil and groundwater contaminants in compliance with applicable regulatory standards and the protection of human health and the environment. Although, under Alternative 2 excavation areas would be reduced, it would meet the project objective regarding the reduction of the toxicity, mobility, or volume of contaminated media and preventing or minimizing the migration of contaminants media to offsite areas. Alternative 2 would also meet the objective to remediate the site in an expedient and cost-effective manner. This alternative would also use in situ cleanup methods, to the extent practicable, to minimize physical impacts to the environment and would remediate the site in an expedient and cost-effective manner. Alternative 2 would meet the objective of recognizing the unique biological and cultural significance of the project site by ensuring that the AOC exception sites are left undisturbed. This alternative would be compatible with Ventura County's designation of the property. However, as stated in Section 2.1.1, *Combined Program- and Project- Level Analysis*, of this PEIR, the remediation methods and technologies and corrective actions proposed are based on available investigation and characterization documents that have been prepared to date. After completion of the investigation and characterization documents and treatability studies, DTSC will select and approve the cleanup decision document for implementation. Once the cleanup decision documents have been approved, DTSC, along with the appropriate resource agencies, will determine where and if the AOC exceptions can be applied.

6.3.2.3 Alternative 3: Reduced Truck Trip Scenario

This alternative would limit the maximum number of daily truck trips associated with the project to 48 round trips per day, which is half of the daily maximum defined for the proposed project (i.e., 96 round trips per day). Limiting the maximum number of daily truck trips under this alternative would extend the schedule by 6 years. All other components would remain the same as under the proposed project.

Environmental Impacts

Aesthetics

Alternative 3 would result in the same area and amount of site disturbance as the proposed project, but would extend the cleanup schedule by up to 6 years (for a total of approximately 21 years). Similar to the proposed project, Sage Ranch Loop Trail would be considered a scenic vista under this alternative because it is a focal point for recreational visitors and is within close proximity to Area I. Given that cleanup activities would occur in Area I, which is within close proximity to a scenic vista, it is anticipated that impacts would be similar to the proposed project and that the same mitigation measures would be implemented. Implementation of these mitigation measures would ensure that impacts are reduced to less than significant for this alternative. However, because the cleanup schedule would be extended by 6 years under Alternative 3, impacts to a scenic vista would be slightly greater (in duration) than those identified for the proposed project.

As described above, the project site is not located within the vicinity of a designated state scenic highway and, therefore, would not damage scenic resources, such as a tree, rock outcropping, or historic buildings, within a designated state scenic highway. However, the nearby SR 118, approximately, 2.5 miles north of the project site, is an Eligible State Scenic Highway. Given that motorist views from SR 118 are typically brief in duration and are often completely screened by intervening topography and vegetation, it is not anticipated that cleanup activities under Alternative 3 would result in substantial damage to scenic resources within a designated state scenic highway. Therefore, this impact would be less than significant. However, given the extended cleanup schedule, it is likely that impacts would be greater than the proposed project.

Similar to the proposed project, visual impacts associated with Alternative 3 would include the presence of staging and operation of remediation equipment and generation of dust. In addition, this alternative would require earth moving activities such as grading and may also require the removal or relocation of boulders and rock outcroppings, which could result in visual impacts to the visual character. Similar to the proposed project, to reduce potential impacts for Alternative 3, including staging equipment, generation of dust, and removal or relocation of scenic resources, Mitigation Measures AQ-2, AQ-3, AQ-5, and BIO-5 would be implemented. While impacts to the visual quality and character would be reduced with implementation of these mitigation measures, due to the extended cleanup schedule, they would be slightly greater than the proposed project.

Similar to the proposed project, Alternative 3 would not create a new source of substantial light or glare in the project vicinity or increase backscatter of light into the nighttime sky. Construction activities and daily hours would be similar to the proposed project and would be limited to mostly daytime hours. Under this alternative, nighttime security lighting at construction laydown areas may be necessary; however, with the exception of recreationists within Sage Ranch Park, which is only accessible during daylight hours, the project site is generally not visible to the public. Given that this alternative would extend the cleanup schedule by 6 years, it would extend light impacts as compared to the proposed project. Thus, while this impact would be less than significant, it would be greater than with the proposed project.

Air Quality

Alternative 3 would result in the same area and amount of site disturbance as the proposed project, but the cleanup schedule would be extended by 6 years. However, air pollutant emissions thresholds are quantified by VCAPCD and SCAQMD in pounds per day. Thus, air quality impacts are evaluated based on daily maximum emissions. While Alternative 3 has the potential to reduce truck trip emissions by approximately half the amount estimated for the proposed project, it would not reduce the onsite equipment usage emissions and, thus, emissions would still exceed VCAPCD and SCAQMD emissions thresholds. Even with the implementation of Mitigation Measures AQ-1 through AQ-5, BIO-5, GHG-1 through GHG-3, and HAZ-2, emissions for this alternative would not be reduced to below VCAPCD's thresholds with the VCAPCD AQMP's goal of reducing regional pollutant emissions consistent with the SIP. With mitigation, Alternative 3's NOx emissions would be below applicable SCAQMD regional thresholds and, thus, would not conflict with SCAQMD's AQMP. However, because this alternative would be in conflict with the VCAPCD's AQMP, this impact would be significant and unavoidable, although less than the significant and unavoidable impacts identified for the proposed project.

Similar to the proposed project, Alternative 3 would generate onsite and offsite construction emissions that have the potential to expose nearby sensitive receptors to substantial pollutant concentrations of CO, NOx, PM_{10}, $PM_{2.5}$, and toxic air contaminants. However, Alternative 3 would not expose sensitive receptors to substantial pollutant concentrations, even with the extended cleanup schedule. Therefore, implementation of this alternative would not result in significant CO or impacts with respect to localized NOx, CO, PM_{10}, and $PM_{2.5}$. Given the extended cleanup schedule, impacts would be slightly greater than the less-than-significant impact identified for the proposed project.

Similar to the proposed project, Alternative 3 would have a significant and unavoidable cumulative impact with respect to air quality, because Alternative 3 would be inconsistent with the applicable air quality management plans. Although the same mitigation prescribed for the proposed project would also be applicable to Alternative 3, cumulative air quality impacts would remain significant and unavoidable after incorporation of mitigation, similar to the proposed project.

While objectionable odors would be produced during remediation activities for Alternative 3, they would be temporary and dissipate with distance. Thus, the objectionable odors generated under this alternative would not have the potential to affect the nearby sensitive receptors to the north, east, and south. Furthermore, while not mandatory to reduce impacts, Mitigation Measure HAZ-2 would be implemented to reduce the potential for odors. Therefore, impacts related to odors from remediation activities under Alternative 3 would be less than significant. Given the extended duration of construction under this alternative, impacts would be greater than the less-than-significant impacts identified for the proposed project.

Biological Resources

Impacts to biological resources would be the same under Alternative 3, as the proposed areas of disturbance would be the same as for the proposed project. Therefore, Alternative 3 would have similar impacts to Braunton's milk-vetch and other special-status species as the proposed project. Similar to the proposed project, Alternative 3 would be required to implement the same mitigation measures as those required for the proposed project (BIO-1 through BIO-23). However, even with implementation of these mitigation measures, impacts to Braunton's milk-vetch and special-status species would be significant and unavoidable. Given the extended schedule, impacts would be slightly greater than the significant and unavoidable impact identified for the proposed project.

Under Alternative 3, soil remediation activities would take place within various aquatic/riparian habitats, as well as sensitive upland habitats, including chaparral, coast live oak woodland, Southern California walnut woodland, Venturan coastal sage scrub, steep dipslope grassland, and vegetated rock outcrops, similar to the proposed project. To reduce the potential to impact sensitive natural communities, similar to the proposed project, mitigation measures would be implemented, which would require restoration and/or suitable compensatory mitigation of impacted sensitive natural communities. Implementation of these mitigation measures would reduce impacts to less than significant and impacts would be greater than with the proposed project.

Site disturbance under Alternative 3 would be similar to the proposed project and, thus, impacts to potential jurisdictional resources resulting from soil remediation would be similar. Therefore, similar to the proposed project, Alternative 3 would be required to implement Mitigation Measures BIO-4 and BIO-21. With implementation of these mitigation measures, this alternative would not have a substantial adverse effect on federally or state protected wetlands and waters. Thus, potential impacts under Alternative 2 would be less than significant, although greater than with the proposed project because of the extended schedule.

As described in Section 4.3, *Biological Resources*, of this PEIR, the eastern strand of the Santa Monica-Sierra Madre Landscape Linkage, a wildlife migration corridor, runs through Area I of the project site. Under Alternative 3, cleanup activities would occur in the same area as the proposed project. Thus, there would be a potential impact. To reduce impacts, mitigation measures identified for the proposed project (BIO-12, BIO-16, and BIO-22) would be implemented for Alternative 3. Implementation of these mitigation measures would not interfere with the movement of any native resident or migratory fish or wildlife species, migratory wildlife corridors, or impede the use of native wildlife nursery sites. Therefore, potential impacts under Alternative 3 would be less than significant, although greater than with the proposed project.

Similar to the proposed project, Alternative 3 would conflict with local goals, objectives and policies that include the Ventura County Tree Protection Ordinance, Ventura County Oak Woodlands Management Plan, and the Ventura County General Plan. Implementation of Mitigation Measures BIO-1 through BIO-23 would minimize impacts to sensitive biological resources that would occur as a result of proposed remediation activities. Therefore, Alternative 3

would not conflict with any local policies or ordinances protecting biological resources and impacts would be less than significant, similar to the proposed project.

The project site is not located within an adopted or approved habitat conservation plan or natural community conservation plan. Therefore, Alternative 3 would not conflict with the provisions of an adopted or approved habitat conservation or natural community conservation plan and there would be no impact, similar to the proposed project.

Cultural Resources

Under Alternative 3, proposed areas of disturbance would be the same as the proposed project. Thus, Alternative 3 would result in similar impacts to cultural resources as the proposed project. Impacts to archaeological sites qualifying as historical or unique archaeological resources and on tribal cultural resources would be potentially significant. As such, all cultural resources mitigation measures identified for the proposed project would be applicable and required under Alternative 3. However, even with implementation of mitigation measures, impacts to archaeological sites that qualify as historical resources or unique archaeological resources and tribal cultural resources would be significant and unavoidable, similar to the proposed project.

As stated in Section 4.4, *Cultural Resources*, of this PEIR, all historic-period built environment resources, including utility infrastructure, within Areas I, III, and IV have been determined not eligible for listing in the NRHP or CRHR and, therefore, are not considered historical resources pursuant to CEQA Guidelines Section 15064.5. As such, any demolition, alteration, or removal of built environment resources in Areas I, III, and IV under Alternative 3 would not constitute a substantial adverse change in the significance of built environment resources that qualify as historical resources. Therefore, similar to the proposed project, Alternative 3 would result in no impact to built environment resources qualifying as historical resources and no mitigation measures would be required.

Under Alternative 3, excavation has the potential to impact a unique paleontological resource or site or unique geologic feature. Similar to the proposed project, Alternative 3 would implement Mitigation Measure CUL-18. Implementation of this measure would reduce some long-term and indirect impacts to unique paleontological resources or unique geological features by providing qualified professionals, sensitivity training, monitoring as outlined in the mitigation measure, discovery and fossil recovery in the event resources are encountered, sediment sampling, and documentation and curation for any specimens salvaged during monitoring. Similar to the proposed project, with implementation of Mitigation Measure CUL-18, impacts to unique paleontological resources would be less than significant.

Ground-disturbing activities associated with the cleanup activities could result in the inadvertent discovery of human remains. Similar to the proposed project, Alternative 3 would implement Mitigation Measures CUL-1 through CUL-6, and CUL 19, which would ensure protection and appropriate treatment of human remains, should they be discovered. With implementation of these measures, under Alternative 3 impacts to human remains would be less than significant, similar to the proposed project.

Geology and Soils

Under Alternative 3, the proposed areas of disturbance would be the same as with the proposed project; thus, the quantity of soil requiring remediation would remain unchanged. Geologic and soil conditions described for the proposed project in Section 4.5, *Geology and Soils*, of this PEIR, would remain the same under this alternative and, as such, required mitigation measures for Alternative 3 would be the same as those prescribed for the proposed project. Similar to the proposed project, with implementation of mitigation, Alternative 3 would have less-than-significant impacts related to earthquake faults and seismic events, soil erosion or loss of topsoil, unstable geological units, and problematic soils. However, impacts identified for Alternative 3 would be slightly greater than with the proposed project, due to the extended schedule.

Greenhouse Gas Emissions

Similar to the proposed project, Alternative 3 would generate GHG emissions from implementation of cleanup activities due to use of onsite construction equipment, trucks, and worker vehicle trips. However, the maximum number of daily truck trips would be reduced in half under Alternative 3 (48 round trips per day) compared to the proposed project (96 round trips per day). Even with this reduction, Alternative 3 would be required to implement GHG mitigation measures that reduce emissions below regulatory thresholds. With implementation of these mitigation measures, Alternative 3 would result in a less-than-significant impact with respect to GHG emissions, although reduced in comparison to the proposed project. Additionally, similar to the proposed project, Alternative 3 would not conflict with plans or policies for reducing GHG emissions and, as such, impacts would be less than significant.

Hazards and Hazardous Materials

Under Alternative 3, proposed areas of disturbance would be the same as the proposed project; however, the maximum number of daily truck trips would be 48 round trips per day, which would be half of the daily maximum defined for the proposed project (i.e., 96 round trips per day). Although there would be fewer maximum daily truck trips under this alternative, truck hauling activities would extend 6 years beyond the 15-year cleanup schedule and would result in the same total material transport as the proposed project. As a result, maximum daily diesel particulate matter emissions would be reduced compared to the proposed project, but would occur over a longer-term duration. Thus, early year childhood exposure to diesel particulate matter emissions would be less than the proposed project, but young adult and adult exposure would be greater than the project. Based on the revised May 2015 health risk assessment guidelines from the Office of Environmental Health Hazard Assessment (OEHHA), health risks during early year childhood exposure are greater than health risks during young adult and adult exposure. It is anticipated that health impacts with respect to transport, disposal, and use of hazardous materials could be similar to or slightly less than the proposed project, and remain less than significant with implementation of Mitigation Measures TRANS-1, HAZ-2, and HAZ-5 under Alternative 3.

Similar to the proposed project, implementation of Alternative 3 would involve potential hazards caused by routine use of hazardous materials or reasonably foreseeable upset and accident conditions caused by spills involving the soil, demolition materials, and lead shot cleaned up and transported from the project site that contain chemicals and radionuclides above cleanup levels,

and chemicals brought to and used at the site (fuels, lubricants, paint, and solvents, as well as the chemical agents used to treat soil or groundwater). Although there would be fewer maximum daily truck trips under this alternative, truck hauling activities would extend well beyond the 15-year cleanup schedule and would result in the same total material transport as the proposed project. Although mitigation measures prescribed to the proposed project concerning the routine use of hazardous materials or reasonably foreseeable upset and accident conditions would be applicable to Alternative 3, impacts would remain significant and unavoidable, similar to the proposed project.

There are no schools or daycare centers within the project site, but similar to the proposed project, these uses exist along the transportation routes that would be used for Alternative 3. Compared to the proposed project, this alternative would incrementally increase the risk for spills and other hazardous conditions near schools due to the lengthened project duration; however, this would be offset due to the reduced amount of trucks traveling to and from the project site on a daily basis. To reduce potential impacts, all mitigation measures prescribed to the proposed project concerning the transport of hazardous materials near a school would be applicable to Alternative 3. With implementation of these mitigation measures, impacts for Alternative 3 would be less than significant, similar to the proposed project.

Similar to the proposed project, site cleanup under Alternative 3 would involve a substantial number of vehicles using local roadways and has the potential to interfere with emergency evacuation routes. As described above, the daily maximum number of trucks trips and the hours of construction under Alternative 3 would be the same as for the proposed project. Thus, similar to the proposed project, Alternative 3 cleanup activities would have the same potential to worsen the existing LOS for one roadway segment that is part of the designated Secondary Disaster Route (i.e., Valley Circle Boulevard between Box Canyon Road and Woolsey Canyon Road). Similar to the proposed project, Alternative 3 would be required to implement Mitigation Measure TRANS-1, which would limit truck trips to off-peak traffic hours and would require preparation of a Traffic Management Plan. Implementation of this mitigation measure would ensure that Alternative 3 would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan and impacts would be less than significant, similar to the proposed project.

The project site is located within a very high Fire Hazard Severity Zone. Similar to the proposed project, some of the treatment technologies that would be implemented under Alternative 3 to facilitate site cleanup, are classified as toxic, ignitable, corrosive, or reactive, which could ignite a wildfire. To reduce potential impacts, all mitigation measures prescribed for the proposed project concerning wildfire risk would be applicable to Alternative 3. With implementation of these mitigation measures, impacts to Alternative 3 would be less than significant, similar to the proposed project.

The use of chemical amendments under Alternative 3 would be necessary for certain soil and groundwater treatment technologies to facilitate cleanup, similar to the proposed project. These chemical agents would be purposely placed into and left in the subsurface environment as a part of the treatment technology, but have the potential to create adverse effects if not managed appropriately. To reduce impacts, all mitigation measures prescribed for the proposed project concerning the use of chemical amendments would be applicable to Alternative 3. Implementation of these mitigation measures would reduce impacts under Alternative 3 to less than significant, similar to the proposed project.

Hydrology and Water Quality

Similar to the proposed project, Alternative 3 has the potential to violate water quality standards or WDRs or otherwise substantially degrade water quality. Alternative 3 remediation activities would include substantial earthwork that requires the use of heavy equipment, which has the potential to result in erosion that could adversely impact receiving waters. The mitigation measures that were prescribed for the proposed project, such as the use of BMPs to control potential erosion, would also be applicable to Alternative 3. Implementation of these mitigation measures would reduce impacts on water quality standards and waste discharge requirements to less than significant for this alternative, similar to the proposed project.

Site cleanup activities for Alternative 3 would result in consumption of groundwater supplies, similar to the proposed project. Groundwater extraction and treatment under both Alternative 3 and the proposed project would be designed to extract groundwater at a rate that can be maintained for the duration of the remediation effort. Some of the treated groundwater could be returned to the underlying aquifer through an injection well or wells. Groundwater at the site is not currently used for water supply purposes and there are no anticipated future uses of underlying groundwater for water supply as part of this alternative. Eventually, upon completion of cleanup activities, the groundwater pumping would be terminated, which would allow the natural recharge to occur once the groundwater quality goals are met. Thus, similar to the proposed project, impacts on groundwater supplies would be less than significant and no mitigation is required.

Alternative 3 cleanup activities would temporarily alter drainage patterns, similar to the proposed project. Upon completion of excavation, backfilling, and recontouring activities under Alternative 3, drainage patterns would be restored to natural conditions to the extent practicable. Similar to the proposed project, implementation of Mitigation Measure HYDRO-1 would ensure that the finished surfaces of the backfilled excavations do not create new areas of ponding that did not previously exist. There would be no alteration of a stream or other natural drainage feature with the exception of the removal of the earthen dams at the three existing pond locations to reestablish natural drainage patterns, which would be done in accordance with regulatory standards required in Mitigation Measure BIO-21. Similar to the proposed project, Alternative 3 would be required to implement Mitigation Measure BIO-5, which requires the areas would be reseeded with native seeds for long-term stability after backfilling activities. In addition, Alternative 3 would be required to implement post-remediation monitoring as specified in DTSC-approved cleanup decision documents and O&M plan required by Mitigation Measure

HYDRO-2, which would ensure that the final regrading of disturbed areas is stabilized and drainage patterns mimic preoperational conditions to the extent practicable. With implementation of these mitigation measures, Alternative 3 would have a less-than-significant impact related to the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite, similar to the proposed project.

Site cleanup under Alternative 3 would result in net decrease of impervious surfaces, a net increase in recharge, and would not create any substantive flooding, similar to the proposed project. As described above, there would be no alteration of a stream or other natural drainage feature with the exception of the removal of the earthen dams at the three existing pond locations to reestablish natural drainage patterns, which would be done in accordance with regulatory standards required by Mitigation Measure BIO-21. Implementation of this mitigation measure under Alternative 3 would ensure that impacts related to the alteration of the course of a stream or river, or a substantial increase in the rate or amount of surface runoff in a manner that would result in flooding are reduced to less than significant, similar to the proposed project.

Alternative 3 could create new sources of stormwater runoff, similar to the proposed project. To avoid impacts, discharged water would be in accordance with NPDES permit requirements, which would include limitations on water quality and quantity. Alternative 3 would not increase the rate or volume of runoff to a level that could exceed the capacity of the existing or planned drainage system. Additionally, no other sources of polluted runoff would be created. Alternative 3 would follow the BMPs to eliminate or reduce the discharge of pollutants in stormwater and construction-related non-stormwater discharges. The stormwater runoff mitigation measures identified for the proposed project would be applicable to Alternative 3. With implementation of mitigation measures, Alternative 3 would have a less-than-significant impact with respect to stormwater and site drainage, similar to the proposed project.

Land Use and Planning

Similar to the proposed project, Alternative 3 would be inconsistent with the applicable Ventura County General Plan goals and policies. Alternative 3 activities would result in the removal of native vegetation and soils, which is inconsistent with the General Plan Biological Resources Goal 1.5.1 and Land Use - Open Space Policy 3.2.2.5(1). Compared to the proposed project, Alternative 3 would not reduce impacts to biological resources; therefore, similar to the proposed project, Alternative 3 would be inconsistent with General Plan Biological Resources and Open Space goals and policies. All land use and planning mitigation measures prescribed for the proposed project would be applicable to Alternative 3. However, even with implementation of the mitigation measures, Alternative 3 would result in significant and unavoidable land use plan impacts given the inconsistency with the applicable Ventura County General Plan goals and policies, similar to the proposed project.

Noise

Under Alternative 3, noise generated on the project site during cleanup activities would impact the campground and ranger's house at Sage Ranch Park. The hours of cleanup operations would be the same as the proposed project; however, the duration of cleanup activities for Alternative 3 would be extended compared to the proposed project. Similar to the proposed project, cleanup activities under Alternative 3 would not exceed the applicable noise standards established by the County of Los Angeles for construction-related noises at sensitive receptor sites in the county or city of Los Angeles. However, the cleanup activities would exceed the applicable noise standards established by the County of Ventura for noise-sensitive land uses at Sage Ranch Park. Mitigation Measure NOISE-1 would reduce impacts so that the applicable County of Ventura noise threshold would not be exceeded at sensitive receptors within Sage Ranch Park. Thus, this impact would be reduced to a less-than-significant level with implementation of mitigation, similar to the proposed project.

Alternative 3 would have the potential to generate low levels of ground-borne vibration from the operation of heavy off-road equipment, similar to the proposed project. However, cleanup activities associated with this alternative would not exceed the vibration thresholds set by the County of Los Angeles and the Federal Transit Administration, which is recommended in the Ventura County Initial Study Assessment Guidelines. Therefore, vibration-related impacts associated with building damage and human annoyance would be less than significant, although greater in comparison to impacts with the proposed project, given the extended schedule.

Similar to the proposed project, traffic noise associated with Alternative 3 would temporarily and permanently increase ambient noise levels in the vicinity of the project site, particularly at the campground and ranger's house at Sage Ranch Park and along the roadways being used as a haul route. While duration of cleanup activities would increase under Alternative 3, the daily maximum number of truck trips (48 trips per day) would be reduced compared to the proposed project.

Like the proposed project, during the site cleanup under Alternative 3, the ranger's house and campsites at Sage Ranch Park would experience a 5.5 dBA increase under Alternative 3, which exceeds the County of Ventura's threshold. Mitigation Measures NOISE-1 and NOISE-2 would be required to reduce ambient noise at campground and ranger's house during nighttime and daytime cleanup activities, respectively. Implementation of these mitigation measures would reduce any increase in ambient noise levels to less than significant. Furthermore, similar to the proposed project, given the 2,000-foot distance from the nearest sensitive receptor (campground and ranger's house), Alternative 3 would not increase noise levels to the extent that it would exceed the County of Ventura's threshold for initial activities. Thus, this impact would be less than significant and similar to the proposed project.

The number of truck trips would significantly be reduced under Alternative 3, and, thus, noise impacts related to traffic noise levels would generally be reduced compared to the proposed project, although not below a level of significance, and they would occur for a longer duration. Thus, similar to the proposed project, Alternative 3 truck and worker vehicle trips would increase

the peak-hour noise levels on Facility Road at Woolsey Canyon Road and Woolsey Canyon Road, between Valley Circle Boulevard and Knapp Ranch Road, by 3.8 and 5.4 dBA L_{eq}, respectively (ESA, 2017d, see Appendix I). While implementation of Mitigation Measure NOISE-3 would require construction of noise barriers along Facility Road and Woolsey Canyon Road, it may not be feasible, practical, or acceptable to construct a noise barrier for the duration of the project, due to objection by property owners and other constraints. Thus, Alternative 3 would result in traffic noise impacts that would be considered significant and unavoidable. Given the reduction in duration, impacts would be reduced in comparison to the proposed project.

Transportation and Traffic

Under Alternative 3, the maximum number of daily truck trips (48 round trips) would be reduced compared to the proposed project and, thus, impacts to transportation and traffic would be reduced, although longer in duration. Like the proposed project, implementation of this alternative would significantly contribute to the future degradation of traffic LOS at area intersections and on area roadways. Mitigation Measure TRANS-1 would reduce direct or indirect impacts; however, it would not prevent impacts from occurring. Therefore, even with implementation of mitigation measures, impacts would be significant and unavoidable. Given that impacts would not be reduced, Alternative 3 would conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, similar to the proposed project.

Similar to the proposed project, Alternative 3 would not result in any hazards due to design features, but truck trips generated by remediation activities would introduce incompatible uses (i.e., large vehicles) to a road network that is currently predominantly used by passenger cars. This would cause a potentially significant impact to pedestrian and/or bicycle safety. Implementation of this alternative would substantially increase hazards due to potential safety conflicts between trucks and pedestrians at the intersection of Roscoe Boulevard and Hillary Drive, between trucks and bicyclists on Valley Circle Boulevard, and increased wear and tear on road conditions. Mitigation Measure TRANS-1 would reduce the potential conflicts between trucks and pedestrian and bicycle traffic and implementation of Mitigation Measure TRANS-2 would reduce impacts related to roadway damage. Implementation of these mitigation measures would ensure that traffic-related impacts due to hazardous design features or incompatible uses are reduced under Alternative 3, similar to the proposed project.

Similar to the proposed project, Alternative 3 would involve a substantial number of vehicles using local roadways and has the potential to interfere with emergency evacuation routes. As described above, the daily maximum number of trucks trips and the hours of construction under Alternative 3 would be the same as projected for the proposed project. Thus, similar to the proposed project, Alternative 3 cleanup activities would have the same potential to worsen the existing LOS for one roadway segment that is part of the designated Secondary Disaster Route (i.e., Valley Circle Boulevard between Box Canyon Road and Woolsey Canyon Road). Similar to the proposed project, Alternative 3 would be required to implement Mitigation Measure TRANS-1, which would limit truck trips to off-peak traffic hours and would require preparation of a Traffic Management Plan. Implementation of this mitigation measure would ensure that

Alternative 3 would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan and impacts would be less than significant. Given the reduced project duration and the reduced amount of material being hauled to and from the project site under Alternative 3, impacts are anticipated to be reduced in comparison to the proposed project.

Utilities and Services Systems

Similar to the proposed project, the facilities identified for disposal of waste generated from Alternative 3 would have sufficient permitted capacity. Therefore, similar to the proposed project, impacts related to landfill capacity would be less than significant and no mitigation would be required. In addition, the Alternative 3 waste stream would not exceed the available permitted capacity and permitted daily throughput of relevant landfills, which means that Alternative 3 would comply with federal, state, and local statutes related to solid waste disposal. Similar to the proposed project, this impact would be less than significant and no mitigation would be required.

Energy Conservation

While the maximum number of daily truck trips would be capped at 48 round trips per day, the total energy demand would be the same as the proposed project over the duration of cleanup activities. However, more employee vehicle trips would be required because the excavation schedule would be extended compared to the proposed project. This increase in employee vehicle trips has the potential to incrementally increase gasoline consumption when compared to the proposed project. However, this increase in gasoline consumption would be nominal compared to fuel consumption under this alternative. Thus, fuel consumption under this alternative would be similar to that of the proposed project. Mitigation measures included for the proposed project would be applicable to Alternative 3. Similar to the proposed project, Alternative 3 would result in less-than-significant impacts with mitigation incorporated with respect to energy conservation.

Relationship of the Alternative to Project Objectives

Alternative 3 would meet most of the project objectives, including cleanup of soil and groundwater contaminants in compliance with applicable regulatory standards and the protection of human health and the environment. Cleanup activities under Alternative 3 would reduce the toxicity, mobility, or volume of contaminated media and prevent or minimize the migration of contaminants to offsite areas. This alternative would also use in situ cleanup methods, to the extent practicable, to minimize physical impacts to the environment. Compared to the proposed project, Alternative 3 would also comply with the objective of recognizing the unique biological and cultural significance of the project site through protection of resources to the extent practicable and consistent with applicable laws and regulations for such resources. This alternative would be compatible with Ventura County's designation of the property. This alternative would not meet the objective to remediate the site in an expedient and cost-effective manner because it would extend the cleanup schedule 6 years beyond the 15-year proposed project schedule.

6.3.2.4 Alternative 4: Conveyor Transport

Based on the results of the Transportation Feasibility Analysis (see Appendix J), two alternative transportation options have been selected for analysis. These options include Alternative 4a-Edison Road Conveyor Route and Alternative 4b-North American Cutoff Road Conveyor Route. As discussed in Appendix J, if one of these alternative was selected for approval and implementation, it is assumed that excavation and disposal would begin as proposed under the proposed project (i.e., trucks would use the transportation routes identified for the proposed project), while the selected alternative is permitted and constructed (which would take approximately 4 years). Therefore, this analysis assumes that the proposed project (use of trucks to carry soil from the site) would be implemented for the approximately 4 years before Alternative 4a or 4b would begin operation. Once Alternative 4a or 4b was operational, truck trips associated with removal of soil would be reduced, and backfill would continue to be transported in trucks.

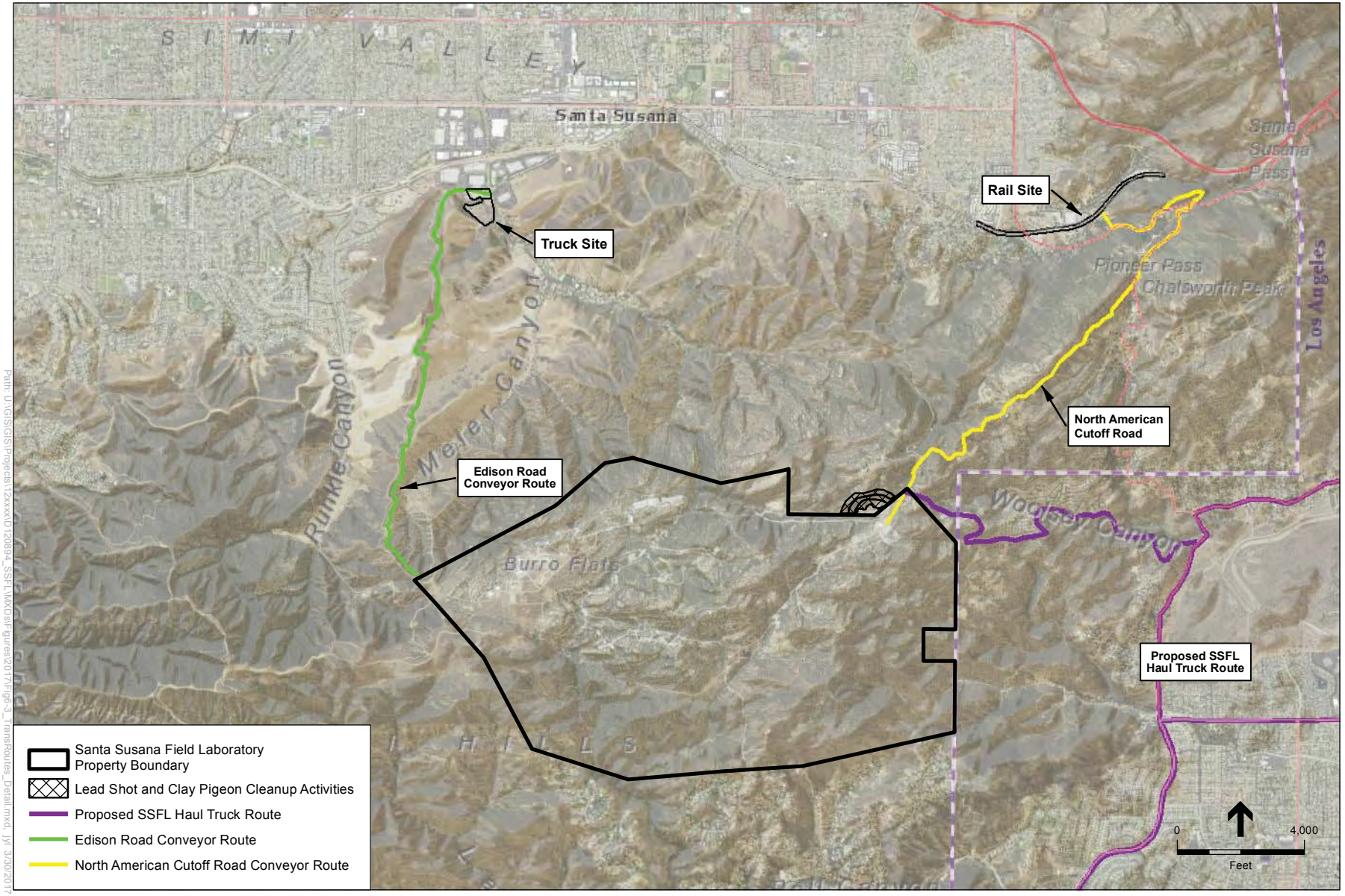
Alternative 4a: Edison Road Overland Conveyor to Truck Route

This alternative consists of constructing an overland conveyor along Edison Road to transport soil from the project site to a truck-loading site in Simi Valley, California. Once at the truck-loading site, soil trucks would be loaded with contaminated soil and would travel to disposal facilities via Tapo Canyon Boulevard to SR 118. The 4.7-acre truck-loading site would be located near the intersection of Guardian Street and Tapo Canyon Road in Simi Valley. This site would require surface grading and paving as a part of construction activities.

The conveyor system would be 2.58 miles long and is shown on **Figure 6-3**. This alternative would require disturbance of approximately 11,400 square feet of land area.

Details about the Edison Road Conveyor Route are presented in the Transportation Feasibility Analysis provided in Appendix J of this PEIR. The conveyor system would follow Edison Road, a private road, as much as possible and would not fully occupy the road right-of-way or prohibit access. Edison Road would remain available to SCE for inspection and maintenance of an existing transmission line along the roadway. The road would also be used as an access road for conveyor maintenance.

Under this alternative all activities associated with the proposed project would be implemented as described in Chapter 3.0, *Project Description*, of this PEIR. However, after the conveyor becomes operational (approximately 4 years after project initiation) the use of Woolsey Canyon Road as a primary route for trucks would be avoided, as trucks would travel to the freeway network from the intersection of Tapo Canyon Road and Guardian Street to SR 118.



SOURCE: ESRI; ESA; KOA

Santa Susana Field Laboratory . 120894

Figure 6-3

Edison Road and North American Cutoff Road Conveyor Alternatives

Environmental Impacts

Aesthetics

Under Alternative 4a, all activities associated with the proposed project would be implemented as described in Chapter 3.0, *Project Description*, of this PEIR. However, Alternative 4a would also result in construction of a 2.58-mile-long conveyor system that would extend from the project site to a new truck-loading site located near the intersection of Guardian Street and Tapo Canyon Road in Simi Valley, California. The conveyor system would be highly visible from various public viewpoints in Simi Valley. In addition, the conveyor system would be constructed on a hillside that is currently undeveloped and contains areas of disturbed and undisturbed native vegetation. Thus, it is expected that the conveyor system would result in a significant visual contrast as compared to existing conditions. Therefore, this alternative would have greater visual impacts compared to the proposed project. Unlike the proposed project, Alternative 4a has the potential to result in significant and unavoidable impacts to scenic vistas and resources as well as visual character. Alternative 4a lighting and glare impacts would be greater than the proposed project as the conveyor system may include lighting at night.

Unlike the proposed project, Alternative 4a may require mitigation for night lighting along the conveyor route. With mitigation, lighting and glare impacts would be less than significant; however, light and glare impacts would be greater than with the proposed project.

Air Quality

Alternative 4a would include the same cleanup areas and site activities as the proposed project but would use a different method of transportation for excavated soil. This alternative would use a 2.58-mile-long conveyor system along Edison Road to transport the soil to a truck-loading site. From the truck site, trucks would travel to SR 118 through Simi Valley and continue to the same disposal facilities identified for the proposed project. Emissions from constructing the Edison Road Overland Conveyor Route are shown in Table 3-7 of the Transportation Feasibility Analysis (see Appendix J of this PEIR). It is not anticipated that construction of the conveyor system would significantly increase air pollutant emissions compared to the proposed project. As shown in Table 4-7 in the Transportation Feasibility Analysis (see Appendix J), Alternative 4a would generate a comparable amount of air pollutant emissions during cleanup activities. Therefore, it is anticipated that Alternative 4a would result in similar air quality impacts as the proposed project. All air quality mitigation measures prescribed for the proposed project would be applicable to Alternative 4a.

Biological Resources

Within the boundary of the project site, this alternative would impact the same biological resources as the proposed project. However, additional biological resources may be significantly impacted under Alternative 4a, due to additional land disturbance associated with the construction and operation of the conveyor system and truck-loading site. Venturan CSS and sandstone outcrops were observed in the vicinity of the conveyor belt and are considered to be locally important communities and sensitive vegetation communities by CDFW. Mitigation requiring restoration of Venturan CSS and sandstone outcrops would be prescribed for any temporary or permanent disturbance, which would entail preparation and implementation of an approved site-

specific restoration plan. Restoration of state and federal jurisdictional water features/habitats would also require mitigation. Appendix J includes a detailed listed of the additional biological resources that would potentially be impacted by construction and operation of this alternative. The conveyor and truck site would be fully decommissioned after completion of the project. After decommissioning is complete, the area would be revegetated using native vegetation. Proposed project significant and unavoidable impacts to special-status species would be exacerbated under Alternative 4a due to the additional land disturbance required to construct the conveyor system. All biological mitigation measures identified for the proposed project would be applicable to Alternative 4a.

Cultural Resources

This alternative would result in the same impacts to cultural resources as the proposed project because this alternative would have the same area of disturbance as the proposed project. However, because this alternative would disturb additional land for construction of the conveyor system and truck-loading site, Alternative 4a would have the potential to impact additional archeological and paleontological resources. The area of the project site and conveyor system is considered sensitive for archaeological resources. One known cultural resource (CA-VEN-734) has been recorded within the route of Alternative 4a and would need to be evaluated for its status as a historical resource or unique archaeological resource under CEQA. Additionally, this alternative traverses seven geological units with low to high paleontological sensitivity. Similar to the proposed project, impacts to any cultural or paleontological resources would likely occur during the construction phase when the soil surface is initially disturbed. During the operation and decommissioning phases, it is unlikely that additional resources would be discovered or disturbed. All cultural resources mitigation measures identified for the proposed project would be applicable to Alternative 4a. However, even with implementation of mitigation measures, impacts would be significant and unavoidable.

Geology and Soils

This alternative would have similar impacts to geology and soils as the proposed project. This alternative would result in excavation of the same areas as the proposed project. Alternative 4a could cause additional impacts compared to the proposed project due to construction and operation of the conveyor system. Because this alternative would include placing infrastructure along a corridor that includes areas with steep, rocky slopes, Alternative 4a has the potential to have greater impacts to soil erosion than the proposed project. However, the proposed project geology and soils mitigation measures would mitigate Alternative 4a impacts to a less-than-significant level. Impacts would be greater than with the proposed project, due to the additional area being disturbed.

Greenhouse Gas Emissions

Construction emissions for the Edison Road Overland Conveyor Route are shown in Table 3-7 in the Transportation Feasibility Analysis (see Appendix J of this PEIR). It is not anticipated that construction of the conveyor system would significantly increase GHG emissions compared to the proposed project. As shown in Table 4-7 in the Transportation Feasibility Analysis (see Appendix J), Alternative 4a would generate a comparable amount of GHG emissions during

cleanup activities. Therefore, it is anticipated that Alternative 4a would result in similar GHG impacts as the proposed project. All GHG mitigation measures prescribed for the proposed project would be applicable to Alternative 4a. With implementation of these mitigation measures, Alternative 4a would result in a less-than-significant impact, similar to the proposed project.

Hazards and Hazardous Materials

Alternative 4a would pose the same impacts involving hazards and hazardous materials as the proposed project for onsite activities. However, the conveyor system considered for Alternative 4a would reduce the distance hazardous materials would be transported through residential areas. Like the proposed project, cleanup activities would result in short-term emissions of diesel particulate matter, which is a toxic air contaminant. There are no schools or daycare centers within the cleanup area for the proposed project, though the proposed project includes transportation routes that pass schools and daycares. The Alternative 4a conveyor corridor would not pass schools and daycares, but once the soil is deposited at the truck-loading site, it would be conveyed by trucks along transportation routes that include residences, schools, and daycares. Alternative 4a would result in the same number of daily truck trips as the proposed project (i.e., a maximum of 96 round trips per day). Therefore, Alternative 4a health risk impacts from onsite diesel particulate matter emissions would be slightly less than the proposed project but health risk impacts from the off-site truck transport of material would be the same as the project. Health risk impacts would be slightly less than the proposed project and would remain a less than significant impact under Alternative 4a.

Under Alternative 4a, hazards impacts would be similar to the proposed project, and all proposed project mitigation measures related to hazards would be applicable. Similar to the proposed project, impacts related to the transport, disposal and use of hazardous materials would be less than significant with Mitigation Measures TRANS-1, HAZ-2, and HAZ-5; impacts related to the reasonably foreseeable upset and accident conditions would remain significant and unavoidable after incorporation of mitigation.

Hydrology and Water

This alternative would include all impacts to hydrology and water quality as the proposed project and would include additional impacts associated with the construction and operation of the conveyor system and truck site. This alternative would have limited permanent ground disturbance and would be designed to reduce adverse effects on natural drainages. The conveyor corridor for Alternative 4a would pass the Arroyo Simi River. Any work within the channel, banks or associated riparian vegetation of a drainage feature would require a permit and approval from USACE, LARWQCB, and/or CDFW prior to construction. Obtaining the permit and compliance with mitigation related to stormwater management would ensure mitigation for any adverse effects on natural drainages. In addition, all hydrology and water quality mitigation measures prescribed for the proposed project would also be applicable to Alternative 4a, and impacts would be less than significant with mitigation incorporated. Impacts for this alternative would be greater than the proposed project, due to the additional area being disturbed.

Land Use and Planning

Alternative 4a would result in similar impacts involving land use and planning as the proposed project, including significant and unavoidable impacts related to inconsistency with Ventura County General Plan goals and policies. The conveyor system would be located on lands designated as Open Space in the Ventura County General Plan. It would also cross lands designated as Open Space and Business Park in the Simi Valley General Plan. Construction of the conveyor system would be consistent with the land use goals and policies of the Ventura County General Plan and Simi Valley General Plan. Both the Ventura County and Simi Valley Zoning Ordinances allow the construction of pipelines, transmission lines, and aboveground facilities in the designated zones. Hazardous waste collection, treatment, and storage facilities are allowed in the Open Space zones in Ventura County with obtainment of a zoning clearance, but it is unclear if these activities are allowed in the Open Space zone for Simi Valley. A detailed discussion of the general plans and zoning ordinances as it applies to this alternative is included in Appendix J. Similar to the proposed project, Alternative 4a would have significant and unavoidable land use and planning impacts even with implementation of mitigation measures identified for the proposed project.

Noise

Alternative 4a would include the same onsite noise impacts to the campground and ranger's house at Sage Ranch Park as the proposed project. However, this alternative would require additional offsite construction activities to build the conveyor system. These construction activities are not anticipated to take place during evening and nighttime hours. The closest noise-sensitive uses to this alternative are single family residences located approximately 115 feet from the truck-loading site in unincorporated Ventura County. The truck-loading site would require surface grading and paving during the conveyor system construction period. During the grading and paving activities, these nearest residential uses would be exposed to temporary increased noise levels. However, construction activities occurring during the daytime hours are not considered to be a sensitive time period for residential uses under the *County of Ventura Construction Noise Threshold Criteria and Control Plan.* Given that construction activities would only occur during the daylight hours, no impacts would occur from construction of the truck-loading facility. Furthermore, vibration levels at 100 feet would not exceed the FTA's vibration criteria for building damage (even at buildings categorized as being extremely susceptible to vibration damage) or human annoyance. Given that the closest sensitive use is approximately 115 feet from the truck-loading facility, the vibration levels at this closest offsite receptor would not result in any adverse effects. Construction-related noise and vibration would be the same as those occurring under the proposed project.

The closest sensitive uses to the conveyor route are over 1,200 feet from the route. Therefore, the noise levels associated with this system along the route would not adversely affect any sensitive receptors. This alternative would have similar significant and unavoidable ambient traffic noise impacts as identified for the proposed project on Woolsey Canyon Road during the first 4 years of cleanup activities. All noise mitigation measures prescribed for the proposed project would be applicable to Alterative 4a. However, once the conveyor system is construction Mitigation

Measure NOISE-3 would no longer be applicable. Even with implementation of mitigation measures, noise impacts associated with Alternative 4a would be significant and unavoidable, although reduced in comparison to the proposed project.

Transportation and Traffic

For this alternative, a maximum total of up to 96 trucks per day would traverse Tapo Canyon Road to access the conveyor system truck site and to connect to SR 118. This would result in congestion on Tapo Canyon Road, south of the SR 118 interchange, which would be considered a significant effect. This impact could be mitigated if the trips are limited to times outside of peak traffic hours. Alternative 4a would generate a similar amount of traffic within the proposed project traffic study area as the proposed project because, like the proposed project, a maximum of 96 truck trips per day would be generated by Alternative 4a. All transportation and traffic mitigation measures prescribed for the proposed project would be applicable to Alternative 4a. Similar to the proposed project, Alternative 4a traffic impacts would be significant and unavoidable.

Utilities and Services Systems

Under Alternative 4a, the same quantity of soil and debris would be removed from the project site. Similar to the proposed project, the facilities identified for disposal of waste generated from Alternative 4a would have sufficient permitted capacity. Therefore, similar to the proposed project, impacts related to landfill capacity would be less than significant and no mitigation would be required. In addition, the Alternative 4a waste stream would not exceed the available permitted capacity and permitted daily throughput of relevant landfills, which means that Alternative 4a would comply with federal, state, and local statutes related to solid waste disposal. Similar to the proposed project, this impact would be less than significant and no mitigation would be required.

Energy Conservation

Construction equipment used to construct the Alternative 4a conveyor system and truck-loading site would require a total of 175,323 gallons of diesel and 10,291 gallons of gasoline (see Appendix J of this PEIR). This alternative has the potential to consume incrementally less petroleum than the proposed project because of the use of the conveyor system for a 2.58-mile length of the transportation route instead of trucks. However, Alternative 4a would still use trucks to carry soil from the truck-loading site. Thus, the difference in petroleum consumption between this alternative and the proposed project would not be substantial. This alternative would also require a significant amount of electricity to power the conveyor system (see Appendix J for details). It is anticipated that SCE would have the capacity to provide electrical service to power the conveyor system. All energy conservation mitigation measures identified for the proposed project would be applicable to Alternative 4a. However, additional mitigation measures may be necessary to conserve electricity that would be used to power the conveyor system. Alternative 4a would result in less-than-significant impacts with mitigation incorporated with respect to energy conservation; however, impacts would be greater than the proposed project.

Relationship of the Alternative to Project Objectives

Alternative 4a would meet all of the project objectives, including cleanup of soil and groundwater contaminants in compliance with applicable regulatory standards and the protection of human health and the environment. Cleanup activities under Alternative 4a would prevent or minimize the migration of contaminated media to offsite areas. This alternative would also use in situ cleanup methods, to the extent practicable, to minimize physical impacts to the environment. This alternative would be compatible with Ventura County's designation of the property. Compared to the proposed project, Alternative 4a would not meet the objective of recognizing the unique biological and cultural significance of the project site through protection of resources and consistency with applicable laws and regulations for such resources since it would increase the area of disturbance with the construction of the conveyor system and result in additional impacts to biological and cultural resources. Additionally, this alternative would not meet the objective to remediate the site in an expedient and cost-effective manner, as this alternative would cost approximately $80 million to develop and $464 million to operate, compared to $444 million to operate the proposed project (see Section 4.1.6 of Appendix J for details).

Alternative 4b: North American Cutoff Road Overland Conveyor to Rail Route

This alternative consists of constructing an overland conveyor along North American Cutoff Road to transport soil from the project site to a new rail-car loading facility in Simi Valley for transport by rail to disposal sites. The rail site is located near the east end of Smith Road. The conveyor system would be 3.10 miles long and require the disturbance of approximately 20,400 square feet of land area. Figure 6-3 shows the location of the Alternative 4b conveyer route and rail site. Details about the North American Cutoff overland conveyor are included in the Transportation Feasibility Analysis provided in Appendix J of this PEIR. Under this alternative all activities associated with the proposed project would be implemented as described in Chapter 3.0, *Project Description*, of this PEIR. However, after the conveyor becomes operational (approximately 4 years after project initiation) the use of trucks to transport contaminated soil would be eliminated, although backfill soil would still be transported to the project site via truck on Woolsey Canyon Road.

Environmental Impacts

Aesthetics

Under Alternative 4b, all activities associated with the proposed project would be implemented as described in Chapter 3.0, *Project Description*, of this PEIR. However, Alternative 4b would also result in the construction of a 3.10-mile-long conveyor system that would extend from the project site to a rail site located near the east end of Smith Road in Simi Valley, California. The conveyor system would be highly visible from various public viewpoints in Simi Valley. In addition, the conveyor system would be constructed on a hillside that is currently mostly undeveloped and contains areas of disturbed and undisturbed native vegetation. Thus, it is expected that the conveyor system would result in a significant visual contrast compared to existing conditions. Therefore, this alternative would have greater visual impacts compared to the proposed project. Unlike the proposed project, Alternative 4b has the potential to result in significant and unavoidable impacts to scenic vistas and resources as well as visual or community character. Alternative 4b lighting and glare impacts would be greater than the proposed project as the

conveyor system may include lighting at night. Unlike the proposed project, Alternative 4b may require mitigation for night lighting along the conveyor route. With implementation of mitigation measures, lighting and glare impacts would be less than significant, similar to the proposed project.

Air Quality

Alternative 4b would include the same cleanup areas and site activities as the proposed project but would use a different method of transportation for excavated soil. The total construction emissions for the conveyor system and rail site would not exceed SCAQMD or VCAPCD regional thresholds; however, the annual Simi Valley threshold would be exceeded for NOx. Additionally, the operational emissions from this alternative would exceed the SCAQMD's regulatory threshold for NOx. Alternative 4b emissions generated during cleanup activities would greatly exceed the proposed project emissions for all criteria pollutants. This is because diesel powered freight trains would combust more fuel than the trucks used under the proposed project as freight train emissions are not controlled by the state to the same extent as on-road trucks due to Tier 4 emissions control technologies that are not yet commercialized and available (CARB, 2016). Details on emissions are presented in Tables 3-11 and 3-12 of the Traffic Feasibility Analysis (see Appendix J). Alternative 4b's violation of air quality thresholds means that this alternative would have substantially more impacts to air quality than the proposed project. All project air quality mitigation measures would be applicable to Alternative 4b. However, impacts would remain significant and unavoidable after implementation of mitigation.

Biological Resources

Within the boundary of the project site, this alternative would impact the same biological resources as the proposed project. However, additional biological resources may be significantly impacted under Alternative 4b due to the additional land disturbance required for construction and operation of the conveyor system and rail car-loading site. Vegetation communities and sensitive habitats in the general vicinity of the North American Cutoff Road Overland Conveyor Route include Venturan CSS, chaparral, and sandstone cliffs/outcrops with varying densities of coastal sage scrub species. Venturan CSS and sandstone outcrops are considered by Ventura County to be locally important communities and are also considered by CDFW to be sensitive vegetation communities. These communities, as well as chaparral, may support special-status wildlife and plants. Portions of the Arroyo Simi supporting riparian forest vegetation are adjacent to the northern boundary of the rail site. Because the Arroyo Simi is a state and federally regulated watercourse, a permit from USACE, LARWQCB, and/or CDFW would be needed prior to any work within the channel, or its banks and associated riparian vegetation. Appendix J includes a detailed list of the additional biological resources that would potentially be impacted by the construction and operation of this alternative. After decommissioning is complete, the area would be revegetated using native vegetation. The proposed project's significant and unavoidable impacts to special-status species would be exacerbated under Alternative 4b due to the additional land disturbance required to construct the conveyor system. All biological mitigation measures identified for the proposed project would be applicable to Alternative 4b.

Cultural Resources

This alternative would result in the same impacts to cultural resources as the proposed project because this alternative would have the same area of disturbance as the proposed project. However, because this alternative would disturb additional land for construction of the conveyor system, it is anticipated that Alternative 4b would impact additional archeological and paleontological resources. The area of the project site and conveyor system is considered sensitive for archaeological resources. The SCCIC records search indicated one previously recorded cultural resource (CA-VEN-655) within the North American Cutoff Road Overland Conveyor Route. One additional resource (P-56-152383) is located immediately north of, and may extend into, the rail site. The northern portion of this route and the rail site should be considered to have a high sensitivity for both prehistoric and historic-period archaeological resources and built historic resources. In general, the conveyor corridor for this alternative should be considered moderately to highly sensitive for cultural resources, with the rail site, the northern portion of the route, and areas with low slope having a higher sensitivity. Similar to the proposed project, impacts to any cultural or paleontological resources would likely occur during the construction phase when the soil surface is initially disturbed. During the operations and decommissioning phases it is unlikely that additional resources would be discovered or disturbed. All cultural resources mitigation measures identified for the proposed project would be applicable to Alternative 4b. However, even with implementation of mitigation measures, impacts would be significant and unavoidable.

Geology and Soils

This alternative would have similar impacts to geology and soils as the proposed project. This alternative would result in excavation of the same areas as the proposed project. Alternative 4b could cause additional impacts compared to the proposed project due to the construction and operation of the conveyor system. Because this alternative would include placing infrastructure along a corridor that includes areas with steep, rocky slopes, Alternative 4b has the potential to have greater impacts to soil erosion than the proposed project. However, the proposed project geology and soils mitigation measures would mitigate Alternative 4b impacts to a less-than-significant level. Impacts would be greater than the less-than-significant impacts identified for the proposed project, due to the additional area being disturbed.

Greenhouse Gas Emissions

Emissions for an overland conveyor along North American Cutoff Road are presented in Tables 3-13 and 3-14 in the Transportation Feasibility Analysis (see Appendix J of this PEIR). It is not anticipated that construction of the conveyor system would significantly increase GHG emissions compared to the proposed project. As shown in the Transportation Feasibility Analysis (see Appendix J), Alternative 4b would generate a substantially higher amount of GHG emissions during cleanup activities. However, similar to the proposed project, this alternative would be expected to implement mitigation measures to reduce GHG impacts to less than significant. Therefore, it is anticipated that Alternative 4b would result in similar GHG impacts as the proposed project. All GHG mitigation measures prescribed for the proposed project would be applicable to Alternative 4b. With implementation of these mitigation measures, Alternative 4b would result in a less-than-significant impact, similar to the proposed project.

Hazards and Hazardous Materials

Alternative 4b would pose the same impacts involving hazards and hazardous materials as the proposed project for onsite activities. However, the conveyor system corridor considered for Alternative 4b would avoid the transportation of hazardous materials through residential areas along the proposed Woolsey Canyon Road truck route for a portion of the project. Like the proposed project, cleanup activities would result in short-term emissions of diesel particulate matter, which is a toxic air contaminant. The Alternative 4b conveyor corridor would not pass schools and daycares because contaminated soil and debris would be transported to disposal facilities via freight train instead of the truck route identified for the proposed project. Therefore, hazards impacts to schools and daycare facilities would be reduced under Alternative 4b. However, diesel powered freight trains would pass by residential uses and would combust more fuel than the trucks used under the proposed project as freight train emissions are not controlled by the state to the same extent as on-road trucks due to Tier 4 emissions control technologies that are not yet commercialized and available (CARB, 2016). Therefore, Alternative 4b health risk impacts from onsite diesel particulate matter emissions would be slightly less than the proposed project but health risk impacts from the offsite train transport of material would be greater than the proposed project. Health risk impacts could potentially be greater than the proposed project, and potentially result in a significant and unavoidable impact under Alternative 4b even with implementation of Mitigation Measures HAZ-2 and TRANS-1. As discussed, freight train emissions are not controlled by the state to the same extent as on-road trucks and there would be no feasible measures to reduce freight train emissions to the same level as on-road trucks.

Under Alternative 4b, hazard impacts would be expected to be less than proposed project, and hazards and hazardous materials mitigation measures would be applicable. Impacts related to the transport, disposal and use of hazardous materials, as well as reasonably foreseeable upset and accident conditions would be less than the project as the use of trucks to transport contaminated soil would be reduced. Alternative 4b impacts involving hazards and hazardous materials would be less than significant with mitigation incorporated.

Hydrology and Water

This alternative would include all impacts to hydrology and water quality as the proposed project and would include additional impacts associated with the construction and operation of the conveyor system and truck site. This alternative would have limited permanent ground disturbance and would be designed to reduce adverse effects on natural drainages. The conveyor corridor for Alternative 4b may pass the Arroyo Simi River. Any work within the channel, banks or associated riparian vegetation of a drainage feature would require a permit and approval from USACE, LARWQCB, and/or CDFW prior to construction. Obtaining the permit and compliance with mitigation related to stormwater management would ensure mitigation for any adverse effects on natural drainages. In addition, all hydrology and water quality mitigation measures prescribed for the proposed project would also be applicable to Alternative 4b. Alternative 4b hydrology and water quality impacts would be less than significant with mitigation incorporated. Impacts would be greater than with the proposed project, due to the additional area being disturbed.

Land Use and Planning

Alternative 4b would result in the same impacts involving land use and planning as the proposed project, including significant and unavoidable impacts related to inconsistency with the Ventura County General Plan goals and policies. The North American Cutoff Road Overland Conveyor would be located on lands designated as Open Space and Existing Community in the Ventura County General Plan. It would also cross lands designated as Open Space and Business Park in the Simi Valley General Plan. Alternative 4b could be consistent with the land use goals and policies of the Ventura County General Plan and Simi Valley General Plan. Ventura County Zoning Ordinances allow the construction of pipelines, transmission lines, and aboveground facilities in the designated zones. Hazardous waste collection, treatment, and storage facilities are allowed in the Open Space zones in Ventura County with obtainment of a zoning clearance.

Additionally, the rail site would be located within Open Space, Commercial Recreation, and Light Industrial zones in Simi Valley. The Open Space zone does not identify hazardous waste storage/transfer facilities and railroad facilities among the allowable uses in this zone. In addition, railroad facilities are not allowed in the Commercial and Light Industrial zones; therefore, a zone change would need to be requested from the City of Simi Valley in order to allow development of the rail site. A detailed discussion of the general plans and zoning ordinances is included in Appendix J. Similar to the proposed project, Alternative 4b would have significant and unavoidable land use and planning impacts even with implementation of mitigation measures identified for the proposed project.

Noise

Alternative 4b would include the same onsite noise impacts to the campground and ranger's house at Sage Ranch Park as the proposed project. However, this alternative would require additional offsite construction activities to build the conveyor system. The nearest single-family residences to the overland conveyor route would not likely be subject to noise-related disturbances during the evening and nighttime periods. While there is a chance that conveyor construction noise could exceed Ventura County thresholds if construction extends into evening or nighttime hours, these times are anticipated to be rare and any impacts would be temporary because the conveyor is estimated to take 15 months to construct. No noise-sensitive uses would be located directly adjacent to and along the proposed overland conveyor route; therefore, the operational noise levels associated with this system along the conveyor route would not adversely affect any sensitive receptors. While this alternative would increase train traffic on the rail corridor used to transport soil from the rail site to a solid waste disposal facility, the noise generated by the additional train trips is likely to be the same or less than the noise generated by the truck trips used for the proposed project. This alternative would have similar significant and unavoidable ambient traffic noise impacts as identified for the proposed project on Woolsey Canyon Road during the first 4 years of the cleanup activities. All noise mitigation measures prescribed for the proposed project would be applicable to Alterative 4a. However, once the conveyor system is constructed Mitigation Measure NOISE-3 would no longer be applicable. Even with implementation of mitigation measures, noise impacts associated with Alternative 4b would be significant and unavoidable, although reduced in comparison to the proposed project.

Transportation and Traffic

Alternative 4b uses a conveyor system to transport contaminated soil from the project site directly to an existing rail line. Therefore, this option would result in a substantial reduction in project-related truck traffic. Under this alternative, soils contaminated with radioactive material would be transported by truck via Woolsey Canyon Road. Clean backfill would also be transported to the site via Woolsey Canyon Road. Significant impacts resulting from project-related traffic at affected intersections could be reduced if truck hauling activities were required to occur outside of peak traffic periods. All transportation and traffic mitigation measures prescribed for the proposed project would be applicable to Alternative 4b. However, even with implementation of these mitigation measures, Alternative 4b traffic impacts would be significant and unavoidable, although reduced in comparison to the significant and unavoidable impacts identified for the proposed project.

Utilities and Services Systems

Under Alternative 4b, the same total volume of soil and debris would be disposed at landfills. However, the disposal of contaminated soil would be limited to solid waste facilities that are located along the train routes and have capacity to accept the project waste. Similar to the proposed project, the facilities identified for disposal of waste generated from Alternative 4b would have sufficient permitted capacity. Therefore, similar to the proposed project, impacts related to landfill capacity would be less than significant and no mitigation would be required. In addition, the Alternative 4b waste stream would not exceed the available permitted capacity and permitted daily throughput of relevant landfills, which means that Alternative 4b would comply with federal, state, and local statutes related to solid waste disposal. Similar to the proposed project, this impact would be less than significant and no mitigation would be required.

Energy Conservation

Alternative 4b has the potential to use significantly more petroleum than the proposed project. As shown in the Traffic Feasibility Analysis (see Appendix J of this PEIR), freight trains have the potential to use significantly more diesel than trucks (based on the distance traveled). This alternative would also require a significant amount of electricity to power the conveyor system. Furthermore, trucks used to transport clean soil onsite would consume diesel. It is anticipated that SCE would have the capacity to provide electrical service to power the conveyor system. All proposed project energy conservation mitigation measures would be applicable to Alternative 4b. However, additional mitigation measures would be necessary to conserve diesel associated with the use of freight trains and trucks and electricity that would be used to power the conveyor system. With implementation of these mitigation measures, Alternative 4b would result in less-than-significant impacts with respect to energy conservation, although impacts would be greater than with the proposed project.

Relationship of the Alternative to Project Objectives

Alternative 4b would meet all of the project objectives, including cleanup of soil and groundwater contaminants in compliance with applicable regulatory standards and the protection of human health and the environment. Cleanup activities under Alternative 4b would prevent or minimize the migration of contaminated media to offsite areas. This alternative would also use in situ

cleanup methods, to the extent practicable, to minimize physical impacts to the environment. This alternative would be compatible with Ventura County's designation of the property. Compared to the proposed project, Alternative 4b would not meet the objective of recognizing the unique biological and cultural significance of the project site through protection of resources and consistency with applicable laws and regulations for such resources since it would increase the area of disturbance with the construction of the conveyor system and result in additional impacts to biological and cultural resources. Additionally, this alternative would not meet the objective to remediate the site in an expedient and cost-effective manner, as this alternative would cost approximately $86 million to develop and $672 million to operate, compared to $444 million to operate the proposed project (see Section 4.1.6 of Appendix J for details).

6.4 Environmentally Superior Alternative

Section 15126.6(e)(2) of the CEQA Guidelines indicates that an analysis of alternatives to a proposed project shall identify an environmentally superior alternative among the alternatives evaluated in an EIR and that if the "no project" alternative is the environmentally superior alternative, the EIR shall identify another environmentally superior alternative among the remaining alternatives. With respect to identifying an Environmentally Superior Alternative among those analyzed in this PEIR, the range of feasible alternatives includes:

- Alternative 1: No Project
- Alternative 2: Preliminary Estimated AOC Exceptions Alternative
- Alternative 3: Reduced Truck Trip Alternative
- Alternative 4a: Edison Overland Conveyor Alternative
- Alternative 4b: North American Cutoff Alternative

A comparative summary of the environmental impacts anticipated with each alternative to the environmental impacts associated with the project is provided in **Table 6-3**, based on the detailed evaluation of the potential impacts associated with each alternative provided in the previous sections. As indicated in Table 6-3, the No Project Alternative would have less impact than the proposed project or other alternatives as it would have no impacts on the environment. Further, it would avoid the project's significant and unavoidable impacts associated with air quality, biological resources, cultural resources, hazards and hazardous materials, land use, and noise. Therefore, the No Project Alternative is considered the environmentally superior alternative.

However, the No Project Alternative would not meet any project objectives, would not meet state and federal requirements, and would not provide the benefits associated with site cleanup. The No Project Alternative would not result in the removal or treatment of contaminated soils and groundwater.

In accordance with the CEQA Guidelines' requirement to identify an Environmentally Superior Alternative other than the No Project Alternative, a comparative evaluation of the remaining alternatives indicates that Alternative 2, the Preliminary Estimated AOC Exception Alternative, would have fewer impacts than the proposed project and other alternatives selected for analysis.

Therefore, in accordance with CEQA Guidelines Section 15126.6(e), the Alternative 2 is identified as the "environmentally superior alternative." Alternative 2 would also meet all project objectives.

TABLE 6-3
COMPARISON OF IMPACTS ASSOCIATED WITH THE PROJECT AND THE ALTERNATIVES

	Project Impact	Alternative 1 No Project Alternative	Alternative 2 Preliminary Estimated AOC Exceptions Alternative	Alternative 3 Reduced Truck Trip Scenario	Alternative 4a Edison Overland Conveyor Route	Alternative 4b North American Cutoff Overland Conveyor Route
Aesthetics						
Scenic Vistas	LSM	Less (NI)	Similar (LSM)	Greater (LSM)	Greater (LSM)	Greater (LSM)
Scenic Resources	LTS	Less (NI)	Less (LTS)	Greater (LTS)	Greater (LSM)	Greater (LSM)
Visual or Community Character	LSM	Less (NI)	Less (LSM)	Greater (LSM)	Greater (LSM)	Greater (LSM)
Light and Glare	LTS	Less (NI)	Less (LSM)	Greater (LSM)	Greater (LSM)	Greater (LSM)
Air Quality						
Air Quality Plan Conflicts	S&U	Less (NI)	Similar (S&U)	Less (S&U)	Similar (S&U)	Greater (S&U)
Air Quality Standards	S&U	Less (NI)	Similar (S&U)	Less (S&U)	Similar (S&U)	Greater (S&U)
Exposure of Sensitive Receptors	LTS	Less (NI)	Similar (LTS)	Greater (LTS)	Less (LTS)	Less (LTS)
Cumulatively Considerable Net Increase	LTS	Less (NI)	Similar (LTS)	Greater (LTS)	Similar (LTS)	Similar (LTS)
Objectionable Odors	LTS	Less (NI)	Less (LTS)	Greater (LTS)	Similar (LTS)	Similar (LTS)
Biological Resources						
Braunton's Milk-Vetch	S&U	Less (NI)	Less (S&U)	Greater (S&U)	Greater (S&U)	Greater (S&U)
Special-Status Species	S&U	Less (NI)	Less (S&U)	Greater (S&U)	Greater (S&U)	Greater (S&U)
Riparian Habitat	LSM	Less (NI)	Less (LSM)	Greater (LSM)	Greater (LSM)	Greater (LSM)
Protected Wetlands And Waters	LSM	Less (NI)	Less (LSM)	Greater (LSM)	Greater (LSM)	Greater (LSM)
Movement of Fish or Wildlife	LSM	Less (NI)	Less (LSM)	Greater (LSM)	Greater (LSM)	Greater (LSM)
Conflict with Local Policies	S&U	Less (NI)	Less (S&U)	Similar (LSM)	Greater (LSM)	Greater (LSM)
Habitat Conservation Plans	NI	Similar (NI)	Similar (NI)	Similar (NI)	Similar (NI)	Similar (NI)
Cultural Resources						
Archaeological Resources	S&U	Less (NI)	Less (S&U)	Similar (S&U)	Greater (S&U)	Greater (S&U)

	Project Impact	Alternative 1 No Project Alternative	Alternative 2 Preliminary Estimated AOC Exceptions Alternative	Alternative 3 Reduced Truck Trip Scenario	Alternative 4a Edison Overland Conveyor Route	Alternative 4b North American Cutoff Overland Conveyor Route
Tribal Cultural Resources	S&U	Less (NI)	Less (S&U)	Similar (S&U)	Greater (S&U)	Greater (S&U)
Historical Resources	NI	Similar (NI)	Similar (NI)	Similar (NI)	Similar (NI)	Greater (S&U)
Paleontological Resources	LSM	Less (NI)	Less (LSM)	Similar (LSM)	Greater (LSM)	Greater (LSM)
Buried Resources	LSM	Less (NI)	Less (LSM)	Similar (LSM)	Greater (LSM)	Greater (LSM)
Geology and Soils						
Earthquake Faults and Seismic Events	LSM	Less (NI)	Less (LSM)	Greater (LSM)	Greater (LSM)	Greater (LSM)
Soil Erosion or Loss of Topsoil	LSM	Less (NI)	Less (LSM)	Greater (LSM)	Greater (LSM)	Greater (LSM)
Unstable Geologic Units	LSM	Less (NI)	Less (LSM)	Greater (LSM)	Greater (LSM)	Greater (LSM)
Problematic Soils	LSM	Less (NI)	Less (LSM)	Greater (LSM)	Greater (LSM)	Greater (LSM)
Greenhouse Gas Emissions						
GHG Emissions	LSM	Less (NI)	Similar (LSM)	Less (LSM)	Similar (LSM)	Greater (LSM)
GHG Reduction Plans	LTS	Less (NI)	Similar (LTS)	Similar (LTS)	Similar (LTS)	Similar (LTS)
Hazards and Hazardous Materials						
Transport, Disposal, and Use of Hazardous Materials	LSM	Greater (NI)	Less (LSM)	Similar (LSM)	Similar (LSM)	Greater (S&U)
Reasonably Foreseeable Upset and Accident Conditions	S&U	Greater (NI)	Less (S&U)	Similar (S&U)	Similar (S&U)	Less (S&U)
Hazardous Materials Near a School	LSM	Less (NI)	Less (LSM)	Similar (LSM)	Similar (LSM)	Less (LTS)
Interfere with Emergency Response Plan	LSM	Less (NI)	Less (LSM)	Similar (LSM)	Less (LSM)	Less (LTS)
Wildfire Risk	LSM	Less (NI)	Similar (LSM)	Similar (LSM)	Similar (LSM)	Similar (LSM)
Use of Chemical Amendments	LSM	Less (NI)	Less (LSM)	Similar (LSM)	Similar (LSM)	Similar (LSM)
Hydrology and Water Quality						
Water Quality Standards	LSM	Greater (NI)	Less (LSM)	Similar (LSM)	Greater (LSM)	Greater (LSM)
Groundwater Supplies and Recharge	LTS	Less (NI)	Less (LTS)	Similar (LTS)	Greater (LTS)	Greater (LTS)

	Project Impact	Alternative 1 No Project Alternative	Alternative 2 Preliminary Estimated AOC Exceptions Alternative	Alternative 3 Reduced Truck Trip Scenario	Alternative 4a Edison Overland Conveyor Route	Alternative 4b North American Cutoff Overland Conveyor Route
Drainage Patterns, Erosion, and Siltation	LSM	Less (NI)	Less (LSM)	Similar (LSM)	Greater (LSM)	Greater (LSM)
Drainage Patterns and Flooding	LSM	Less (NI)	Less (LSM)	Similar (LSM)	Greater (LSM)	Greater (LSM)
Stormwater Drainage and Polluted Runoff	LSM	Less (NI)	Less (LSM)	Similar (LSM)	Greater (LSM)	Greater (LSM)
Land Use and Planning						
Conflicts with Land Use Plans, Policies or Regulation	S&U	Greater (S&U)	Similar (S&U)	Similar (S&U)	Similar (S&U)	Similar (S&U)
Noise and Vibration						
Conflict with General Plans or Noise Ordinances	LSM	Less (NI)	Similar (LSM)	Similar (LSM)	Similar (LSM)	Similar (LSM)
Ground-borne Vibration Levels	LTS	Less (NI)	Less (LTS)	Greater (LTS)	Similar (LTS)	Similar (LTS)
Increase in Ambient Noise Levels	S&U	Less (NI)	Similar (S&U)	Similar (S&U)	Less (S&U)	Less (S&U)
Transportation						
Conflict with Applicable Plans, Ordinances, or Policies	SU	Less (NI)	Similar (S&U)	Similar (S&U)	Less (S&U)	Less (S&U)
Traffic Safety Hazards	LSM	Less (NI)	Similar (LSM)	Similar (LSM)	Less (LSM)	Less (LTS)
Emergency Access	LTS	Less (NI)	Less (LTS)	Less (LTS)	Less (LTS)	Less (LTS)
Utilities and Service Systems						
Compliance with Federal, State and Local statutes and Regulations	LTS	Less (NI)	Less (LTS)	Similar (LTS)	Similar (LTS)	Similar (LTS)
Energy Consumption						
Energy Efficiency	LSM	Less (NI)	Less (LSM)	Similar (LSM)	Greater (LSM)	Greater (LSM)
Transportation Energy	LSM	Less (NI)	Less (LSM)	Similar (LSM)	Greater (LSM)	Greater (LSM)
Energy Capacity	LTS	Less (NI)	Less (LTS)	Similar (LTS)	Greater (LTS)	Greater (LTS)
Energy Regulations	LTS	Less (NI)	Similar (LTS)	Similar (LTS)	Similar (LTS)	Similar (LTS)

NI = No impact
LTS = Less than significant
S&U = Significant and unavoidable
LSM = Less than significant with mitigation incorporated

CHAPTER 7
Impacts Found Not to Be Significant

As required by Section 15128 of the CEQA Guidelines, an EIR shall contain a brief discussion stating the reasons why various possible significant effects of a project were determined not to be significant and are therefore not discussed in detail in the EIR. In accordance with the CEQA Guidelines, this chapter discusses the environmental issue areas where impacts were found to not be significant. These discussions address the CEQA Guidelines Appendix G Checklist questions for each of the environmental topic areas. In addition, Ventura County's Initial Study Assessment Guidelines have been incorporated, as appropriate.

7.1 Agriculture and Forestry Resources

Impact 7.1-1: Would implementation of the overall site cleanup or initial activities convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to a non-agriculture use or would implementation of the proposed project conflict with existing zoning for agricultural use, or a Williamson Act contract?

As discussed in Section 4.9, *Land Use*, of this PEIR, the project site is designated as Open Space (OS) in the Ventura County General Plan and zoned Rural Agricultural (RA-5) (Administrative Areas I through IV) and Open Space (OS-160) (Northern and Southern Undeveloped Areas). Figures 4.9-1 and 4.9-2 show the General Plan designated land uses and zoning at the project site. However, the current RA-5 zoning is not consistent with the General Plan OS designation, which means that current zoning could not be used for development, including agriculture, unless a successful General Plan Amendment was processed by the landowner. No Farmland, agricultural uses, or related operations are present within the project site or surrounding area. According to the California Department of Conservation (CDC), pursuant to Farmland Mapping and Monitoring Program, there are no farmlands located within the vicinity of the project site (CDC, 2016). Furthermore, as explained in Section 3.6, *Overall Site Cleanup*, of this PEIR, the purpose of the project is to clean up contaminated soil and groundwater at the project site. As such, implementation of the overall site cleanup and initial activities would result in removal and remediation of potentially hazardous materials at the site. Future development is unknown at this time and may be subject to other discretionary actions by the County of Ventura, DTSC, or other government agencies, including environmental review as appropriate pursuant to CEQA. Thus, for the purpose of this analysis, the existing land use at the project site would not change. Therefore, the project would not convert any Prime Farmland, Unique Farmland, or Farmland of

Statewide Importance to a non-agricultural use, and no impact would occur and no mitigation measures would be necessary.

Impact 7.1-2: Would implementation of the overall site cleanup or initial activities conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526) or timberland zoned Timberland Production (as defined by Government Code Section 51140(g)) or would implementation of the overall site cleanup or initial activities result in the loss of forest land or conversion of forest land to non-forest use?

No farmland, agricultural uses, or related operations, including forest or timberland, are present within the project site or surrounding area (CDC, 2012). Furthermore, the project site is not located on land that land that has any forest or timberland zoning or designation. The purpose of the project is to clean up contaminated soil and groundwater at the project site. As such, implementation of the overall site cleanup and initial activities would result in removal and remediation of potentially hazardous materials at the site. The site is not zoned as forest land or timberland (CDC, 2012). Thus, the project would not conflict with forest land or timberland zoning or result in the loss of forest land or conversion of forest land or timberland to non-forest uses. Therefore, no impact would occur and no mitigation measures would be necessary.

Impact 7.1-3: Would implementation of the overall site cleanup or initial activities involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

As discussed above, no farmland, agricultural uses, or related operations, including forest or timberland, are present within the project site or surrounding area, nor is the site zoned for such uses (CDC, 2012). Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

7.2 Geology and Soils

Impact 7.2-1: Would implementation of the overall site cleanup or initial activities have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

The purpose of the project is to clean up contaminated soil and groundwater at the project site. As such, implementation of the overall site cleanup and initial activities would result in removal and remediation of potentially hazardous materials at the site. The project does not include the construction of septic tanks or alternative wastewater disposal systems. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

7.3 Hazards and Hazardous Materials

Impact 7.3-1: Is the overall site cleanup or initial activities located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, or within the vicinity of a private airstrip, and would the project result in a safety hazard for people residing or working in the project area?

The project site is located approximately 12 miles west from the closest public airport, the Van Nuys Airport. The Whiteman Airport, a general aviation airport, is approximately 16.5 miles east and the Burbank Airport is approximately 19.3 miles east of the project site. The Santa Paula Airport is approximately 22 miles to the northwest and the Camarillo Airport is approximately 22 miles to the southwest. Thus, the project site is not located within 2 miles of an existing public airport or public use airport, and is not located within an airport land use plan. The purpose of the overall site cleanup or initial activities is to clean up contaminated soil and groundwater at the project site. As such, implementation of the project would result in removal and remediation of potentially hazardous materials at the site. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

7.4 Hydrology and Water Quality

Impact 7.4-1: Would implementation of the overall site cleanup or initial cleanup activities place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

A significant impact to floodplain or floodplain management would occur if a project caused significant encroachment within a base floodplain, as defined by U.S. Department of Transportation Order 5650.2. According to the Flood Insurance Rate Map (FIRM) prepared by Federal Emergency Management Agency (FEMA), the project site is located in Zone X, which is an area determined to be outside of the 0.2 percent annual chance floodplain, or a 500-year floodplain (FEMA, 2016). The project does not include any development of housing within a 100-year flood zone area. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

Impact 7.4-2: Would implementation of the overall site cleanup or initial activities expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?

As described above, the project site is not located within a FIRM 100-year flood hazard area as mapped by FEMA. The project site is located on a hillside and is there are no levees or dams in the project vicinity. The Chatsworth Reservoir is located approximately 3.4 miles east of the project site; however, the elevation of this reservoir is lower than the project site. The purpose of

the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. Thus, the proposed project would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. There would be no impact and this criterion is not discussed further in this PEIR.

Impact 7.4-3: Would implementation of the overall site cleanup or initial activities result in inundation by seiche, tsunami, or mudflow?

The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. A seiche is an oscillation of a body of water in an enclosed or semi-enclosed basin, such as a reservoir, harbor, lake, or storage tank. A tsunami is a great sea wave, commonly referred to as a tidal wave, produced by a significant undersea disturbance such as tectonic displacement associated with large, shallow earthquakes. Mudflows are a form of landslides resulting from the downslope movement of soil and/or rock under the influence of gravity.

The project site is approximately 14.26 miles north of the Pacific Ocean. Thus, the project site is not located within Tsunami Inundation Hazard Areas on State or County hazard maps. While the project site is located approximately 3.4 miles west of the Chatsworth Reservoir, it is uphill from the reservoir. The sloped areas of the project site are largely composed of bedrock and would not be capable of generating mud in a rainstorm. Thus, it is not anticipated that mudflows would pose a threat to the project site. Excavation areas would be revegetated as needed to prevent erosion. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

Impact 7.4-4: Would the overall site cleanup or initial activities propose the use of groundwater in any capacity located within two miles of the boundary of a former or current test site for rocket engines?

This checklist question is from the Ventura County's Initial Study Assessment Guidelines and refers specifically to the SSFL site. As stated previously, the purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. Cleanup of the groundwater would require extracting impacted groundwater, treating it in the existing GETS, and pumping the treated water to surface water and/or into an injection well. The groundwater extracted as a part of the proposed project would not be used for water supply, however treated groundwater may be used for dust suppression during cleanup activities. Treated groundwater from the SSFL site may be used for dust suppression only and would not be used for any other purpose. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

Impact 7.4-5: Would the overall site cleanup or initial activities increase surface water demand, including but not limited to diversion or dewatering downstream reaches, resulting in an adverse impact to one or more of the beneficial uses listed in the Basin Plan.

None of the proposed project activities would require use of any surface water and, thus, would not increase surface water demand. Since the proposed project would not increase surface water demand, it would not result in an adverse impact to one or more of the beneficial uses listed in the Basin Plan. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

7.5 Land Use and Planning

Impact 7.5-1: Would implementation of the overall site cleanup or initial activities physically divide an established community?

The project site is composed of areas of open space, much of which is in an undisturbed natural condition, and developed areas that include roads, buildings, and other infrastructure associated with its past use as a scientific research and test facility. The SSFL site is not open to the public and is no longer used as a research facility. Existing activities that occur at the project site include ongoing investigation and monitoring of soil and groundwater contamination, demolition of some NASA's test stands, and operation of surface and groundwater treatment systems (see Sections 3.4.2.8 and 3.4.2.9 for descriptions of these systems). In addition, guided tours are conducted at the site by Boeing a couple of times each year, highlighting the site's historical uses and existing biological resources.

As explained in Section 3.6, *Overall Site Cleanup*, of this PEIR, the purpose of the proposed project is to clean up contaminated soil and groundwater at the project site. As such, implementation of the overall site cleanup and initial activities would result in removal and remediation of potentially hazardous materials at the site. Future development is not part of the proposed project and may be subject to other discretionary actions by the County of Ventura, or other government agencies (potentially including DTSC depending on the circumstance), including environmental review as appropriate pursuant to CEQA. Thus, it is not anticipated that the proposed project would physically divide, disrupt, or isolate an established community. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

7.6 Mineral Resources

Impact 7.6-1: Would implementation of the overall site cleanup or initial activities result in the loss of availability of a known mineral or petroleum resource that would be of value to the region and the residents of the state *or* the loss of availability of a locally important mineral resource recovery site or oil field delineated on a local general plan, specific plan, or other land use plan?

According to the California Department of Conservation, Mineral Land Classification Map, Calabasas Quadrangle, the project site is located within a designated Mineral Resource Zone 3 (MRZ-3), which is defined as an area containing mineral deposits for which the significance cannot be evaluated from available data (CDC, 1981). The County of Ventura 2005 General Plan EIR, also states that the project site is located within an MRZ-3 zone (County of Ventura, 2005). Implementation of the project would not result in the loss of availability of known mineral

resources that would be of value to the region and the residents of the state, nor would it result in the loss of availability of a locally important mineral resource recovery site. Therefore, there would be no impact to mineral resources and no mitigation measures are required. This topic is not discussed further in the PEIR.

7.7 Noise

Impact 7.7-1: For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, or for a private airstrip would the overall site cleanup or initial activities expose people residing or working in the project area to excessive noise levels?

The project site is located approximately 12 miles west from the closest public airport, the Van Nuys Airport. The Whiteman Airport, a general aviation airport, is approximately 16.5 miles east and the Burbank Airport is approximately 19.3 miles east of the project site. The Santa Paula Airport is approximately 22 miles to the northwest and the Camarillo Airport is approximately 22 miles to the southwest. Thus, the proposed project is not located within 2 miles of an existing public airport or public use airport, a private airstrip, and is not located within an airport land use plan. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

7.8 Population and Housing

Impact 7.8-1: Would implementation of the overall site cleanup or initial activities induce substantial population growth in an area, either by directly (for example, by proposing new homes and businesses) or indirectly (for example, though extension of roads or other infrastructure)?

As explained in Section 3.6, *Overall Site Cleanup*, of this PEIR, the purpose of the project is to clean up contaminated soil and groundwater at the project site. As such, implementation of the overall site cleanup and initial activities would result in removal and remediation of potentially hazardous materials at the site. Future development is not part of the project and is not evaluated in the PEIR. The 2010 AOCs and 2007 Consent Order only require cleanup of the site. Any future development of the site would be subject to other discretionary actions by the County of Ventura or other government agencies (which may include DTSC under certain circumstances), including environmental review as appropriate pursuant to CEQA. Thus, for the purpose of this analysis, the existing land use at the project site would not change. Therefore, the project would not result in population growth in the area as it does not include the construction of houses, businesses, or extension of roads. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

Impact 7.8-2: Would implementation of the overall site cleanup or initial activities displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere, or would implementation of the proposed project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

The project site has no existing residences and no housing. The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. Thus, no residential units would be removed to implement the project, and the project would not displace any existing housing units or people, nor necessitate the construction of replacement housing elsewhere. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

7.9 Public Services

Impact 7.9-1: Would implementation of the overall site cleanup or initial activities result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services?

- Fire Protection
- Police Protection
- Schools
- Parks
- Other Public Facilities (such as libraries)

The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. Thus, the proposed project would not result in population growth in the area requiring the construction of new government facilities such as those associated with fire and police protection, schools, parks, or other facilities, such as libraries. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

7.10 Recreation

Impact 7.10-1: Would implementation of the overall site cleanup or initial activities increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. Thus, the proposed project would not result in an increase in population and would not substantially increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

Cleanup activities would be visible to visitors to Sage Ranch Park, and visitors would also be exposed to increased noise levels. However, implementation of mitigation measures would reduce these impacts to less than significant. Please see Section 4.1, *Aesthetics*, and Section 4.10, *Noise*, of this PEIR for a detailed discussion of these impacts and mitigation measures.

Impact 7.10-2: Do the overall site cleanup or initial activities include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters—which does not include recreational facilities. The project would not result in an increase in population and would not require the construction or expansion of recreational facilities. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

7.11 Transportation/Traffic

Impact 7.11-1: Would implementation of the overall site cleanup or initial activities conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

LOS standards established by jurisdictions/agencies are intended to regulate permanent traffic increases associated with new development and do not apply to traffic increases that occur during cleanup activities. As discussed in Section 4.11.4, once cleanup activities end, the trip generation from the project site would be reduced to negligible levels, with some potential maintenance activities remaining at the site. Because post-project remediation activities would not result in permanent (ongoing) impacts related to traffic and congestion, no impact related to conflicts with the applicable congestion management program or LOS standards would occur, and this criterion is not discussed further in this PEIR.

Impact 7.11-2: Would implementation of the overall site cleanup or initial activities result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

The project site does not include nor does it propose to add airport facilities. Therefore, there would be no impact, and this criterion is not discussed further in this PEIR.

Impact 7.11-3: Would implementation of the overall site cleanup or initial activities conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

The overall site cleanup or initial activities would not directly or indirectly eliminate alternative transportation corridors or facilities (e.g., bicycle lanes, bus routes/stops). In addition, the project would not include changes in policies or programs that support modes of alternative transportation. Therefore, the project would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, and this criterion is not discussed further in this PEIR. The temporary effects on the performance and safety of bicycle and pedestrian facilities are discussed under Impacts 4.11-2a and 4.11-2b in Section 4.11, *Transportation and Traffic*, of this PEIR.

7.12 Utilities and Service Systems

Impact 7.12-1: Would implementation of the overall site cleanup or initial activities exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

The Los Angeles Regional Water Quality Control Board (LARWQCB) implements programs to protect all waters in the coastal watersheds for Los Angeles and Ventura counties. The LARWQCB's Water Quality Control Plan for the Los Angeles Region (the Basin Plan) establishes guidelines for all municipalities and other entities within Los Angeles and Ventura counties that use water and/or discharge into the Santa Monica Bay. Wastewater reclamation and treatment is currently conducted onsite in accordance with the treatment requirements of the LARWQCB and/or water reclamation requirements of the Basin Plan.

As discussed in Section 3.4.2.6, *Sewer Pipelines and Leach Fields*, of this PEIR, SSFL currently has an onsite integrated sewer system, which replaced septic tanks and a number of leach fields in 1961. The proposed project would remove the inactive integrated sewer system. Wastewater would not be generated at the project site during cleanup activities as portable toilets/bathrooms would be used for personal sanitation. While the proposed project would generate minimal wastewater onsite during cleanup activities, this wastewater would not be treated onsite and would not exceed wastewater treatment requirements of the LARWQCB. Furthermore, following completion of cleanup activities, there would be no wastewater generated onsite and, thus, the proposed project would not contribute wastewater that would be treated. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

Impact 7.12-2: Would implementation of the overall site cleanup or initial activities require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

A significant impact may occur if a project would increase water consumption or wastewater generation to such a degree that the capacity of facilities currently serving the project site would be exceeded. Water service to the project site is currently supplied by Calleguas Municipal Water District to the water supply tank north of the entrance to the site, which is used for domestic water use and fire suppression. The 10 aboveground storage tanks located onsite along Skyline Drive had not been used since site operations ceased and are in the process of being removed. As

described above, the project site is currently served by an onsite integrated sewer system. There are various buildings, features, and inactive test stands which currently exist on the project site. There is existing infrastructure in place including a water service system and wastewater conveyance system.

Existing water supply lines provide water directly to the various existing buildings, and this water is used for sanitation, fire suppression, and dust control purposes. Onsite personnel use water dispensers for drinking water. Although there are existing water supply wells onsite, these are not used to supply water on the project site. Wastewater that is generated at the project site is conveyed via the existing wastewater conveyance system to an existing sewage treatment plant where it is treated. There were three sewage treatment plants onsite: the Area I Sewage Treatment Plant (STP-1), the Area II STP (STP-2), and the Area III STP (STP-3). STP-2 and STP-3 have been removed and sewage Area I sewage service is diverted to STP-1, where it is stored in a subsurface concrete container prior to transport offsite for disposal. STP-1 would be removed and/or decommissioned as a part of the proposed project. Water service to the project site would continue to be provided by the Calleguas Municipal Water District during the site cleanup activities.

The overall project would require a total of 78,500,294 gallons of water over the total duration of cleanup activities. Proposed water use during cleanup would be attributed dust control and excavation. This use would be above existing water use. Water used for potential fire suppression would be the same as existing conditions. Soil cleanup activities are expected to last approximately 15 years, and thus would be temporary in nature. Irrigation water used for plant restoration would occur over 6 months starting from the date of planting. It is estimated that plant irrigation would use up to a total of 190,100 gallons of water. Upon completion of cleanup activities and plant irrigation water service would be discontinued. Given the temporary nature of the cleanup activities, overall site cleanup or initial activities would not result in the need for construction of new water treatment facilities or expansion of existing facilities.

Dewatered sediment produced by cleanup activities would be hauled to an offsite disposal facility. The supernatant (separated water) from the dewatering system may be treated onsite or disposed offsite. If treated onsite, the supernatant would be trucked to the existing stormwater treatment systems in Area I or Area III before discharge as regulated by the stormwater NPDES program. If not treated at an onsite stormwater treatment system, the supernatant would be placed in labeled USDOT-approved containers for transport to the above-listed disposal facilities, or potentially sent for treatment at Southwest Treatment Systems, Inc., in Vernon, California. Based on the limited amount of supernatant produced, it is not expected that dewatering activates would result in the need for construction of new wastewater treatment facilities or expansion of existing facilities. As described above, the project site is currently developed and is served by an existing integrated sewer system. Wastewater generated during overall site cleanup and initial activities would be conveyed to the existing sewer system or treated onsite. If treated onsite, the treated wastewater would be trucked to the existing stormwater treatment systems in Area I or Area III before discharge as regulated by the stormwater NPDES program. Wastewater would continue to be treated onsite and, thus, would not result in the need for construction of new wastewater

treatment facilities or expansion of existing facilities. Thus, impacts would be less than significant and this criterion is not discussed further in this PEIR.

Impact 7.12-3: Would implementation of the overall site cleanup or initial activities require the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

As described in Section 3.4.2.9, *Existing Surface Water Treatment Systems*, both active and passive methods for treating surface water are used at SSFL to meet NPDES permit requirements. Surface water is currently collected in onsite ponds using two surface water treatment systems that employ filters and chemical treatment. A passive biofilter treatment system has been implemented that uses soil, naturally occurring bacteria, and native plants to filter the surface water. The RPs have also implemented drainage culvert modifications, stream bank stabilization, revegetation of disturbed soil areas, installation of detention bioswales, and placement of smaller-scale erosion control measures to comply with NPDES requirements. These stormwater drainage facilities would continue to be used during overall site cleanup or initial activities and no new facilities would be constructed as a part of the project. Project-related earth moving activities would result in recontouring to mimic natural topography and drainage patterns throughout the site. Furthermore, the proposed project would not increase impervious surfaces on the project site and, thus, the generation of stormwater is not expected to increase. As such, implementation of the proposed project would not require the construction of new stormwater facilities or the expansion of existing facilities and there would be no impact. This criterion is not discussed further in this PEIR.

Impact 7.12-4: Would implementation of the overall site cleanup or initial activities have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

As described above, water for the project site is provided by the Calleguas Municipal Water District to the water supply tank north of the entrance to the site. In addition, there are former water supply wells located within the project site, but these wells are not used for water supply. Water use during overall site cleanup and initial activities would include dust suppression. This use would be above existing water use. Cleanup activities are expected to last approximately 15 years, and thus would be temporary in nature. Upon completion of cleanup activities, water service would be terminated. Given the temporary nature of the cleanup activities and the reduced water use at the project site, it is anticipated that current water supplies would be sufficient to serve the project site. Furthermore, with continued decommissioning of the site, water use would continue to decrease. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

Impact 7.12-5: Would implementation of the overall site cleanup or initial activities result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. As described above, wastewater is treated onsite and would decrease with implementation of the proposed project. The proposed project does not and would not use outside wastewater treatment providers. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

Impact 7.12-6: Would implementation of the overall site cleanup or initial activities result in a determination by the communication provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to improve the quality of surface waters, groundwater, and downstream receiving waters. Thus, the project would not include any development onsite, which could result in an increase in population and, subsequently, increase demand from communication providers. Therefore, there would be no impact and this criterion is not discussed further in this PEIR.

CHAPTER 8
Other CEQA Considerations

This chapter presents the evaluation of other types of environmental impacts required by the CEQA that are not covered within the other chapters of this PEIR. This includes significant unavoidable environmental impacts; significant irreversible impacts; growth-inducing impacts; potential secondary effects; and reasons why the project is being proposed, notwithstanding significant unavoidable impacts.

8.1 Significant Unavoidable Environmental Impacts

Section 15126.2(b) of the CEQA Guidelines requires that an EIR describe any significant environmental impacts that cannot be avoided, including those effects that can be mitigated but not reduced to a less than significant level. **Table 8-1** presents a summary of the program and project-level impacts that were concluded to be significant and unavoidable. These impacts are also described in detail in Chapter 4.0, *Environmental Setting, Impacts and Mitigation*, of this PEIR.

Table 8-1
Summary of Significant and Unavoidable Impacts of the Project

Resources	Project Impacts	Cumulative Impacts
Air Quality	Project activities would generate emissions primarily through the use of heavy-duty construction equipment and vehicle trips generated from soil haul trucks and workers traveling to and from the project site. Project emissions would conflict with the VCAPCD's and SCAQMD's air quality management plan's (AQMPs) in that it results in a violation of NO_X, emissions thresholds in the South Central Coast Air Basin (SCCAB) and could contribute to existing and projected air quality violations with respect to ozone and NO_2. Compliance with applicable regulations, and incorporation of mitigation measures would reduce emissions, but impacts would remain significant and unavoidable.	The project's incremental contribution to cumulative air quality impacts is determined based on compliance with the AQMPs. The proposed project would conflict with the VCAPCD's AQMP's reduction strategies in that the project level emissions would exceed the regulatory thresholds for NOX within each of the air basins. Even with the implementation of mitigation, project emissions would not be reduced to below VCAPCD's thresholds. Project emissions exceed the thresholds and therefore have the potential to result in daily exceedances within the SCCAB. Thus, given the project's inconsistency with the VCAPCD's AQMP, the project, in combination with related projects, could contribute considerably to air quality within the VCAB and cumulative impacts to air quality within the VCAB could be cumulatively considerable (significant and unavoidable).

Resources	Project Impacts	Cumulative Impacts
Biological Resources	Project activities include soil sampling, grading, soil excavation and removal, building demolition and removal, groundwater monitoring and treatment, road improvements, and installation and decommissioning of wells, pipes, and infrastructure. Such activities could result in significant impacts to biological resources, including disturbance or removal of sensitive habitats (e.g., oak woodlands); removing or damaging special-status plants (i.e., Braunton's milk-vetch) or protected trees; injuring, killing, harassing, or otherwise harming special-status wildlife, including western spadefoot toad, coast horned lizard, and nesting birds and raptors; and potential effects to wildlife movement and/or a wildlife movement corridor. Mitigation measures would minimize impacts to biological resources to the extent feasible; however, if an AOC exception is not applied, impacts to Braunton's milk-vetch, Braunton's milk-vetch designated critical habitat, and Santa Susana tarplant would be significant and unavoidable.	The proposed project would have potentially significant impacts, including disturbance or removal of sensitive habitats (e.g., oak woodlands); removing or damaging special-status plants (i.e., Braunton's milk-vetch) or protected trees; injuring, killing, harassing, or otherwise harming special-status wildlife, including western spadefoot toad, coast horned lizard, and nesting birds and raptors; and potential effects to wildlife movement and/or a wildlife movement corridor. Mitigation measures have been identified for the proposed project to avoid and/or minimize impacts to biological resources. However, known occurrences of Braunton's milk-vetch and Santa Susana tarplant have been recorded within the vicinity of a few cumulative projects and could be removed or otherwise impacted. Therefore, when considered in addition to the anticipated impacts of other projects in the cumulative scenario, the project's incremental contribution to impacts to biological resources could be cumulatively considerable (significant and unavoidable).
Cultural Resources	The project would result in direct and indirect impacts to archaeological sites qualifying as historical resources or unique archaeological resources through the destruction or alteration of the historical setting as a result of the massive amount of soil removal that would permanently affect the appearance of the surrounding area. Indirect impacts would result from disturbances to resources caused by erosion or by an increased number of vehicles and personnel at the site, which expose or damage archaeological resources. Additionally, project excavation would also result in the destruction or alteration of contributing elements which convey the significance of the SSFL TCP (e.g., alteration or destruction of prehistoric archaeological sites and isolates, alteration of the natural landscape surrounding important archaeological resources and rock art sites, and the alteration of natural habitat affecting plant and animal communities associated with the SSFL TCP and would constitute a profound impact to some Native American tribes whose culture, history, and identity is significantly tied to the area). Incorporation of mitigation measures would reduce impacts to archaeological resources and tribal cultural resources, but impacts would remain significant and unavoidable.	Multiple related projects are proposed throughout the Simi Hills and many of the cultural resources within the geographic scope have already been subjected to impacts as a result of past projects. Projects undertaken before environmental laws were in place may not have considered, or mitigated, significant impacts to cultural resources, and may have resulted in damage to important cultural resources, including resources that retain significant cultural value to Native American groups. Projects that have already been implemented or may occur in the foreseeable future could impact cultural resources and bring additional people (e.g., work crews, residents, tourists) into the area, resulting in increased probability of vandalism or off-highway vehicle use that may impact resources or result in visual, auditory, and other environmental impacts that may adversely affect the SSFL TCP. Therefore, impacts of the project would combine with impacts from past, present, and reasonably foreseeable projects, and the project's contribution toward cumulative effects on cultural resources would be cumulatively considerable (significant and unavoidable).
Hazards and Hazardous Materials	When considering the potential risk of upset impacts for 15-year duration of the project, a collision involving a truck transporting hazardous material resulting in a release could potentially occur several times even with the implementation of feasible mitigation measures, resulting in a significant and unavoidable impact. The proposed project would also result in a significant and unavoidable impact with respect to being located on a contaminated site with the potential to create significant hazard to the public.	The proposed project, in combination with related projects, could potentially result in reasonably foreseeable upset and accident conditions involving the release of hazardous materials. Furthermore, the proposed project is considered a contaminated site per DTSC and CalEPA. Therefore, impacts related to hazards and hazardous materials would be cumulatively considerable (significant and unavoidable).

Resources	Project Impacts	Cumulative Impacts
Land Use	The project would conflict with applicable land use goals, policies, and regulations related to air quality and biological resources. Specifically, the project would remove native vegetation and soil, adversely affecting sensitive/special status plants, wildlife, and habitat.	Development of the related projects in areas designated Open Space (OS) by the Ventura County General Plan would result in an overall reduction of open space, which would conflict with the established goal of retaining open space lands in a relatively undeveloped state. Development of open space also has the potential to conflict with other General Plan policies such as policies to protect air quality and biological resources. Given that cumulative projects would combine to reduce the overall amount of open space in Ventura County, there would be conflicts with the General Plan policies intended to protect open space, and biological resources. Even with implementation of mitigation measures, the proposed project would have a significant and unavoidable impact on land use because it would conflict with the policies of the Ventura County General Plan, and would therefore cumulatively contribute to General Plan land use conflicts on OS-designated lands. Therefore, the project in combination with related projects would contribute considerably to cumulative land use impacts (significant and unavoidable).
Noise	Project activity noise would result in a substantial increase in noise levels at the Sage Ranch Park ranger's house and campsites during cleanup activities. The project would also result in a substantial increase in traffic offsite noise levels at the roadway segments of Facility Road at Woolsey Canyon Road and Woolsey Canyon Road between Valley Circle Boulevard and Knapp Ranch Road during peak construction days when a daily maximum of 96 round trips would occur. This would result in a significant impact. Implementation of mitigation measures would minimize noise levels through the installation of noise barriers; however, because construction of noise barriers of this scale for the entire 15-year duration of the project may not be feasible, practical, or acceptable to the noise-sensitive users in certain locations, impacts relating to temporary/ periodic or substantial increases in ambient noise levels would be considered significant and unavoidable.	Cumulative mobile source noise impacts would occur primarily as a result of increased traffic on the local roadways due to the project and cumulative projects within the project's traffic study area. Cumulative development along with the project would increase the peak hour traffic noise levels by a maximum of 7.8 dBA, on the roadway segments of Woolsey Canyon Road, between Valley Circle Boulevard and Knapp Ranch Road and Facility Road at Woolsey Canyon Road, while all of the other study roadway segments would experience an increase in peak hour traffic noise levels of less than 3 or 5 dBA over existing conditions. As the roadway segments of Woolsey Canyon Road between Valley Circle Boulevard and Knapp Ranch Road and Facility Road at Woolsey Canyon Road would experience more than a 5 dBA increase in peak hour traffic noise levels, the cumulative traffic noise impacts on this roadway segment would be cumulatively significant. Mitigation measures would reduce noise levels but the impact would remain significant and unavoidable. Therefore, the project, in combination with related projects, would contribute considerably to cumulative noise impacts (significant and unavoidable).
Transportation and Traffic	The addition of project-related traffic (up to 250 worker trips and 96 truck trips) to the local roadway network would result in 10 intersections and five roadway segments operating at level of service E or F, resulting in a significant and unavoidable impact.	Although the project's contribution to potential cumulative impacts would be temporary and would cease upon completion of site cleanup activities, the addition of project-related traffic to the local roadway network would be cumulatively considerable. Therefore, when considered in addition to the anticipated impacts of other projects in the cumulative scenario, the proposed project's incremental contribution to transportation and traffic impacts would be cumulatively considerable (significant and unavoidable).

8.2 Significant Irreversible Impacts

Sections 15126(c) and 15126.2(c) of the CEQA Guidelines, requires that an EIR address any significant irreversible environmental changes that would occur should the project be implemented. Resources irreversibly or irretrievably committed to a proposed action are those used on a long-term or permanent basis. This This includes the use of nonrenewable resources such as metal, wood, fuel, paper, aggregate and other natural resources. These resources are considered irretrievable in that they would be used for a proposed action when they could have been conserved or used for other purposes. Another irreversible or irretrievable commitment of resources is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment. As stated in CEQA Guidelines Section 15126.2(c):

> *Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter likely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.*

Both program and project elements would consume limited, slowly renewable and non-renewable resources that are not replenishable or which may renew so slowly as to be considered non-renewable. This consumption would occur during cleanup activities at the project site. Cleanup activities would require a commitment of resources that would include: (1) fuel associated with the use of equipment; (2) the transportation of goods and people to and from the properties; and (3) the import and export of impacted and clean backfill soil. Specific non-renewable resources used during the cleanup process could include: (1) clean fill to be used as backfill; (2) metals such as steel, copper, and lead; (3) petrochemical construction materials such as plastics; and (4) water. Fossil fuels such as gasoline and oil would also be consumed in the use of construction vehicles and equipment, as well as the transportation of goods and people to and from the project site and the hauling of impacted and clean soil from and to the project site, respectively.

In summary, implementation of the cleanup would result in the irretrievable commitment of limited, slowly renewable, and nonrenewable resources, on both a programmatic and project level, which would incrementally limit the availability of these particular resource quantities for future generations or for other uses during the life of the project. However, continued use of such resources would be on a relatively small scale and such changes would not be considered significant.

8.3 Growth Inducing Impact

Section 15126.2(d) of the CEQA Guidelines requires agencies to address potential growth inducing effects of EIR actions. Growth-inducing effects are defined as those effects that could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. A project can be determined to have a growth-inducing impact if it directly or indirectly causes economic or population expansion through the removal of obstacles to growth or encourages or facilitates other activities that could significantly affect the environment; actions that are sometimes referred to as "growth accommodating."

As explained in Section 3.6, *Overall Site Cleanup*, of this PEIR, the purpose of the proposed project is to clean up contaminated soil and groundwater at the project site. As such, implementation of the proposed project would result in removal and cleanup of potentially hazardous materials at the site. Implementation of the project would be completed in approximately 15 years by a workforce of as many as 250 employees. It is anticipated that all workers would commute to the project site from within the project area and from surrounding cities. Therefore, implementation of the project would not result in the creation of new residences on or adjacent to the project site. Moreover, the proposed project would not alter the land uses within the project site. No new residential land uses or infrastructure beyond what currently exists is included in the project. Future development is not part of the project and is not evaluated in the PEIR. The 2010 AOCs and 2007 Consent Order only require cleanup of the site. Any future development of the site would be subject to other discretionary actions by the County of Ventura or other government agencies (which may include DTSC under certain circumstances), including environmental review as appropriate pursuant to CEQA. Therefore, the project would not induce direct or indirect population growth in the area as it does not include the construction of houses, businesses, or extension of roads. Accordingly, the project would not result in growth inducing impacts.

8.4 Potential Secondary Effects

Section 15126.4(a)(1)(D) of the CEQA Guidelines requires mitigation measures to be discussed in less detail than the significant effects of the project if the mitigation measure(s) would cause one or more significant effects in addition to those that would be caused by the project as proposed. With regard to this section of the CEQA Guidelines, the project's proposed mitigation measures that could cause potential impacts were evaluated. The following provides a discussion of the potential secondary effects that could occur as a result of the implementation of the project mitigation measures, listed by environmental issue area. Only those PEIR sections that contain mitigation measures specific to that environmental resource area are addressed.

8.4.1 Air Quality

Mitigation Measures AQ-1 through AQ-6 establish methods to monitor and reduce emissions and dust generation, such as requiring use of construction equipment that meets applicable emissions standards, using water for dust suppression, covering soil stockpiles with tarps, and limiting equipment and vehicle idling times. Any additional vehicle trips and activities associated with

monitoring or delivering equipment to the site would not result in substantial air emissions or generation of dust. Water supply for dust suppression was evaluated in Chapter 7.0, *Impacts Found not to be Significant*, of this PEIR and was determined to result in a less than significant impact. Mitigation Measures AQ-1 through AQ-6 would not cause additional traffic or emissions impacts, or result in physical impacts not addressed in the PEIR. The mitigation measures would require no construction for their implementation, and would not be expected to result in adverse secondary impacts on the environment.

8.4.2 Biological Resources

Mitigation Measures BIO-1 through BIO-23 establish protections for biological resources through avoidance, preconstruction surveys, wildlife monitoring, and implementation of revegetation, conservation or mitigation plans. Any additional vehicle trips and activities associated with biological resource surveys would not result in substantial use of resources, cause additional traffic or emissions impacts, or result in physical impacts not addressed in the PEIR. The mitigation measures assure that biological resources would be treated consistent with CEQA Guidelines and regulatory provisions for the protection of resources. They would require no construction for their implementation, and would not be expected to result in adverse secondary impacts on the environment.

8.4.3 Cultural Resources

Mitigation Measures CUL-1 through CUL-16 and CUL-18 would avoid, minimize, rectify, reduce or compensate for impacts to archaeological resources, tribal cultural resources, and human remains through the implementation of protections, documentation, treatment, and preservation. Mitigation Measure CUL-17 would reduce impacts to paleontological resources through identification, documentation, and treatment. The mitigation measures assure that cultural and paleontological resources would be treated consistent with the CEQA Guidelines and regulatory provisions for the protection of such resources and would be carried out by qualified professionals and in coordination with Tribes, as specified by the measures. The measures identified do not require construction or other earth disturbing activities beyond those associated with testing and recovery of archaeological resources, paleontological resources, and human remains as prescribed by the regulatory framework and would not otherwise expose the resources to damaging or destructive effects. Therefore, cultural and paleontological resources mitigation measures are not anticipated to have secondary impacts on the environment.

8.4.4 Geology and Soils

Mitigation Measure GEO-1 requires a geotechnical evaluation. The geotechnical evaluation may involve a small amount of land disturbance for testing that involves the use of test pits, trenching, and/or boring. The potential land disturbance associated with geotechnical testing is included as part of the total prosed land disturbance evaluated for the proposed project. Therefore, Mitigation Measure GEO-1 would not result in a significant secondary impact.

8.4.5 Greenhouse Gas Emissions

Mitigation Measures GHG-1 through GHG-3 establish methods to reduce GHG emissions, such as requiring onsite recycling of materials and debris; using vehicle fleets to meet or exceed 2014 emissions standards; and reducing emissions through offsite planting of vegetation, or purchase of carbon credits. These measures would not substantially change the amount of equipment, number of trucks, or the location or duration of use of equipment, and would not cause additional traffic or emissions impacts, or result in physical impacts not addressed in the PEIR. The mitigation measures would require no construction for their implementation, and would not be expected to result in adverse secondary impacts on the environment.

8.4.6 Hazards and Hazardous Materials

Mitigation Measure HAZ-1 requires a Health and Safety Plan; Mitigation Measure HAZ-3 requires a Hazardous Materials Business Plan, and Mitigation Measure HAZ-4 requires a Fire Management Plan. Implementation of these plans would involve establishment of protocols and practices as well as storage of emergency response equipment and materials. Implementation of these plans would require no construction and would not be expected to result in adverse secondary impacts on the environment. Mitigation Measure HAZ-2 provides required specifications for containment of excavated materials that exceed state or federal hazardous waste criteria, and would not involve any activities that could result in significant secondary impacts.

8.4.7 Hydrology and Water Quality

Mitigation Measure HYDRO-1 requires a Stormwater Pollution Prevention Plan (SWPPP). The preparation and implementation of the SWPPP would not involve activities that could result in significant secondary impacts. Mitigation Measure HYDRO-2 requires an Operations and Maintenance Plan that involves monitoring and sampling of wells. New monitoring wells would be constructed in accordance with the California DWR Well Standards Bulletin 74-90, Ventura County Well Ordinance 4184, and the 2014 DTSC Well Design and Construction for Monitoring Groundwater at Contaminated Sites. The installation if new monitoring wells also has the potential to require a Section 404 Clean Water Act permit, Section 401 Water Quality Control permit, and CDFW streambed alteration agreement. Obtainment of all applicable water quality and construction permits/agreements would ensure that Mitigation Measure HYDRO-2 would not result in a significant secondary impact.

8.4.8 Noise

Mitigation Measure NOISE-1 limits the time period noise-generating cleanup activities can take place within 1,000 feet of the northern boundary of Area 1. This measure would not implement any activities that could result in a significant secondary impact. Mitigation Measures NOISE-2 and NOISE-3 would result in temporary installation of noise barriers. The noise barriers may result in adverse visual impacts. However, the use of the noise barriers would be temporary and would, therefore, not result in a significant secondary impact.

8.4.9 Transportation and Traffic

Mitigation Measures TRANS-1 and TRANS-2 identify procedures to be followed during project implementation to minimize or avoid transportation and traffic impacts. They would reduce traffic impacts on roadways and at intersections, control the movement of remediation-generated traffic, and repair damage to public roadways. As such, these measures would reduce project impacts, and would lessen off-site impacts. Mitigation Measure TRANS-1 requires implementation of a site-wide traffic management plan, which identifies common traffic-control requirements for onsite deliveries and offsite hauling to facilitate safe and efficient traffic flow within SSFL and on public roadways. As such, this measure would reduce project impacts, without requiring physical improvements. Mitigation Measure TRANS-2 requires restoration of all public roads, easements, ROWs and infrastructure (such as signs, utility poles, etc.) within the public road ROWs that have been damaged from project-related activities or traffic through implementation of a Road Restoration Plan. These improvements would not require more than minor construction work, which would result in minimal emission and noise related to repair activities. For these reasons, implementation of Mitigation Measures TRANS-1 and TRANS-2 would not result in significant secondary impacts.

8.4.10 Energy Consumption

Mitigation Measure EC-1 requires implementation of an energy conservation plan, which involves such activities as installation of Energy Star rated double-paned windows, white reflective roofing or covering, and use of LED light bulbs on all temporary office buildings, none of which have the potential to result in an adverse physical effect to the environment. Therefore, implementation of Mitigation Measure EC-1 would not result in significant secondary impacts to Energy Consumption.

8.5 Reasons Why the Project is Being Proposed, notwithstanding Significant Unavoidable Impacts

In addition to identification of the project's significant unavoidable impacts, Section 15126.2(b) of the CEQA Guidelines also requires a description of the reasons why the project is being proposed, notwithstanding significant unavoidable impacts associated with the project. The project would incorporate mitigation measures that would serve to minimize environmental impacts that could occur as a result of project implementation but would still result in significant and unavoidable impacts to air quality, biology, cultural resources, hazards and hazardous materials, land use, and noise. The reasons why the project is being proposed, notwithstanding the potentially significant and unavoidable impacts identified in Chapter 4.0, *Environmental Setting, Impacts and Mitigation*, of this PEIR, are tied to the purpose and objectives of the project. The primary objective of the proposed project is to implement SSFL cleanup under the 2007 Consent Order and the 2010 AOCs. As part of implementing the Orders, under Health & Safety Code 6.8, Section 25356.1, DTSC is required to base any decision on the USEPA National Contingency Plan and associated USEPA guidance documents to implement the 2007 Consent Order and the 2010 AOCs.

The following DTSC overall project objectives are based on the National Contingency Plan (40 CFR 300.430 (e)(9)) criteria:

1. Protect human health and the environment, attain soil and groundwater cleanup standards, and control of source(s) of releases. This can be done by ensuring exposure pathways are controlled, eliminated, or reduced through treatment, engineering controls, or institutional controls.
2. The cleanup for soil and groundwater must comply with applicable, relevant and appropriate laws, regulations and requirements.

To aid the decision making bodies in their review of the project and the environmental impacts and alternatives to the cleanup, the following criteria are assessed and considered:

3. Long-term effectiveness and reliability (after remedial activities are complete) in protecting human health and the environment (inclusive of surrounding communities) from exposure to materials containing contaminants above applicable cleanup requirements.
4. Reduction of toxicity, mobility, and/or volume of contaminated media.
5. Short-term effectiveness (during implementation/construction activities) in protecting human health and the environment (inclusive of surrounding communities) from exposure to materials with contaminants above applicable cleanup requirements.
6. Ability to implement the remedial activities, including feasibility to construct and operate, administrative feasibility and availability of services and materials.
7. Remediate the site in an expedient and cost-effective manner.
8. Community input during a formal public comment period on the cleanup decision document.

The following are some SSFL-specific elements of the above criteria:

9. Prevent or minimize migration of contaminants to offsite areas.
10. Implement the proposed project in a manner that is compatible with Ventura County's designation of the property.
11. Recognize the unique biological and cultural significance of the project site through protection of resources to the extent practicable and consistent with applicable laws and regulations for such resources.
12. Use in situ methods to the extent practicable, in order to minimize physical impacts to the environment.

Chapter 6.0, *Alternatives*, of this PEIR, discusses the selection of alternatives and provides a comparison of the alternatives relative to the project's potential environmental impacts, as well as the ability of each to meet the project objectives.

Alternative 1, the No Project Alternative, represents a continuation of the existing conditions at the project site and no removal or treatment of soil and some treatment of groundwater. Alternative 1 would avoid the project's significant and unavoidable impacts to air quality, biology, cultural resources, hazards and hazardous materials, land use, and noise. However, the No Project Alternative would not meet most of the project objectives, including the primary

objectives to clean up soil and groundwater contaminants consistent with applicable cleanup requirements.

Alternative 2, the Preliminary Estimated AOC Exceptions Alternative, would implement exceptions to the cleanup standards established in the AOCs for areas that contain Native American artifacts recognized as cultural resources and significant biological resources. Alternative 2 clean up would prevent or minimize the migration of contaminated media to offsite areas, though the AOC exception sites would not be cleaned up and the associated contaminates at those sites would remain. This alternative would also use in situ cleanup methods, to the extent practicable, to minimize physical impacts to the environment, and would remediate the site in an expedient and cost-effective manner. Alternative 2 would meet the objective of recognizing the unique biological and cultural significance of the project site by ensuring that the AOC exception sites are left undisturbed. This alternative would be compatible with Ventura County's designation of the property, but like the proposed project, this alternative would be inconsistent with the Ventura County General Plan.

Alternative 3, Reduced Truck Trip Scenario, would limit the maximum number of haul truck trips to 48 round trips per day, which is half of the daily maximum defined for the project. In this regard, Alternative 3 would significantly reduce air pollutant emissions, greenhouse gas emissions, traffic, and traffic noise. However, significant and unavoidable impacts to cultural and biological resources, hazards and hazardous materials, and land use would remain the same as, or be similar to those identified for the project. Alternative 3 would meet most of the project objectives, including cleanup of soil and groundwater contaminants, though it would not meet the objective to remediate the site in an expedient and cost-effective manner because it would extend the cleanup schedule 6 years beyond the 15-year proposed project schedule. Cleanup activities under Alternative 3 would prevent or minimize the migration of contaminated media to offsite areas, use in situ cleanup methods, to the extent practicable, to minimize physical impacts to the environment, but may not accomplish the objective to remediate the site in an expedient and cost-effective manner. When compared to the proposed project, Alternative 3 would comply with the objective of recognizing the unique biological and cultural significance of the project site through protection of resources to the extent practicable and consistent with applicable laws and regulations for such resources. This alternative would be compatible with Ventura County's designation of the property, but like the proposed project, this alternative would be inconsistent with the Ventura County General Plan.

Alternative 4, includes two alternative transportation options: Alternative 4a, Edison Road Overland Conveyor Route, and Alternative 4b, North American Cutoff Road Overland Conveyor Route. Alternative 4a consists of constructing an overland conveyor along Edison Road that would transport soil from the west side of the project site to a truck site where soil and debris would be loaded into haul truck for offsite disposal. Alternative 4a would meet all of the project objectives, including cleanup of soil and groundwater contaminants. Cleanup activities under Alternative 4a would prevent or minimize the migration of contaminated media to offsite areas. This alternative would also use in situ cleanup methods, to the extent practicable, to minimize physical impacts to the environment, but would not accomplish the objective to remediate the site

in an expedient and cost-effective manner. This alternative would cost approximately $80 million to develop and $461 million to operate, compared to $444 million to operate the proposed project (see Section 4.1.6 in Appendix J of this PEIR for details). When compared to the proposed project, Alternative 4a would result in additional impacts to biological and cultural resources; and increased costs. This alternative would be compatible with Ventura County's designation of the property, but like the proposed project, this alternative would be inconsistent with the Ventura County General Plan.

Alternative 4b consists of constructing an overland conveyor along North American Cutoff Road that would transport soil from the north side of the project site to a rail site where soil and debris would be loaded into freight trains for offsite disposal. Alternative 4b would meet all of the project objectives, including cleanup of soil and groundwater contaminants. Cleanup activities under Alternative 4b would prevent or minimize the migration of contaminated media to offsite areas. This alternative would also use in situ cleanup methods, to the extent practicable, to minimize physical impacts to the environment, but may not accomplish the objective to remediate the site in an expedient and cost-effective manner. This alternative would cost approximately $86 million to develop and $670 million to operate, compared to $444 million to operate the proposed project (see Section 4.1.6 of Appendix J for details). When compared to the proposed project, Alternative 4b would result in additional impacts to biological and cultural resources; and increased costs. This alternative would be compatible with Ventura County's designation of the property, but like the proposed project, this alternative would be inconsistent with the Ventura County General Plan.

A comparative evaluation of the alternatives indicates that Alternative 2, the AOC Exception Alternative, (which is the Reduced Intensity Alternative as defined in CEQA Guidelines Section 15126.6(e)), would have fewer impacts than the proposed project and other alternatives selected for analysis and meets all project cleanup objectives. Therefore, the Reduced Intensity Alternative is identified as the "environmentally superior alternative. However, as stated in Section 2.1.1, Combined Program- and Project- Level Analysis, of this PEIR, the remediation methods and technologies and corrective actions proposed are based on available investigation and characterization documents that have been prepared to date. After completion of the investigation and characterization documents and treatability studies, DTSC will select and approve the cleanup decision document for implementation. Once the cleanup decision documents have been approved, DTSC, along with the appropriate resource agencies, will determine where and if the AOC exceptions can be applied. Therefore, while the project would result in significant and unavoidable impacts to air quality, biology, cultural resources, hazards and hazardous materials, land use, and noise, an alternative has not been identified that would avoid these impacts and comply with project objectives in an expedient and cost-effective manner. Thus, the project would provide a balance between the environmental impacts that would occur with the implementation of the project and meeting the objectives developed for the project in an expedient and cost-effective manner.

CHAPTER 9
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CHAPTER 10
Acronyms

AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
ACHP	Advisory Council on Historic Preservation
ACI	Archaeological Consultants, Inc.
ACMs	asbestos-containing materials
AE	Agricultural Exclusive
AEC	Atomic Energy Commission
AER	Annual Emissions Reporting
AHMs	acutely hazardous materials
AMP	air monitoring plan
AMSL	above mean sea level
AOCs	Administrative Orders on Consent
APCD	Air Pollution Control District
AQMP	air quality management plan
ARARs	applicable or relevant and appropriate regulations
ARB	Air Resources Board
ARMR	Archaeological Resources Management Report
ASF	age sensitivity factors
ASTs	aboveground storage tanks
ATCM	airborne toxics control measure
AVAQMD	Antelope Valley Air Quality Management District
BACT	best available control technology
BMPs	best management practices
BO	Biological Opinion
C-4	composition C
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAAQS	California Ambient Air Quality Standards
CalARP	California Accidental Release Prevention

Cal-OSHA	California Division of Occupational Safety and Health
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CBC	California Building Code
CCAA	California Clean Air Act
CCPS	Center for Chemical Process Safety
CCR	California Code of Regulations
CDF	California Department of Forestry and Fire Protection
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CEDU	California Energy Demand Update
CEM	Conceptual Exposure Model
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	methane
CIWMP	Countywide Integrated Waste Management Plan
CLADPW	Los Angeles County Department of Public Works
CMA	Critical Movement Analysis
CNDDB	California Natural Diversity Database
CNG	compressed natural gas
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
COC	chemicals of concern
COPC	chemicals of potential concern
CPF	Cancer Potency Factor
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRLF	California red-legged frog
CRMP	Cultural Resources Management Plan
CRPR	California Rare Plant Rank
Cs-137	Cesium-137
CSE	Countywide Siting Element

CTE	central tendency exposure
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
CY	cubic yards
DCA	dichloroethane
DHS	Department of Health Services
DNL	day-night sound level
DOD	Department of Defense
DOE	Department of Energy
DPM	diesel-fueled engines
DPR	Department of Parks and Recreation
DTSC	Department of Toxic Substances Control
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EKCAPCD	Eastern Kern County Air Pollution Control District
EPC	exposure point concentration
ERH	Electrical Resistance Heating
ESA	Environmental Science Associates
ESAs	Environmentally Sensitive Areas
ESL	ecological screening levels
ETEC	Energy Technology Engineering Center
EVSE	electric vehicle supply equipment
FAR	Fire Affected Rock
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHSZs	Fire Hazard Severity Zones
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Mapping
FONSI	Finding of No Significant Impact
FTA	Federal Transit Administration
GAP	glycidyl azide polymer
GBUAPCD	Great Basin Unified Air Pollution Control District
GBVAB	Great Basin Valleys Air Basin
GETS	Groundwater Extraction Treatment System
GHG	greenhouse gas
GIS	geographic information system

GPS	Global Positioning System
GVWR	gross vehicle weight rating
GWIM	Groundwater Interim Measure
GWP	Global Warming Potentials
HAER	Historic American Engineering Record
HAPs	Hazardous Air Pollutants
HCM	Highway Capacity Manual
HDPE	high-density polyethylene
HFCs	hydrofluorocarbons
HSC	Health and Safety Code
HSP	Health and Safety Plan
HWCL	Hazardous Waste Control Law
HWMF	Hazardous Waste Management Facility
ICAPCD	Imperial County Air Pollution Control District
IPCC	Intergovernmental Panel on Climate Change
JMA	John Minch and Associates
KCAPCD	Kern County Air Pollution Control District
KOP	Key Observation Point
Kw	Whole Soil K
LACDPW	Los Angeles County Department of Public Works
LADOT	Los Angeles Department of Transportation
LAMC	Los Angeles Municipal Code
LARWQCB	Los Angeles Regional Water Quality Control Board
LBP	lead-based paint
LeE2	Linne silty clay loam
LCFS	Low Carbon Fuel Standard
LLRW	Low-level radioactive waste
LMEC	Liquid Metals Engineering Center
LNG	liquefied natural gas
LoE2	Los Osos clay
LOS	levels of service
LOX	Liquid Oxygen Plant
LSM	less than significant with mitigation
LSTs	Localized Significance Thresholds
LTS	less than significant
LUT	Look-Up Table

MACT	maximum achievable control technology
MBTA	Migratory Bird Treaty Act
MCA	Medieval Climatic Anomaly
MCL	maximum concentration limits
MCV2	Manual of California Vegetation 2nd edition
MDAB	Mojave Desert Air Basin
MDAQMD	Mojave Desert Air Quality Management District
ML	Richter magnitude
MLD	Most Likely Descendant
MMH	monomethyl hydrazine
MMRP	Mitigation Monitoring and Reporting Program
MMT	million metric tons
MNA	monitored natural attenuation
MND	Mitigated Negative Declaration
MPO	metropolitan planning organization
MRCA	Mountains Recreation and Conservation Authority
MRP	Mineral Resource Protection
MS4	Municipal Storm Sewer System
MT	metric ton
Mw	Moment Magnitude
N2O	nitrous oxide
NAA	North American Aviation
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NaK	sodium potassium
NARM	naturally occurring and/or accelerator-produced radioactive material
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NI	no impact
NMFS	National Marine Fisheries Service
NNSS	Nevada National Security Site
NO	nitric oxide
NO_2	nitrogen dioxide
NOA	Notice of Availability
NOC	Notice of Completion

NOI	Notice of Intent
NOP	Notice of Preparation
NORM	naturally occurring radioactive material
NO_X	oxides of nitrogen
NPDES	National Pollutants Discharge Elimination System
NPL	National Priority List
NPPA	Native Plant Protection Act
NPS	National Park Service
NRA	National Recreation Area
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSF	National Science Foundation
NTO	nitrogen tetraoxide
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
OES	Office of Emergency Services
OHP	Office of Historic Preservation
OPR	Office of Planning and Research
OS	Open Space
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PA	Programmatic Agreement
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCE	passenger car equivalent
PCI	Pavement Condition Index
PEIR	Program Environmental Impact Report
PFCs	perfluorocarbons
PGA	peak ground acceleration
PI	plasticity index
PM	particulate matter
PM10	respirable particulate matter
PM2.5	fine particulate matter
PMP	Program Management Plan
POA	Plan of Action
PPV	peak particle velocity

PQS	professional qualifications standards
PRC	Public Resources Code
PRMMP	Paleontological Resources Monitoring and Mitigation Plan
PRPA	Paleontological Resources Preservation Act
PVC	polyvinyl chloride
Qa	Quaternary alluvium
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigations
RMDF	Radioactive Materials Disposal Facility
RME	reasonable maximum exposure
RMHF	Radioactive Materials Management Facility
RMS	root mean square
ROC	reactive organic compounds
ROD	Record of Decision
ROG	reactive organic gases
ROW	right-of-way
RPS	Renewables Portfolio Standard
RPs	Responsible Parties
RRP	Road Restoration Plan
RWQCB	Regional Water Quality Control Board
SAA	streambed alteration agreement
SB	Senate Bill
SBZ	Southern Buffer Zone
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCCAB	South Central Coast Air Basin
SCCIC	South Central Coastal Information Center
SCE	Southern California Edison
SCS	sustainable communities strategies
SEA	Significant Ecological Area
SF_6	sulfur hexafluoride
SFVAS	San Fernando Valley Audubon Society
SHPO	State Historic Preservation Officer

SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLR	single-lens reflex
SMARTS	Stormwater Multiple Applications and Report Tracking Systems
SMMNRA	Santa Monica Mountains National Recreation Area
SNAP	Systems for Nuclear Auxiliary Power
SO_2	sulfur dioxide
SO_4	sulfates
SOI	Secretary of the Interior
SO_X	oxides of sulfur
SP	Specific Plan
SPTF	Sodium Pump Test Facility
SR	State Route
SRAIPs	Soils Remedial Action Implementation Plan(s)
SRAM	Standardized Risk Assessment Methodology
SRE	Sodium Reactor Experiment
SSAB	Salton Sea Air Basin
SSFL	Santa Susana Field Laboratory
STPs	Shovel Test Pits
SvF2	Soper gravelley clay loam
SVOCs	semi-volatile organics
SWMUs	Solid Waste Management Units
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	toxic air contaminants
TCE	trichloroethene
TCMs	traffic control measures
TCP	Traditional Cultural Property
TDM	Transportation Demand Management
TEA/TEB	triethylaluminum/triethylborane
TENORM	technologically enhanced naturally occurring radioactive material
TMDL	Total Maximum Daily Load
TMP	Trail Management Plan
TNM	Traffic Noise Model
TOU	Time-Of-Use

TPH	total petroleum hydrocarbon
TRB	Transportation Research Board
TSCA	Toxic Substances Control Act
TTF	Thermal Treatment Facility
UCLs	Upper Confidence Limits
UDMH	unsymmetrical dimethyl hydrazine
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USC	United States Code
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USNRC	United States Nuclear Regulatory Commission
USTs	underground storage tanks
VCAPCD	Ventura County Air Pollution Control District
VCOES	Ventura County Office of Emergency Services
VMT	vehicle miles travelled
VOCs	volatile organic compounds
VRM	Visual Resource Management
WDR	Waste Discharge Requirements
WEAP	Worker Environmental Awareness Program
WQC	Water Quality Certification
ZmD2	Zamora clay loam

CHAPTER 11
Glossary

Administrative Orders on Consent: An Administrative Order on Consent (AOC) is a legal document signed by the USEPA directing an individual, business, or other entity through which the violator agrees to pay for correction of violations, take the required corrective or cleanup actions, or refrain from an activity. It describes the actions to be taken. The 2007 Administrative Order for Corrective Action (2007 Consent Order) is the initial agreement that DTSC and the three RPs—Boeing, NASA, and DOE—entered into to define the requirements for investigation of contamination in soil and groundwater, and to implement the associated cleanup at SSFL. The subsequent 2010 Administrative Orders on Consent for Remedial Action further defined obligations regarding the investigation and cleanup of soil within NASA's and DOE's administrative areas.

Applicable or Relevant and Appropriate Regulations: Applicable requirements are cleanup standards, standards of control, and other substantive requirements, criteria or limitations promulgated under Federal environmental or State environmental or facility siting laws that directly and fully address a hazardous substance, pollutant, contaminant, action being taken, or other circumstances found at a CERCLA site. Applicability is a legal and jurisdictional determination, while relevance and appropriateness relies on the professional judgement of the individual performing the analysis utilizing information pertinent to the specific site.

Aquifer: A water-bearing layer of rock or sediment that is capable of yielding useable amounts of water.

Best Management Practice (BMP): Practices and/or procedures to prevent pollution in stormwater discharge.

California Department of Toxic Substances Control (DTSC): A department within the California Environmental Protection Agency in charge of regulating hazardous waste from generation to final disposal and overseeing the investigation and cleanup of hazardous waste sites.

California Environmental Quality Act (CEQA): Enacted in 1970 to provide long-term environmental protection, this law requires that governmental decision makers and public agencies study the environmental effects of proposed activities and that significant adverse effects be avoided or reduced where feasible.

Chatsworth Formation Operable Unit (OU): The Chatsworth Formation OU consists of groundwater and both the saturated and unsaturated unweathered (competent) bedrock of the Chatsworth Formation. The Chatsworth Formation bedrock is composed of thickly bedded

sandstone with interbeds of siltstone and shale and is unweathered and competent within the Chatsworth Formation OU.

Chemicals of Concern: Chemical elements or compounds (e.g., trichloroethene) that may or may not be present at a project area.

Chemicals of Potential Concern (COPCs): Are chemicals that are potentially site related and of sufficient quality to quantify risk.

Closure under RCRA: At Treatment, Storage and Disposal Facilities where multiple hazardous waste management units are in operation, one unit may cease operation while the remaining units continue operating. This is known as partial closure. The closed units, or inactive portion of the facility, are subject to all applicable closure standards. Final closure occurs when all hazardous waste management units cease operation and close according to the regulations.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law enacted by the U.S. Congress on December 11, 1980, as amended on October 17, 1986, to provide broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

Construction: Excavation of soils, restoration of disturbed areas, demolition and removal of facilities, and the construction of soil and groundwater treatment systems (e.g., soil vapor extraction systems, biotreatment systems, extraction wells, and groundwater treatment systems).

Corrective Measure Study/Feasibility Study (CMS/FS): A study conducted by the facility owner/operator to identify and evaluate alternative cleanup options to address contamination at a project site.

Cultural Resources Management Plan (CRMP): A plan documenting the actions and procedures to be followed to ensure avoidance or minimization of impacts to cultural resources consistent with CEQA Guidelines Section 15126.4(b), and to lay out a detailed program of mitigation for direct and indirect impacts on cultural resources during project implementation. \

Emergency Planning and Community Right-to-Know Act: The Emergency Planning and Community Right-to-Know Act (EPCRA) was passed in 1986 in response to concern regarding the environmental and safety hazards posed by the storage and handling of toxic chemicals. Congress imposed requirements for federal, state, and local governments, tribes, and industry, which cover emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals. The Community Right-to-Know provisions help increase the public's knowledge and access to information at individual facilities, their uses, and releases into the environment. States and communities working with facilities, can use the information to improve chemical safety and protect public health and the environment.

Exception: Both the 2007 Consent Order and 2010 AOCs state that actions taken pursuant to the orders must be taken in accordance with local, state, and federal laws, which would include laws and regulations related to protecting biological resources or cultural resources. These biological and cultural resources constraints are described as “exemptions” in the 2010 AOCs and as

"exceptions" in the Final Agreement in Principal" (AIP). While the AOCs generally provide for "exemptions," these measures are defined in the AIP (the document by which DOE and NASA have agreed will govern the how the cleanup is conducted) in detail and are referred to as "exceptions." As such, in this PEIR, DTSC refers to these provisions as "AOC exceptions" or "exceptions."

Exemption: See "exception."

Extraction Wells: Wells that are used primarily to remove contaminated groundwater from the ground. Water level measurements and water samples can also be collected from extraction wells.

Facility: *Dictionary Definition*: Something that is built, installed, or established to serve a particular purpose. Often used in this document to describe built environment features at the site that would be demolished.

RCRA Definition: All contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units (e.g., one or more landfills, surface impoundments, or combinations of them).

Feature: A part of or specific structure within a facility.

Groundwater Extraction and Treatment System (GETS): The mechanical system that treats contaminated groundwater for discharge within permitted limits. The treatment process at the GETS facility include filtration, ion exchange, air stripping with vapor phase carbon treatment, liquid phase carbon adsorption, and ultraviolet light and peroxide treatment.

Groundwater Interim Measure (GWIM): The infrastructure and activities (including the GETS, pumping equipment, and piping) that addresses COPCs in Chatsworth Formation OU groundwater beneath the SSFL.

A Groundwater Interim Measures Work Plan (GWIM WP): The work plan that presents the approach for evaluating and implementing the GWIM.

Historic-Period Built Environment: Includes standing structures, infrastructure, and landscapes of historic or aesthetic significance that are generally 50 years of age or older.

Impacted Soil and Groundwater: Soil contaminated by chemicals and/or radionuclides

In Situ Treatment: Technology that treats contaminants in place within the soil or in groundwater. It typically involves injection of a material such as air, gases, chemical or biological reagents, liquids (e.g., permanganate, or lactose), or solid materials (e.g. fertilizer) to chemically alter the contaminant or to encourage bacteria in the soil to aid in the treatment.

Low Carbon Fuel Standard (LCFS): One of the nine discrete early action measures to reduce California's greenhouse gas emissions that cause climate change. The LCFS is designed to encourage the use of cleaner low-carbon fuels in California, encourage the production of those

fuels, and therefore, reduce GHG emissions. The LCFS standards are expressed in terms of the "carbon intensity" of California's transportation fuels will be reduced. The program is based on the principle that each fuel has "lifecycle" GHG emissions that include carbon dioxide, nitrous oxide, and other greenhouse gas contributors. This lifecycle assessment examines the GHG emissions associated with the production, transportation, and use of a given fuel.

Low-level Radioactive Waste (LLRW): Low-level waste does not fit into the categorical definitions for intermediate or high-level waste, or for other types of radioactive wastes. It is a category of radioactive wastes that do not fit into the other categories It generally includes items that have become contaminated with radioactive material or have become radioactive through exposure to neutron radiation.

Maximum Achievable Control Technology (MACT): Maximum achievable control technology (MACT) standards were developed by the USEPA to reduce the effects of Hazardous Air Pollutants (HAPs) generated by industry. MACT standards affect sources (new and old) by making them meet specific emissions limits. These limits are based on the emissions levels already achieved by the best-performing similar facilities.

Monitored Natural Attenuation (MNA): Natural attenuation is a term for the natural processes that lead to decreasing concentrations of COPCs over time. MNA is measuring, and evaluating these natural processes over time.

Naturally Occurring or Accelerator-Produced Radioactive Material (NARM and NORM): Naturally occurring or accelerator-produced radioactive material (NARM) are radioactive materials not covered under the Atomic Energy Act that are naturally occurring or produced by an accelerator. These materials have been traditionally regulated by the States. A subset of NARM is NORM.

Notice of Preparation (NOP): A CEQA document to be sent by the lead agency to notify the public, responsible agencies, trustee agencies, and involved federal agencies that an EIR is being prepared.

Operable Unit (OU): During cleanup, a site can be divided into a number of distinct areas depending on the complexity of the problems associated with the site. These areas are called operable units and may address geographic areas of a site, specific site problems, or areas where a specific action is required.

Operation: The operational phases of treatment technologies (e.g., soil vapor extraction, groundwater extraction and treatment, in situ or ex situ bioremediation, air sparging systems, etc.), but do not include soil excavation

Paleontological Resources Monitoring and Mitigation Plan (PRMMP): Contains all the mitigation measures required to reduce some long-term and indirect impacts to unique paleontological resources or unique geologic features by providing requirements for qualified professionals, sensitivity training, monitoring and procedures for discovery and fossil recovery in

the event resources are encountered, as well as procedures for sediment sampling, documentation and curation for any specimens salvaged during monitoring.

Pavement Conditions Index (PCI): Rates the condition of road segments within road network, where 0 is the worst possible conditions and 100 is the best. The PCI measures two conditions: (1) the type, extent and severity of pavement surface distresses (typically cracks and rutting), and (2) the smoothness and ride comfort of the road. The PCI tells public works officials the current condition of the road network and the rate of deterioration of the road network over time.

Plan of Action: The Native American Graves Protection and Repatriation Act (Public Law 101-601, 25 USC Section 3001) implementing regulation 43 CFR Part 10.3(c)(2) requires a federal agency to prepare a written Plan of Action (POA) whenever there is activity affecting or likely to affect Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony on federal or tribal lands. The POA is prepared in consultation with Indian tribes, that outlines the planned treatment, care, handling, and disposition of human remains funerary, sacred objects, or objects of cultural patrimony.

Plasticity Index (PI): The numerical difference between the Liquid Limit and Plastic Limit is termed the PI. The Liquid Limit of a soil is the moisture content above which the soil behaves as a liquid, the Plastic Limit is the moisture content above which the soil behaves plastically.

Program Management Plan (PMP): The PMP describes how the 2007 Consent Order and 2010 AOCs would be implemented moving forward.

Programmatic Agreement (PA): A document that spells out the terms of a formal, legally binding agreement between a state agency and other state and/or federal agencies. A PA establishes a process for consultation, review, and compliance with one or more federal laws, most often with those federal laws concerning historic preservation.

Resource Conservation and Recovery Act (RCRA): A federal law that establishes a regulatory system to track and provide safe procedures for management of hazardous wastes from the time of generation to final disposal.

Remedial Action Plan (RAP): The Remedial Action Plans (RAP) is the DTSC's remedy selection document for hazardous substance release sites addressed pursuant to Health and Safety Code section 25356.1. A RAP clearly and concisely reflects the remedial action decision reached by: identifying the preferred alternative for a remedial action and explaining the reasons for the preference; describing the other remedial alternatives considered; and soliciting public review and comments on all the alternatives described.

Remediation: Cleanup or other methods used to remove or contain a toxic spill or hazardous materials from a site.

Record of Decision (ROD): A concise public document that records a Federal agency's decision(s) concerning a proposed action for which the agency has prepared an environmental impact statement.

Responsible Parties (RPs): The RPs for SSFL are the company and federal agencies responsible for the contamination and responsible for cleanup. The 2007 Consent Order is the initial agreement that DTSC and the three RPs—Boeing, NASA, and DOE—entered into to define the requirements for investigation of contamination in soil and groundwater, and to implement the associated cleanup at SSFL.

Sacred Sites Council: A group that includes representatives of the federally recognized Santa Ynez Band, and the non-federally recognized Fernandeño/Tataviam and Gabrielino/Tongva.

Significant Ecological Area (SEA): Officially designated areas within the Los Angeles County identified for their biological value. These areas warrant special management because they contain biotic resources that are considered to be rare or unique; are critical to the maintenance of wildlife; represent relatively undisturbed areas of County habitat types; or serve as linkages.

Standardized Risk Assessment Methodology (SRAM): Initially prepared in 2000 to establish a consistent technical approach for risk assessment and setting risk based cleanup standards at SSFL. Since that time two significant updates have occurred, one in 2005 and the latest one in 2014; these updates were prepared to incorporate the latest USEPA and DTSC risk assessment policies and procedures and to incorporate a more refined understanding of the overall Conceptual Site Model.

Soil Vapor Extraction (SVE): Removes contaminant vapors from below ground for treatment above ground. Vapors are gases that form when chemicals evaporate. SVE extracts vapors from the soil above the water table by applying a vacuum to pull the vapors out.

Supernatant: The clear liquid overlying material deposited by settling, precipitation, or centrifugation

Surficial Media: One of the two operable units (OU). The Surficial Media OU includes soil, sediment, and weathered bedrock. It also includes surface water, near surface groundwater, air, and biota.

Traditional Cultural Property (TCP): A property that is eligible for inclusion in the National Register of Historic Places (NRHP) based on its associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community. TCPs are rooted in a traditional community's history and are important in maintaining the continuing cultural identity of the community.

Waste Discharge Requirements (WDRs): Regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act.

Worker Environmental Awareness Program (WEAP): Includes materials to aid workers in identifying sensitive habitats, plants, and wildlife that should be avoided; applicable laws and regulations protecting such resources; and proper avoidance and communication procedures to protect sensitive biological resources, as well as common wildlife whenever possible.

CHAPTER 12
List of PEIR Preparers and Organizations and Persons Contacted

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