



Environmental Assessment, Finding of No Significant Impact/Finding of No Practicable Alternative

for

Replacement of Overhead Electrical Line,
Feeders K1 and K7

Vandenberg Air Force Base,
California

19 September 2012

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FINAL DRAFT FINDING OF NO SIGNIFICANT IMPACT AND FINDING OF NO PRACTICABLE ALTERNATIVE

Replacement of Overhead Electrical Line, Feeders K1 and K7 at Vandenberg Air Force Base, California

Pursuant to provisions of the National Environmental Policy Act (NEPA), 42 United States Code (USC) 4321 to 4370d, implementing Council on Environmental Quality (CEQ) Regulations, 40 Code of Federal Regulations (CFR) 1500-1508, and 32 CFR Part 989, Environmental Impact Analysis Process, the U.S. Air Force (Air Force) assessed the potential environmental consequences associated with replacing an aging overhead electrical line, Feeders K1 and K7, on Vandenberg Air Force Base (AFB) in Santa Barbara County, California.

These replacements are needed because existing conditions do not provide a reliable power source required to support Vandenberg AFB's launch and range mission. If these lines are not replaced, electrical supply to several of Vandenberg AFB's facilities may fail. If such failure happens during mission-essential operations (e.g., space launch preparations and space launches) key national defense missions may be delayed or cancelled. This could negatively impact United States security and safety.

The Environmental Assessment (EA), incorporated by reference into this finding, analyzes the potential environmental consequences of activities associated with replacing an overhead electrical line, Feeders K1 and K7, and provides environmental protection measures to avoid or reduce adverse environmental impacts. The EA considers all potential impacts of Alternative A (Proposed Action), Alternative B (Realigned Alternative), and the No-Action Alternative. The EA also considers cumulative environmental impacts with other projects at Vandenberg AFB.

ALTERNATIVE A (PROPOSED ACTION)

The Proposed Action includes demolition and replacement of existing electrical lines and construction of new overhead electrical lines and permanent access roads. Approximately 110,880 linear feet (21 miles) of existing overhead electrical lines would be replaced on the southwestern portion of South Vandenberg AFB. The new overhead electrical lines would be adjacent to existing roads to the extent feasible, thus providing easy access and facilitating regular maintenance. In areas where new feeder alignments cannot be located near existing roads, access roads would be established. To prevent electrical service interruptions on South Vandenberg AFB, the existing lines would remain operational until installation, testing, and initial operation of the new lines is completed. After the new lines are working properly, the existing lines (i.e., wires, electrical equipment, and poles) would be removed. The new overhead electrical lines would be inspected annually and maintained.

ALTERNATIVE B (REALIGNED ALTERNATIVE)

Alternative B is the same as Alternative A (Proposed Action), except that a segment of the existing line would be abandoned in-place and a portion of the new overhead electrical lines would be realigned to avoid sensitive archaeological resources. Portions of Feeder Lines K1 and K7 would be realigned to avoid adverse impacts on National Register of Historic Places (NRHP)-eligible sites, as follows: 1) one existing pole would be relocated 150 feet away from the Honda Ridge Rock Art site and would no longer be a visual obstacle in front of the rock art site; 2) the existing electrical line segment between Clark and Santa Ynez Roads would be abandoned in-place and operate as an emergency backup system; 3) the proposed route located approximately 4,200 feet east of Arguello Boulevard would be adjacent to an existing road north of the Alternative A route; and 4) the proposed route would be adjacent to Spin Road between Coast Road and the eastern end of Spin Road.

NO-ACTION ALTERNATIVE

Under the No-Action Alternative, the Proposed Action would not occur and mission operations on South Vandenberg AFB would be subject to unexpected delays due to powerline failures. This alternative would not provide a reliable power source required to support mission and security operations on South Vandenberg AFB.

SUMMARY OF FINDINGS

The analyses of the affected environment and environmental consequences of implementing the Proposed Action presented in the EA concluded that by implementing environmental protection measures (EA Section 2.5) as well as the avoidance, minimization, monitoring, and reporting measures in Appendix C of the EA, Vandenberg AFB would be in compliance with all terms and conditions and reporting requirements for implementation of the reasonable and prudent measures stipulated in the United States Fish and Wildlife Service (USFWS)'s Biological Opinion, and adhering to the conditions stipulated in the State Historic Preservation Officer (SHPO) concurrence letter.

The Air Force has concluded that no significant adverse effects would result to the following resources as a result of the Proposed Action: air quality, greenhouse gases, biological resources, geology and earth resources, land use and coastal zone resources, noise, public health and safety, transportation, and water resources. No significant adverse cumulative impacts would result from activities associated with Alternative A (Proposed Action) or Alternative B (Realigned Alternative) when considered with past, present, or reasonably foreseeable future projects at Vandenberg AFB. In addition, the EA concluded that the action alternatives would not affect environmental justice, socioeconomics, public services and utilities, nor recreation.

The Air Force determined that implementing Alternative A (Proposed Action) would result in adverse direct and cumulative impacts on four archaeological sites that are eligible for listing on the NRHP. Therefore, the Air Force developed Alternative B (Realigned Alternative) to avoid impacts on the four archaeological sites.

Cultural Resources

Under Alternative B (Realigned Alternative), Vandenberg AFB would avoid negative impacts on four archaeological sites by abandoning in-place a segment of the existing line and realigning a portion of the new overhead electrical lines. In addition, the EA stipulated environmental protection measures, including installation of temporary exclusionary fencing, prohibiting vehicular access within NRHP-eligible sites, adherence to 36 CFR 800.13 and Vandenberg AFB Integrated Cultural Resources Management Plan procedures, and compliance with all conditions stipulated in SHPO's concurrence letter (dated April 23, 2012) would further ensure that NRHP-eligible sites are not adversely affected under Alternative B (Realigned Alternative).

PREFERRED ALTERNATIVE

Alternative B (Realigned Alternative) is the Preferred Alternative because it is the only alternative that fulfills the purpose and need for the Proposed Action while avoiding significant adverse impacts to sensitive archaeological sites.

PRACTICABLE ALTERNATIVE

The Preferred Alternative would include activities within the 100-year floodplain of the Santa Ynez River, as defined by the Federal Emergency Management Agency. Activities that would occur within the floodplain would include demolition and replacement of existing electrical lines and construction of new overhead electrical lines. No access roads would be constructed within the floodplain. Because the K7 Feeder Line poles are situated at the upland boundary of the floodplain and it is unlikely that the individual power poles would impede floodwaters in a flood event, proposed activities would not alter the floodplain to a degree that would result in adverse effects. The floodplain limits in the vicinity of the project area would not be altered by activities associated with the Preferred Alternative. The 100-year floodplain limit and duration of flooding within the project area would remain unchanged by the Preferred Alternative.

It is not practicable to re-route portions of Feeder Line K7 outside the 100-year floodplain because Feeder Line K7 must connect with other feeder lines and therefore cannot be diverted from dependent circuits. Existing buildings in the 100-year floodplain within the South Vandenberg cantonment area require electricity. Realigning these segments of Feeder Line K7 would place the feeder line in closer proximity to sensitive archaeological sites. New access roads would have to be constructed to provide access along the realigned route outside the floodplain. Due to these reasons, no practicable alternative to the Preferred Alternative is possible.

FINDING OF NO PRACTICABLE ALTERNATIVE

Pursuant to Executive Order 11988 and 32 CFR 989.14(g), the authority delegated in Secretary of the Air Force Order (SAFO) 791.1, and taking the information contained in the attached EA into consideration, I find that there is no practicable alternative to implementing the Preferred Alternative within the 100-year floodplain of the Santa Ynez River.

FINDING OF NO SIGNIFICANT IMPACT

Based on my review of the facts and analyses contained in the attached EA, conducted under the provisions of NEPA, CEQ Regulations, and 32 CFR Part 989, I conclude that Alternative B (Realigned Alternative) would not have a significant environmental impact either by itself or cumulatively with other projects at Vandenberg AFB. Accordingly, an Environmental Impact Statement is not required. The signing of this Finding of No Significant Impact and Finding of No Practicable Alternative completes the environmental impact analysis process.



FOR
JOSEPH H. SCHWARZ, Colonel, USAF
Deputy Director for Installations
and Mission Support

19 SEP 12

Date

Table of Contents

Chapter 1	Purpose and Need for the Proposed Action	1-1
1.1	Purpose of the Proposed Action	1-1
1.2	Need for the Proposed Action	1-1
1.3	Project Location	1-1
1.4	Legal Requirements	1-3
1.5	Interagency Coordination and Consultation	1-3
1.6	Objectives of the Environmental Assessment	1-3
Chapter 2	Proposed Action and Alternatives	2-1
2.1	Selection Standards for Alternatives	2-1
2.2	Alternative A: Proposed Action	2-1
2.3	Alternative B: Realigned Alternative	2-3
2.4	Alternative C: No-Action Alternative	2-4
2.5	Environmental Protection Measures	2-4
2.6	Other Alternatives Considered	2-8
2.7	Preferred Alternative	2-9
Chapter 3	Affected Environment	3-1
3.1	Air Quality	3-1
3.1.1	Regional Setting	3-1
3.1.2	Greenhouse Gas Emissions	3-3
3.1.3	Applicable Regulations and Standards	3-4
3.2	Biological Resources	3-5
3.2.1	Methodology	3-5
3.2.2	Vegetation Types	3-6
3.2.3	Wildlife Species	3-7
3.2.4	Special Status Species	3-8
3.2.5	Waters of the U.S. and Wetlands	3-11
3.3	Cultural Resources	3-12
3.3.1	Area of Potential Effects	3-12
3.3.2	Cultural Setting	3-12
3.3.3	Cultural Resources within the Project Area	3-13
3.4	Geology and Earth Resources	3-13
3.4.1	Soils	3-15
3.4.2	Faulting and Seismicity	3-15
3.4.3	Geologic Hazards	3-15
3.5	Land Use and Coastal Zone Resources	3-15
3.6	Noise	3-16
3.6.1	Noise Characteristics	3-16
3.6.2	Sound Level and Frequency	3-17
3.6.3	Noise Descriptors	3-17
3.6.4	Human Response to Noise	3-17
3.6.5	Existing Noise Sources	3-18
3.7	Public Health and Safety	3-18
3.7.1	Hazardous Materials Management	3-18
3.7.2	Hazardous Waste Management	3-19
3.7.3	Installation Restoration Program	3-20
3.7.4	Unexploded Ordnance	3-21
3.8	Transportation	3-21
3.8.1	Roadway Operations	3-21

3.9	Water Resources	3-21
3.9.1	Surface Water	3-22
3.9.2	Groundwater	3-23
Chapter 4	Environmental Consequences	4-1
4.1	Air Quality	4-1
4.1.1	Alternative A: Proposed Action	4-1
4.1.2	Alternative B: Realigned Alternative	4-3
4.1.3	Alternative C: No-Action Alternative	4-3
4.2	Biological Resources	4-3
4.2.1	Alternative A: Proposed Action	4-3
4.2.2	Alternative B: Realigned Alternative	4-5
4.2.3	Alternative C: No-Action Alternative	4-5
4.3	Cultural Resources	4-5
4.3.1	Alternative A: Proposed Action	4-6
4.3.2	Alternative B: Realigned Alternative	4-7
4.3.3	Alternative C: No-Action Alternative	4-7
4.4	Geology and Earth Resources	4-7
4.4.1	Alternative A: Proposed Action	4-8
4.4.2	Alternative B: Realigned Alternative	4-9
4.4.3	Alternative C: No-Action Alternative	4-9
4.5	Land Use and Coastal Zone Resources	4-9
4.5.1	Alternative A: Proposed Action	4-9
4.5.2	Alternative B: Realigned Alternative	4-10
4.5.3	Alternative C: No-Action Alternative	4-10
4.6	Noise	4-10
4.6.1	Alternative A: Proposed Action	4-10
4.6.2	Alternative B: Realigned Alternative	4-11
4.6.3	Alternative C: No-Action Alternative	4-11
4.7	Public Health and Safety	4-11
4.7.1	Alternative A: Proposed Action	4-11
4.7.2	Alternative B: Realigned Alternative	4-13
4.7.3	Alternative C: No-Action Alternative	4-13
4.8	Transportation	4-13
4.8.1	Alternative A: Proposed Action	4-13
4.8.2	Alternative B: Realigned Alternative	4-13
4.8.3	Alternative C: No-Action Alternative	4-13
4.9	Water Resources	4-14
4.9.1	Alternative A: Proposed Action	4-14
4.9.2	Alternative B: Realigned Alternative	4-15
4.9.3	Alternative C: No-Action Alternative	4-16
4.10	Cumulative Impacts	4-16
4.10.1	Projects Considered in the Cumulative Analysis	4-16
4.10.2	Cumulative Impact Analysis	4-16
Chapter 5	List of Preparers	5-1
Chapter 6	List of Agencies, Organizations, and Persons Contacted	6-1
Chapter 7	References	7-1

Appendices

- A Air Quality Emissions Calculations
- B Regulatory Correspondence
 - B-1 Endangered Species Act Regulatory Consultation
 - B-2 National Historic Preservation Act Regulatory Consultation
 - B-3 Native American Consultation
 - B-4 Coastal Zone Management Act Regulatory Consultation
- C Avoidance, Minimization, Monitoring, Reporting Measures Tracking Sheet

List of Figures

- 1.1 Regional Map 1-2
- 3.9-1 100 Year Flood Plain and Drainages in Project Area 3-24

List of Tables

- 3.1-1 National and California Ambient Air Quality Standards 3-2
- 3.1-2 Santa Barbara County Air Quality Attainment Status 3-3
- 3.1-3 Ambient Air Quality at Vandenberg AFB 3-3
- 3.2-1 Percentage of Native and Non-native Vegetation in Project Area 3-6
- 3.2-2 Special Status Plant and Wildlife Species within the Project Area 3-8
- 3.3-1 Archaeological Sites within the Study Area 3-14
- 3.6-1 Definitions of Acoustical Terms 3-17
- 3.6-2 Typical Noise Levels in the Environment 3-18
- 3.7-1 AOCs and AOIs in the Project Area 3-20
- 4.1-1 Proposed Emissions under Alternative A (Proposed Action) (Tons/Year) 4-2
- 4.3-1 Environmental Consequences to Cultural Resources from the Proposed Action 4-6
- 4.3-2 Environmental Consequences to Cultural Resources from Alternative B 4-8
- 4.6-1 Estimated Construction/Demolition Equipment Noise Levels 4-10
- 4.10-1 Related and Cumulative Projects 4-17

Acronyms and Abbreviations

$\mu\text{g}/\text{m}^3$	Micrograms Per Cubic Meter
30 CES	30th Civil Engineer Squadron
30 CES/CEA	30th Civil Engineer Squadron, Asset Management Flight
30th CES/CEAN	30th Civil Engineer Squadron, Asset Management Flight, Natural Resources Management
30th CES/CEO	30th Civil Engineering Squadron/Operations Flight
30 CES/CEV	30th Civil Engineering Squadron, Environmental Flight
30 SW	30th Space Wing
30 SW/SE	30th Space Wing Safety Office
30 SW/SEW	30th Space Wing Safety-Weapon Safety
AFB	Air Force Base
Air Force	United States Air Force
AOC	Area of Concern
AOI	Area of Interest
APE	Area of Potential Effects
BMPs	Best Management Practices
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEPA	California Environmental Protection Agency
CAP	Collection Accumulation Point
CARB	California Air Resource Board
CCA	California Coastal Act
CCC	California Coastal Commission
CCR	California Code of Regulations
CDMG	California Division of Mines and Geology
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	CO_2 equivalent
CWA	Clean Water Act
dB	Decibel
DoD	Department of Defense
EA	Environmental Assessment
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impacts
FR	Federal Register
GHG	Greenhouse Gas
GIS	Geographic Information System
GWP	Global Warming Potential
HazMart	Hazardous Materials Pharmacy
Hz	Hertz
IRP	Installation Restoration Program

kV	Kilovolt
L _{eq}	Equivalent Noise Level
L _{eq[h]}	Hourly Equivalent Noise Level
LOS	Level of Service
N ₂ O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO _x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Place
O ₃	Ozone
OSHA	Occupational Safety and Health Act
PCBs	Polychlorinated biphenyls
PG&E	Pacific Gas & Electric
PM ₁₀	Particulate Matter Less Than 10 Microns In Diameter
PM _{2.5}	Particulate Matter Less Than 2.5 Microns In Diameter
POL	Petroleum, Oil, And Lubricants
ppm	Parts Per Million
RWQCB	Regional Water Quality Control Board
SAP	Satellite Accumulation Point
SBCAPCD	Santa Barbara County Air Pollution Control District
SCCAB	South Central Coast Air Basin
SHPO	State Historic Preservation Officer
SLC	Space Launch Complex
SR	State Route
SVPP	South Vandenberg Power Plant
SWP	Space Wing Plan
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
SYBCI	Santa Ynez Band of Chumash Indians
U.S.	United States
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound

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Chapter 1. Purpose and Need for the Proposed Action

This Environmental Assessment (EA) evaluates the potential environmental impacts associated with replacing an aging overhead electrical line on Vandenberg Air Force Base (AFB) in Santa Barbara County, California. There are numerous overhead electrical lines on Vandenberg AFB, spanning many miles of terrain. The current proposal addresses Feeder Lines K1 and K7 on South Vandenberg AFB. These feeder lines supply electrical power specifically to Vandenberg AFB radar facilities on Tranquillon Peak, Space Launch Complex (SLC)-6, and the South Base Cantonment area. The lines cover a distance of approximately 21 miles and are in need of new power poles and electrical equipment.

The National Environmental Policy Act (NEPA) of 1969, as amended, and Council on Environmental Quality (CEQ) regulations require lead agencies to evaluate the potential impacts of federal actions on the surrounding environment. The United States Air Force (Air Force or USAF) is the lead agency for NEPA compliance on the Proposed Action.

1.1 Purpose of the Proposed Action

The purpose of the Proposed Action is to replace the 12.47 kV overhead electrical line, Feeders K1 and K7, needed to support Vandenberg AFB 30th Space Wing's (30 SW) space launch mission and ensure adequate security. An additional purpose is to ensure access to Feeders K1 and K7 for scheduled routine maintenance.

1.2 Need for the Proposed Action

The Proposed Action is needed because existing Feeders K1 and K7 do not provide a reliable power source required to support Vandenberg AFB's launch and range mission. Many segments of the feeder lines traverse steep

terrain that is difficult to access, which precludes routine maintenance and has led to degradation of the electrical lines and equipment. Additionally, the deteriorated powerlines are unsafe and substantially increase the risk of sparking and igniting wildfires. Under present conditions, existing and future launch operations and range missions at several locations throughout South Vandenberg AFB would be subject to unexpected mission delays due to powerline failures. If these lines are not replaced electrical supply to several of Vandenberg AFB's facilities may fail. If such failure happens during mission-essential operations (e.g., space launch preparations and space launches) key national defense missions may be delayed or cancelled. This could negatively impact United States (U.S.) security and safety.

1.3 Project Location

Vandenberg AFB is headquarters for the 30 SW, the Air Force's Space Command unit that operates Vandenberg AFB and the Western Test Range/Pacific Missile Range (Western Range). Vandenberg AFB operates as an aerospace center that supports west coast launch activities for the Air Force, Department of Defense (DoD), National Aeronautics and Space Administration, and commercial contractors. The Air Force's primary missions at Vandenberg AFB are to launch and track satellites in space, test and evaluate intercontinental ballistic missile systems, and support aircraft operations in the Western Range.

Vandenberg AFB is located on the south-central coast of California, approximately 55 miles northwest of Santa Barbara (Figure 1-1). The Base covers approximately 99,000 acres in western Santa Barbara County. The Santa Ynez River and State Route (SR) 246 divide Vandenberg AFB into two distinct areas: North Vandenberg AFB and South Vandenberg AFB. The Proposed Action is located on South Vandenberg AFB between Point Arguello and West Ocean Avenue.

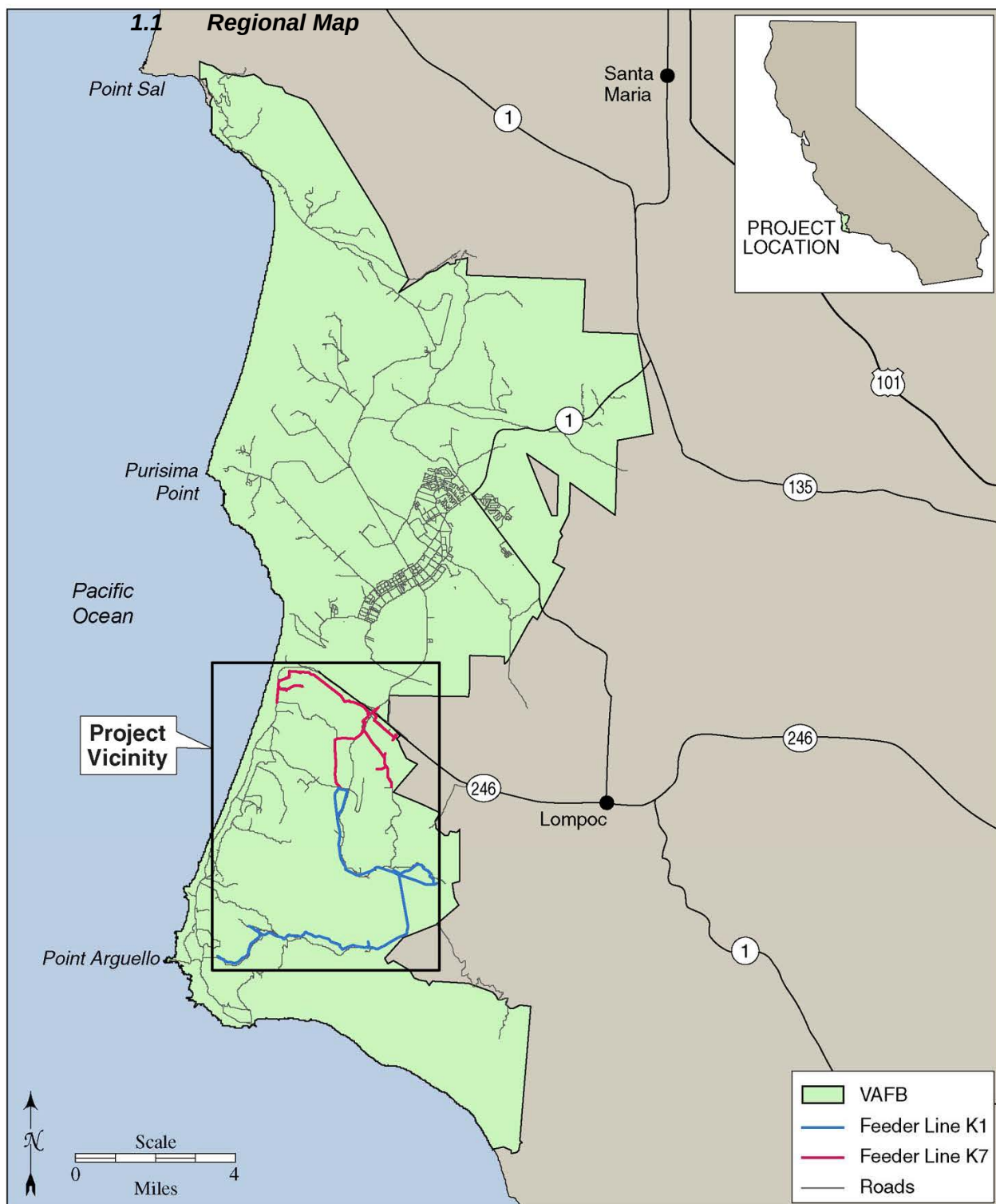


Figure 1-1. Regional Map

1.4 Legal Requirements

A required component of preparing this EA is a thorough identification of all environmental laws, regulations, and directives that would apply to the Proposed Action and alternatives. The Air Force will comply with all applicable federal, state, and local regulations.

1.5 Interagency Coordination and Consultation

Due to the known or potential occurrence of federally recognized threatened and endangered species within the project area, formal consultation with the United States Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act (ESA) was completed on May 9, 2012. USFWS issued a Biological Opinion on May 9, 2012 stating that with implementation of reasonable and prudent measures the proposed activities would not jeopardize the continued existence of any federally listed species. Vandenberg AFB will comply with all terms and conditions and reporting requirements stipulated in the Biological Opinion (refer to Appendix B-1 for details). Vandenberg AFB would be responsible for the funding, implementation, monitoring, and reporting requirements as stipulated by USFWS.

The Proposed Action is a federal undertaking subject to compliance with Section 106 of the National Historic Preservation Act (NHPA). As the Proposed Action has the potential to affect historic properties, Vandenberg AFB initiated consultation with the State Historic Preservation Officer (SHPO) under 36 Code of Federal Regulations (CFR) Part 800. Vandenberg AFB determined that implementation of the environmental protection measures and modifying the project design as proposed under Alternative B would ensure the Proposed Action would have no adverse effect upon any of the historic properties within the project area. The SHPO concurred with Vandenberg AFB's determination with conditions in a letter dated April 23, 2012. Vandenberg AFB will comply

with all conditions stipulated in SHPO's concurrence letter (refer to Appendix B-2 for details). Vandenberg AFB would be responsible for the funding, implementation, monitoring, and reporting requirements as stipulated by the SHPO.

The Air Force is required to consult with federally recognized Native American tribes that have an affiliation with Vandenberg AFB's property. The Air Force, therefore, consulted with the Santa Ynez Band of Chumash Indians (SYBCI). Vandenberg AFB sent two letters to the SYBCI informing them of the Proposed Action on April 28, 2011 and January 5, 2012 (refer to Appendix B-3 for details). Vandenberg AFB also arranged two site visits with the SYBCI on May 18, 2011 and January 11, 2012 to obtain their input on a power pole location adjacent to the Honda Ridge Rock Art Site (CA-SBA-550). The tribe verbally concurred with the Air Force on the Proposed Action, including the location of the new power pole by the rock art site. No written response was submitted by the tribe.

Where federal projects occur within the coastal zone (i.e., coastal waters, to include lands lying in coastal waters and submerged there under and adjacent shore lands) as defined in Section 304(1) of the Coastal Zone Management Act (CZMA) and as described in a state's federally approved Coastal Management Program, or where such projects may affect coastal uses or resources, they are subject to federal consistency review. The Air Force submitted a Negative Determination letter to the California Coastal Commission (CCC) on April 20, 2012 indicating that replacing electrical line Feeders K1 and K7 would not affect the coastal zone. The CCC concurred with Vandenberg AFB's determination in a letter dated July 9, 2012 (refer to Appendix B-4 for details).

1.6 Objectives of the Environmental Assessment

Consistent with 32 CFR Part 989 and CEQ regulations (40 CFR 1500-1508), the scope of

analysis presented in this EA is defined by the potential range of environmental impacts resulting from implementing the Proposed Action and alternatives, including the Realigned Alternative (Alternative B) and the No-Action Alternative. Resources potentially impacted are considered in more detail to determine whether additional analysis is required per 40 CFR Part 1501.4(c).

This EA identifies, describes, and evaluates the potential environmental impacts that could result from the Proposed Action and alternatives. As appropriate, the EA describes the affected environment and environmental consequences of the Proposed Action and identifies measures to prevent or minimize environmental impacts.

Portions of the proposed Feeder Line K7 are located within the Santa Ynez River floodplain. Alternative A (Proposed Action) and Alternative B would include activities at the upland boundary of the 100-year floodplain of the Santa Ynez River, as defined by the Federal Emergency Management Agency. Because Feeder Line K7 is connected to existing infrastructure and facilities that are not feasible to relocate, no practicable alternative to the Proposed Action is possible. Additionally, because portions of Feeder Line K7 are situated at the upland boundary of the floodplain, it is unlikely that the individual power poles would impede floodwaters in a flood event.

All other alternatives considered were dismissed due to environmental impacts, time constraints associated with permitting requirements, and economic infeasibility as described in Chapter 2. Per 32 CFR Part 989, and Executive Orders (EOs) 11988 and 11990, a Finding of No Significant Impact/ Finding of No Practicable Alternative (FONSI/FONPA) must be prepared. The resources analyzed in this EA include the following: air quality; biological resources; cultural resources; geology and earth resources; land use and coastal resources; noise; public health and safety; transportation; and water resources.

The following resources were considered but eliminated from detailed analysis in this EA since potential impacts would be non-existent or considered negligible.

- *Environmental Justice.* Per EO 12898, *Environmental Justice*, the potential effects of the Proposed Action on minority and low-income communities were considered. Because the Proposed Action would occur within Vandenberg AFB boundaries, minority and/or low-income populations within the region of influence (Lompoc and Santa Maria Valleys) would not be affected.
- *Socioeconomics.* Construction and operation of the Proposed Action would not affect the socioeconomic conditions of the region (Lompoc and Santa Maria Valleys).
- *Public Services and Utilities.* There would be no personnel stationed at Vandenberg AFB as a result of the Proposed Action. Consequently, the Proposed Action would not result in a need for substantial increases in public services or utilities.
- *Recreation.* Access to Vandenberg AFB is controlled by the Air Force; access to the project area is not open to the public for outdoor recreation.
- *Visual Resources.* Demolition of existing electrical lines and construction and annual maintenance of new overhead electrical lines would be consistent with the general military setting of Vandenberg AFB and would not significantly impact the existing visual quality of the project site and surrounding areas. In addition, proposed activities would occur in an area that is accessible only to military and authorized personnel. Therefore, impacts on visual resources would not occur.

Chapter 2. Proposed Action and Alternatives

This chapter explains the selection standards for screening alternatives for replacing the K1 and K7 electrical feeder lines. As required by the NEPA, the Air Force selected a minimum of three project alternatives, each to be evaluated for potential environmental impacts. The three alternatives include:

- Alternative A: the Proposed Action;
- Alternative B: the Realigned Alternative; and
- No-Action Alternative.

2.1 Selection Standards for Alternatives

CEQ Regulations for Implementing the Procedural Provisions of NEPA establish a number of policies for federal agencies, including “using the NEPA process to identify and assess the reasonable alternatives to the Proposed Action that will avoid or minimize adverse effects of these actions on the quality of the human environment” (40 CFR 1500.2 [e]). The range of reasonable alternatives in this EA was identified by evaluating their ability to meet the purpose and need of the Proposed Action and their ability to meet the following screening standards. To be considered reasonable an alternative must:

- Selection Standard 1: Be located on South Vandenberg AFB;
- Selection Standard 2: Provide a reliable power source required to support mission and security operations on South Vandenberg AFB;
- Selection Standard 3: Be located within areas where reasonable access is available to the new poles and powerlines for annual maintenance; and
- Selection Standard 4: Provide a redundant power source (i.e., one line operable at all times) during construction.

2.2 Alternative A: Proposed Action

The Proposed Action includes demolition and replacement of existing electrical lines and construction of new overhead electrical lines and permanent access roads over an approximately 16-month period for each line, including 4 months for design and 12 months for construction. The construction period for the K1 and K7 lines may or may not occur concurrently. Approximately 110,880 linear feet (21 miles) of existing overhead electrical lines would be replaced on the southwestern portion of South Vandenberg AFB (Figure 1-1). The project area encompasses approximately 216 acres.

Generally, the new overhead electrical lines would be adjacent to existing roads to the extent feasible, and the new lines would deviate from the existing distribution system alignment along some of the route. New poles and electrical equipment would be built within 20 feet of the existing lines that are adjacent to roads. Subsequent to installation of the new lines, the existing lines (i.e., wires, electrical equipment, and poles) would be removed. Some powerlines may be removed utilizing non-invasive removal options due to unstable topography or to minimize environmental impacts, such as unnecessary vegetation removal and soil disturbance.

In environmentally sensitive areas poles would be removed in stages to reduce impacts to the maximum extent feasible. The construction contractor would determine non-invasive removal options. Potential options could include cutting poles into pieces and then manually transporting them to adjacent roads or removing poles by crane.

In order to prevent electrical service interruptions on South Vandenberg AFB, the existing lines would remain operational until installation, testing, and initial operation of the new lines is completed. The new overhead

electrical lines would be maintained by annual inspections.

Feeder Line K1

Existing Feeder Line K1 is located on South Vandenberg AFB. Feeder Line K1 serves several communication facilities on South Vandenberg AFB, many of which are located at high elevations. Therefore, the majority of the existing electrical line traverses hilly terrain and is difficult to access. In several areas, the new electrical lines would be relocated adjacent to existing roads.

Feeder Line K7

Existing Feeder Line K7 is located on South Vandenberg AFB and serves facilities in the vicinity of South Gate. The majority of the existing electrical line is difficult to access due to mountainous terrain. Alternative A would relocate the existing electrical line to more accessible areas. New connections would be provided to facilities currently served by Feeder Line K7 and the existing underground portions of Feeder Line K7. The underground portions of Feeder Line K7 would remain in-place and continue to operate during construction activities.

Modifications to Feeder Lines K1 and K7

The following modifications would occur to Feeder Lines K1 and K7.

- New wood poles would be installed with post insulators for armless construction to eliminate maintenance requirements associated with the existing wood crossarms.
- In areas with difficult access, steel poles would be installed to provide extended service.
- Hardware on new poles would include including guys (a cable designed to add stability to the poles), fused cutouts (device that protects transformers from surges and overloads), surge arresters (device

that protects electrical equipment from surges), and string new aerial conductors (wires that carry an electrical current) on the overhead electrical line.

- All existing aerial conductors and hardware would be removed, including insulators (material that holds conductors in place and blocks the flow of electrical currents) and crossarms (pole-top mounted structure that supports electrical transmission lines). All materials would be disposed of in compliance with the Vandenberg AFB Qualified Recycling Program, ensuring that eligible items are recycled. Non-recyclable ceramic insulators would be transported to the Vandenberg AFB Landfill, crushed and mixed with crushed concrete, and re-used as aggregate. Any transformers containing Polychlorinated biphenyls (PCBs) would be disposed of in accordance with federal and state Environmental Protection Agency (EPA) and Occupational Safety and Health Act (OSHA) regulations and the Vandenberg AFB Hazardous Material Management Plan (30 SWP 32-7086); and Creosote-treated wood poles would be removed and disposed appropriately. Poles that are in good/fair condition would be reused by the Air Force. These poles would be stored at Vandenberg AFB's Materials Diversion Center until they are reused for various projects on Base. Poles that are in poor condition and not suitable for reuse would be disposed of at an appropriate hazardous waste facility in compliance with applicable hazardous waste regulations.
- All new poles would be designed as "raptor safe" and would comply with Avian Protection Plan Guidelines (APLIC 2006).

Site Improvements

Access Roads

The Proposed Action would require re-establishing temporary access roads during demolition and removal of existing lines that would not be replaced in their current alignment. In most areas, temporary access roads would be stabilized in accordance with National Pollutant Discharge Elimination System (NPDES) Construction General Permit requirements (i.e., 70 percent vegetation coverage for exposed soil areas).

New 15-foot wide permanent access roads would be constructed as necessary within the 216-acre maximum disturbance area for new powerlines that are not located near existing roads.

Grading

Site development would require clearing and grading within the 216-acre maximum disturbance area. Grading would be designed to avoid high cut and fill slopes. Slopes would be contoured to the extent possible to provide smooth transitions between the proposed grading and adjacent landforms. Excavated soil would be balanced onsite to the extent feasible. Vegetation removal would be minimized and avoided in surface water drainages. Heavy equipment would be prohibited in surface water drainages.

Staging Areas

Staging areas would be established onsite for equipment, such as tractors, backhoes, and rubber-wheeled trucks, and for supplies, and vehicle parking. Staging areas would be located within existing parking lots, roads, or within areas of invasive plant species (e.g. iceplant) pre-identified by qualified Vandenberg AFB natural resources management personnel and outside of known cultural resources. Staging areas would be used for the temporary storage of excavated soils until the materials could be re-used and/or transported to a designated soil storage area on Vandenberg AFB or an

appropriate offsite disposal facility. Cleared vegetation would be transported to the Vandenberg AFB Landfill.

Disposal of Construction Debris

Demolition of the existing electrical lines and poles would generate construction debris. Hazardous waste could be encountered during demolition activities, such as creosote treated poles. All hazardous waste would be stored, transported, and disposed of in accordance with federal, state, and local regulations. Hazardous waste would be transported to the Consolidated Collection Accumulation Point (CAP) at Building 3300 on Vandenberg AFB. Manifests would be signed by designated Vandenberg AFB staff prior to transporting the waste to a permitted offsite disposal facility.

Operations/Maintenance

The Proposed Action would result in a negligible increase in maintenance activities associated with the proposed overhead electrical lines and permanent access roads. Accordingly, there would be no consequential change in the level of operations/maintenance activities associated with replacing the overhead electrical lines on South Vandenberg AFB.

2.3 Alternative B: Realigned Alternative

This alternative is the same as Alternative A (Proposed Action) except that a segment of the existing line would be abandoned in-place and a portion of the new overhead electrical lines would be realigned to avoid sensitive archaeological resources. The following portions of Feeder Lines K1 and K7 would be realigned as follows.

- One existing pole would be relocated 150 feet away from the Honda Ridge Rock Art site. The pole would no longer be a visual obstacle in front of the rock art site.
- The existing electrical line segment between Clark and Santa Ynez Roads

would be abandoned in-place and operate as an emergency backup system. Abandoning three poles located within an archaeological site and repairing existing hardware, as necessary, would avoid adverse impacts on a National Register of Historic Place (NRHP)-eligible site.

- The proposed route located approximately 4,200 feet east of Arguello Boulevard would be adjacent to an existing road north of the Alternative A route. Feeder Line K1 would be realigned around a NRHP-eligible archaeological site to avoid adverse impacts associated with construction of the new line.
- The proposed route would be adjacent to Spin Road between Coast Road and the eastern end of Spin Road. From the eastern end of Spin Road the route would go north to the Alternative A route. Feeder Line K7 would be realigned around a NRHP-eligible archaeological site to avoid adverse impacts associated with construction of the new line.

2.4 Alternative C: No-Action Alternative

Under the No-Action Alternative, the Proposed Action would not occur and mission operations on South Vandenberg AFB would be subject to unexpected delays due to powerline failures. As discussed in Chapter 1, existing conditions do not provide a reliable power source required to support mission and security operations on South Vandenberg AFB.

The No-Action Alternative is not considered a reasonable alternative because it does not meet the purpose and need of the Proposed Action; however, it provides a measure of the baseline conditions against which the impacts of the Proposed Action can be compared. In this EA, the No-Action Alternative is represented by the baseline conditions described in Chapter 3, Affected Environment.

2.5 Environmental Protection Measures

The following environmental protection measures would be included in both action alternatives, Alternatives A and B. For a comprehensive list of steps the Air Force will employ in order to avoid and/or minimize environmental impacts as well as monitor and report all protection measures, refer to Appendix C.

Air Quality

- Prior to proposed construction, portable equipment meeting the criteria defined in the *Final Regulation Order*, effective 19 February 2011 for the California Portable Equipment Registration Program would be registered in the program or would have a valid Santa Barbara County Air Pollution Control District (SBCAPCD) Permit to Operate.
- Equipment usage and fuel consumption would be documented and reported to 30th Civil Engineering Squadron, Asset Management Flight (30 CES/CEA) to facilitate tracking construction emissions for inclusion in the Vandenberg AFB Air Emissions Inventory.
- Idling of heavy-duty diesel trucks during loading and unloading activities would be limited to five minutes, with auxiliary power units used whenever possible.

The following control measures would be implemented to decrease diesel emissions. Diesel engines operated in California are required to meet California Air Resource Board (CARB) established standards, which may be more stringent than federal mandates.

- Engine size in equipment used for the project would be minimized.
- The use of equipment would be managed to minimize the number of

pieces of equipment operating simultaneously and total operation time for the project.

- Engines would be maintained in tune per manufacturer or operator specification.
- If applicable, United States Environmental Protection Agency (USEPA) or CARB-certified diesel catalytic converters, diesel oxidation catalysts, and diesel particulate filters would be installed.
- When applicable, equipment powered by diesel engines would be retrofitted to meet the Air Toxics Control Measures for Off-Road Vehicles.
- Diesel construction equipment meeting the CARB Tier 1 emission standards for off-road heavy-duty diesel engines would be used, if feasible. Equipment meeting CARB Tier 2 or higher emission standards would be used to the maximum extent feasible.
- If appropriate, diesel powered equipment would be replaced by electric equipment.

Although significant emissions would not occur from the Proposed Action, the following SBCAPCD Rule 345, *Control of Fugitive Dust from Construction and Demolition Activities*, dust control measures would be implemented to further decrease fugitive dust emissions from ground disturbing activities.

- No materials or soil would be loaded onto trucks for transport unless at least one of the following dust prevention techniques is utilized:
 - o Properly secured tarps or cargo covering that covers the entire surface area of the load or a container-type enclosure is used.
 - o Maintain a minimum of 6 inches of freeboard below the rim of the truck bed where the load touches the sides of the cargo area and

ensure that peak loads do not extend above any part of the upper edge of the cargo area.

- o Water the bulk material to minimize the loss of material to wind or spillage.
- o Implement other effective dust prevention control measures approved in writing by the Control Officer.
- Visible roadway dust as a result of active operations, spillage from transport trucks, track-out/carry-out, and/or erosion would be controlled by implementing any of the following measures: track-out grates of gravel beds at each egress point; wheel-washing at each egress point during muddy conditions; soil binders; chemical soil stabilizers; geotextiles; mulching; or seeding.
- Visible roadway dust would be removed at the end of each work day when bulk material removal ceases.

Given the requirements of EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, and the increasing concerns that greenhouse gases (GHGs) contribute to global climate change, the 30 CES/CEA would take into consideration and encourage measures that promote efficiency and conservation through education, programs, and incentives to increase efficiency and conserve energy in projects on Vandenberg AFB.

Biological Resources

- Vandenberg AFB will comply with all terms and conditions and reporting requirements for implementation of the reasonable and prudent measures stipulated in the Biological Opinion issued by USFWS on May 9, 2012 (refer to Appendix B-1 for details). These measures include minimizing the loss of host plants for the EI Segundo blue butterfly and reducing the potential for injury or mortality of

California red-legged frogs in upland areas.

- A qualified biological monitor would conduct pre-project briefings for all workers. A monitor would also be present for the entire first two weeks of the project and would be present for at least one day per week through the remainder of the project as well as in areas specifically determined as sensitive for any species.
- Prior to use on Vandenberg AFB, equipment would be cleaned of all foreign weed seeds and debris. Whenever feasible, equipment would be cleaned between sites, especially following work in areas infested with pampas grass and veldt grass.
- Suitable habitat for the El Segundo blue butterfly would be enhanced at a 2:1 ratio in a nearby area that is not likely to be designated for future development; enhancement includes removal of invasive iceplant (*Carpobrotus* spp.).
- A qualified biologist familiar with California red-legged frog would monitor activities within areas determined sensitive for this species.
- When practicable, project activities would not occur near potential or occupied vernal pool fairy shrimp habitat until the soil is dry to the touch.
- Qualified biologists would designate vernal pool fairy shrimp habitat to be avoided by flagging locations and the area would be protected by placing construction fencing around pools. Construction fencing would be used in locations where construction equipment and/or personnel would be situated adjacent to or in the vicinity of suitable vernal pool fairy shrimp habitat.
- When project activities remove vegetation within designated vernal pool fairy shrimp buffer zones, the

area would be reseeded with a seed mixture approved by a 30 CES/CEAN biologist and invasive plants would be removed at a 1:1 ratio (habitat enhanced: habitat affected) from a nearby buffer area for temporary disturbances and at a 5:1 ratio for permanent disturbances.

- Fill material would not be placed or transported into designated vernal pool fairy shrimp buffer zones.
- Appropriate sedimentation barriers would be placed down-slope of a project site and construction fencing or other appropriate protective fencing would be placed around vernal pools as deemed necessary by the onsite biologist. Fencing would be used in locations where project equipment and/or personnel is situated adjacent to, or in the vicinity of, occupied or potential fairy shrimp habitat.
- If project activities result in the alteration of the hydrological integrity of a vernal pool fairy shrimp buffer zone, the topography would be restored to allow the lateral movement of water to occupied habitats. Altering the topography of occupied habitat would be unlikely; however, if this occurs, the area of impact would be reevaluated for two seasons with at least average rainfall to determine if the effects are permanent or temporary.
- Construction of the Proposed Action would avoid Waters of the U.S., including wetland areas. Potential avoidance methods include installing poles and constructing access roads outside jurisdictional areas and with the assistance of a qualified biological monitor. No vegetation removal would occur in Waters of the U.S. or wetland areas.

Cultural Resources

- Vandenberg AFB will comply with all conditions stipulated in SHPO's concurrence letter dated April 23, 2012 (refer to Appendix B-2 for details). These conditions include archaeological monitoring during construction at cultural sites CA-SBA-2946H and CA-SBA-2412/2941, ensuring construction auger mounted rubber tire trucks use the same route of travel for installation of new poles at sites CA-SBA-2946H and CA-SBA-2412/2941, and installing the new pole at the Honda Ridge Rock Art site (CA-SBA-550) via manual transport or boom-crane.
- Temporary exclusionary fencing would be installed between NRHP-eligible sites and work areas to prohibit vehicular access.
- All construction activities within NRHP-eligible archaeological sites would be monitored by a qualified archaeologist.
- Vehicular access would be prohibited within NRHP-eligible sites. In these areas, poles would be installed by a truck parked on existing roads. Potential pole removal options would include the following: (1) abandoning the poles in place, (2) cutting the poles off at the base and leaving them on the ground, or (3) cutting the poles off at the base and removing the poles from within site boundaries using other methods that do not require vehicular travel across the ground surface.
- In the event that previously undocumented cultural resources are discovered during construction activities, procedures established in the 36 CFR 800.13 and the Vandenberg AFB Integrated Cultural Resources Management Plan would be followed.

Public Health and Safety

- Proper disposal of hazardous waste would be accomplished through identification, characterization, sampling, and analysis of wastes generated.
- All hazardous materials would be properly identified and used in accordance with manufacturer's specifications to avoid accidental exposure to or release of hazardous materials required to operate and maintain construction equipment.
- All equipment would be properly maintained and free of leaks during construction and maintenance activities. All necessary equipment maintenance and repairs would be performed in pre-designated controlled, paved areas to minimize risks from accidental spillage or release. Prior to construction, a Spill Prevention Plan would be submitted to 30th Civil Engineer Squadron, Environmental Flight (30 CES/CEV) for approval.
- Hazardous materials would be procured through or approved by the Vandenberg Hazardous Materials Pharmacy (HazMart). Monthly usage of hazardous materials would be reported to the HazMart to meet legal reporting requirements.
- The Air Force would comply with federal OSHA requirements during construction and annual maintenance activities.
- A Health and Safety Plan would be developed and implemented. In addition, the Air Force would coordinate with the 30th Space Wing Safety-Weapon Safety (30 SW/SEW) prior to implementing the Proposed Action to ensure no adverse effects would occur from unexploded ordnance (UXO) issues. Awareness training would be incorporated into the

worker health and safety protocol to minimize potential adverse impacts from UXO, biological hazards (e.g., snakes and poison oak) and physical hazards (e.g., rocky and unstable terrain).

- All ground disturbing activities in proximity to hazardous release sites would be monitored to minimize the risks of exposure to soil or groundwater contaminants.

Water Resources

- The construction contractor would follow NPDES Construction General Permit requirements including preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP would include Best Management Practices (BMPs) for erosion and sediment control, non-stormwater (wastewater) management, spill prevention and control, vehicle and equipment fueling and maintenance, solid waste management, stockpile management, and septic waste management.
- The construction contractor would adhere to accepted California BMP Manuals such as the California Stormwater Quality Association Manual.
- Construction would avoid wetlands and surface water drainages, including Waters of the U.S. Poles and access roads would be installed outside these areas and vegetation removal would also be avoided. A qualified biological monitor would assist with avoidance of these areas during construction.
- New roads would be designed and constructed to prevent erosion following a BMP manual such as the California Department of Parks and Recreation Off-Highway Vehicle BMP Manual.

- Vegetation removal for temporary access roads would be minimized.

2.6 Other Alternatives Considered

As part of the Air Force's decision-making process two alternatives were considered but not carried forward for detailed analysis as they were determined infeasible since they did not meet the purpose and need of the Proposed Action, as described below.

Alternative Energy Sources

Utilization of alternative energy sources was considered as a potential alternative. Locations on South Vandenberg AFB where solar technologies (e.g., building roof-mounted and ground-mounted solar collectors) could be installed for the generation of electricity were considered. However, these technologies would not produce adequate electricity to provide a reliable power source on South Vandenberg AFB. In addition to solar technologies, onsite generators would be required at the SLCs.

Wind energy technologies were also considered as an alternative power source. Although wind energy technologies are continually improving, this power source would not generate an adequate energy supply. Similar to solar technologies, onsite generators would be required at most facilities to provide a reliable power source.

Time constraints associated with permitting requirements and lease agreements for onsite generators could result in mission delays due to powerline failures. Furthermore, new powerlines would be required to transfer electricity from the generators. Therefore, this alternative would not meet the purpose and need of the Proposed Action and was eliminated from further analysis.

Underground and In-Road Replacement

An alternative was considered that included construction of an underground electrical

system and the subsequent removal of the existing overhead electrical lines. This alternative would install electrical conduits below the surface of the existing roadways. However, due to the substantial cost associated with underground utility replacement, it would be economically infeasible to construct this alternative. Therefore, this alternative was eliminated from further analysis.

2.7 Preferred Alternative

Alternative B is the preferred alternative because it is the only alternative that fulfills the purpose and need for the Proposed Action while avoiding adverse impacts on sensitive archaeological resources.

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Chapter 3. Affected Environment

3.1 Air Quality

Ambient air quality refers to the atmospheric concentration of a specific compound (i.e., amount of a pollutant in a specified volume of air) that occurs in a particular geographic location. Ambient air quality levels at a particular location are determined by the interaction of emissions (e.g., type and amount of pollutant emitted into the atmosphere), meteorology (e.g., weather patterns affecting pollutant emissions), and chemistry (e.g., chemical reactions that transform emissions into other substances). Air quality in a given location is defined by pollutant concentrations in the atmosphere, which are generally expressed in units of parts per million (ppm) or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).

One aspect of significance is a pollutant's concentration in comparison to a national and/or state ambient air quality standard. These standards represent the maximum allowable atmospheric concentrations that may occur and still protect public health and welfare with a reasonable margin of safety. The national standards for seven major pollutants of concern (i.e., criteria pollutants), established by the USEPA, are termed the National Ambient Air Quality Standards (NAAQS).

California standards, established by CARB, are termed the California Ambient Air Quality Standards (CAAQS). CAAQS are at least as restrictive as the NAAQS and include pollutants for which national standards do not exist. In addition to the federal criteria pollutants, California has identified four other pollutants for ambient air quality standards. Areas within California that have ambient air concentrations of a pollutant that are higher than a national and/or state standard are designated as a nonattainment area for that pollutant. Table 3.1-1 summarizes the national and state ambient air quality standards for regulated pollutants.

Toxic air contaminants include air pollutants that can cause serious illnesses or increased mortality, even in low concentrations. Toxic air contaminants are compounds that generally have no established ambient standards, but are known or suspected to cause short-term (acute) and/or long-term (chronic non-carcinogenic or carcinogenic) adverse health effects. The CARB designates diesel particulate matter from the combustion of diesel fuel as a toxic air contaminant.

The main pollutants of concern considered in this air quality analysis include volatile organic compounds (VOCs), ozone (O_3), carbon monoxide (CO), nitrogen oxides (NO_x), particulate matter less than 10 microns in diameter (PM_{10}), and particulate matter less than 2.5 microns in diameter ($\text{PM}_{2.5}$). Although VOCs or NO_x (other than nitrogen dioxide) have no established ambient standards, they are important as precursors to O_3 and $\text{PM}_{2.5}$ formation.

3.1.1 Regional Setting

The climate of the project area is Mediterranean, characterized by warm, dry summers and mild, relatively damp winters. The major influence of the regional climate is the Pacific Ocean and the Eastern Pacific High, a strong persistent atmospheric high-pressure system. Over 90 percent of the total annual precipitation in the project area occurs from polar storm systems that frequent the area during the months of November through April. The average annual precipitation is approximately 14 inches (National Oceanic and Atmospheric Administration 2011). Due to the proximity of the project site to the coastline, marine air from the Pacific Ocean has a strong moderating effect on air temperatures at this location. The high and low temperatures during the summer months average in the low 80s (degrees Fahrenheit) and low 50s, respectively. The high and low temperatures during the winter months average in the mid 60s and high 30s.

Table 3.1-1. National and California Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS ^a Primary Standard ^{b,c}	NAAQS ^a Secondary Standard ^{b,d}	CAAQS
Ozone, O ₃ (ppm)	1 hour	--	--	0.09
	8 hours	0.075	Same as Primary	0.07
Carbon monoxide, CO (ppm)	1 hour	35	None	20
	8 hours	9	None	9
Nitrogen dioxide, NO ₂ (ppm)	1 hour	0.10	--	0.18
	Annual	0.053	Same as Primary	0.03
Sulfur dioxide, SO ₂ (ppm)	1 hour	--	--	0.25
	24 hours	0.14	--	0.04
	Annual	0.03	--	--
Respirable Particulate Matter (PM ₁₀) (μg/m ³)	24 hours	150	Same as Primary	50
	Annual	--	--	20
Fine Particulate Matter (PM _{2.5}) (μg/m ³)	24 hours	35	Same as Primary	--
	Annual	15	Same as Primary	12
Lead, Pb (μg/m ³) ^e	Calendar Quarter	1.5	Same as Primary	--
	Rolling 3-month average	0.15	Same as Primary	--
	30 day average	--	--	1.5
Vinyl chloride (ppm) ^e	24 hour	--	--	0.01
Sulfates (μg/m ³)	24 hour	--	--	25
Hydrogen Sulfide, H ₂ S (ppm)	1 hour	--	--	0.03
Visibility Reducing Particles	8 hour	--	--	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

Source: CARB 2010a.

Notes:

- a Standards other than the 1-hour ozone, 24-hour PM₁₀, 24-hour PM_{2.5}, and those based on annual averages are not to be exceeded more than once a year. The 8-hour ozone national standard has replaced the 1-hour ozone national standard.
- b Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.
- c Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than three years after that states implementation plan is approved by the USEPA.
- d Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- e The CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

-- = no standard

Vandenberg AFB is located within Santa Barbara County, which is within the South Central Coast Air Basin (SCCAB). The SCCAB is composed of the counties of San Luis Obispo, Santa Barbara, and Ventura. The SBCAPCD is responsible for regulating stationary sources of air emissions in Santa Barbara County.

Presently, Santa Barbara County is in attainment/unclassified of all NAAQS for all criteria pollutants. Additionally, Santa Barbara County is in attainment/unclassified of all CAAQS except those for O₃ and PM₁₀ (CARB 2010b). Table 3.1-2 summarizes the county's attainment status.

The CARB and SBCAPCD operate a network of ambient air monitoring stations in Santa Barbara County. The purpose of the monitoring stations is to measure ambient concentrations of air pollutants and determine whether air quality meets the CAAQS and the NAAQS. The nearest air monitoring station to the project site is the Vandenberg AFB station, which measures all criteria pollutants except PM_{2.5}. The only monitoring stations within Santa Barbara County that have monitored PM_{2.5} for the period 2007 through 2009 are located on Broadway Street in Santa Maria and at 700 East Canon Perdido Street in Santa Barbara. The South H Street station in Lompoc measures all criteria

Table 3.1-2. Santa Barbara County Air Quality Attainment Status

O ₃		CO		NO ₂		SO ₂		PM _{2.5}		PM ₁₀	
State	Federal	State	Federal	State	Federal	State	Federal	State	Federal	State	Federal
N	U/A	A	U/A	A	U/A	A	U	U	U/A	N	U

Source: USEPA 2010 and CARB 2010b.
Notes: A=Attainment; N=Nonattainment; U/A=Unclassified/Attainment; U=Unclassified.

pollutants and began monitoring PM_{2.5} in 2007. A summary of the maximum air pollutant concentrations measured within the project region from 2007 through 2009 are presented in Table 3.1-3.

These data show that from 2007 through 2009, the region exceeded the (1) state 8-hour O₃ standard in 2008 and 2009, (2) state annual PM₁₀ standard in 2008 and 2009, (3) state 24-hour PM₁₀ standard in 2009, and (4) national 24-hour PM_{2.5} standard in 2008. The region attained all other air pollutant standards during this period.

3.1.2 Greenhouse Gas Emissions

GHGs are gases that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The accumulation of GHGs in the atmosphere influences the long-term range of average atmospheric temperatures. Scientific evidence indicates a trend of increasing

global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative economic and social consequences across the globe.

Recent observed changes due to global warming include shrinking glaciers, thawing permafrost, a lengthened growing season, and shifts in plant and animal ranges (Intergovernmental Panel on Climate Change 2007). Predictions of long-term environmental impacts due to global warming include sea level rise, changing weather patterns with increases in the severity of storms and droughts, changes to local and regional ecosystems including the potential loss of species, and a significant reduction in winter snow pack. In California, global warming effects are predicted to include exacerbation of air quality problems, a reduction in municipal water supply from the Sierra snowpack, a rise in sea level that

Table 3.1-3. Ambient Air Quality at Vandenberg AFB

Pollutant	Averaging Time	2007	2008	2009	CAAQS (ppm)	NAAQS (ppm)	Monitoring Station
Ozone	8 hour	0.062	0.074	0.074	0.070	0.075	Lompoc ¹
PM ₁₀	Annual Arithmetic Mean	19.6 µg/m ³	20.9 µg/m ³	20 µg/m ³	20 µg/m ³	-	Lompoc ¹
	24 hour	37.8 µg/m ³	47.7 µg/m ³	62 µg/m ³	50 µg/m ³	150 µg/m ³	Lompoc ¹
PM _{2.5}	Annual Arithmetic Mean	9.5 µg/m ³	10.4 µg/m ³	7 µg/m ³	12 µg/m ³	15 µg/m ³	Canon Perdido
	24 hour	23.5 µg/m ³	44.2 µg/m ³	20 µg/m ³	-	35 µg/m ³	Canon Perdido
NO ₂	Annual	0.005	0.003	0.004	0.030	0.053	Lompoc ¹
	1 hour	0.037	0.037	0.03	0.18	-	Lompoc ¹
CO	8 hour	1.18	1.06	0.71	9.0	9	Lompoc ¹
	1 hour	4.6	2.1	1.7	20	35	Lompoc ¹
SO ₂	Annual	0.000	0.000	N/A	-	0.030	Lompoc ¹
	24 hour	0.003	0.002	0.003	0.04	0.14	Lompoc ¹
	3 hour	0.005	0.003	N/A	-	0.5	Lompoc ¹
	1 hour	0.011	0.007	0.008	0.25	-	Lompoc ¹

Sources:

www.arb.ca.gov/adam (for annual NO₂, 8-hour CO, and 24-hour SO₂).
www.epa.gov/air/data/monvals.html (1-hour, 3-hour, and annual SO₂ data).
<http://www.sbcapcd.org/sbc/acrpt.htm>, for O₃, PM, and 1-hour CO and NO₂.

Note:

¹ South H Street

would displace coastal businesses and residences, damage to marine and terrestrial ecosystems, and an increase in the incidence of infectious diseases, asthma, and other human health problems (California Environmental Protection Agency [CalEPA] 2006).

The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydrofluorocarbons and perfluorocarbons) and sulfur hexafluoride. Each GHG is assigned a global warming potential (GWP), which equates to the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to CO₂, which has a value of one. For example, CH₄ has a GWP of 21, which means that it has a global warming effect 21 times greater than CO₂ on an equal-mass basis. Total GHG emissions from a source are often reported as a CO₂ equivalent (CO_{2e}). The CO_{2e} is calculated by multiplying the emission of each GHG by its GWP and adding the results together to produce a single, combined emission rate representing all GHGs.

3.1.3 Applicable Regulations and Standards

Sources of air emissions in the SCCAB are regulated by the USEPA, CARB, and SBCAPCD. In addition, regional and local jurisdictions play a role in air quality management.

Federal Regulations

Clean Air Act

The Clean Air Act (CAA) of 1970 and subsequent amendments specify regulations for control of the nation's air quality. The USEPA is responsible for implementing most aspects of the CAA. Basic elements of the act include the NAAQS for criteria air pollutants, hazardous air pollutant standards, attainment plans, motor vehicle emission

standards, stationary source emission standards and permits, and enforcement provisions. The CAA regulates emissions of criteria pollutants and air toxics to protect human health and welfare.

The CAA delegates the enforcement of the national standards to the states. In California, the CARB is responsible for enforcing air pollution regulations. In Santa Barbara County, the SBCAPCD has this responsibility.

The CAA establishes air quality planning processes and requires areas in nonattainment of a NAAQS to develop a State Implementation Plan that details how the state will attain the standard within mandated time frames. The requirements and compliance dates for attainment are based on the severity of the nonattainment classification of the area.

Executive Order 12088

EO 12088, *Federal Compliance with Pollution Control Standards*, requires federal agencies to comply with applicable pollution control standards. The EO requires agencies to ensure that all necessary actions are taken to ensure the prevention, control, and abatement of environmental pollution with respect to federal activities and facilities. EO 12088 also requires federal agencies to cooperate with USEPA, state, and local regulatory agencies.

Executive Order 13423

EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, was issued in 2007 to set goals in the areas of energy efficiency, acquisition, renewable energy, toxics reductions, recycling, renewable energy, sustainable buildings, electronics stewardship, and water conservation. The EO set a goal to reduce GHG emissions by reducing energy intensity by 3 percent annually or 30 percent by 2015.

Executive Order 13432

EO 13432, *Cooperation Among Agencies in Protecting the Environment with Respect to*

Greenhouse Gas Emissions from Motor Vehicles, Nonroad Vehicles, and Nonroad Engines, ensures the coordination between federal agencies to protect the environment with respect to GHGs emissions from vehicles, engines, and motor vehicle fuels. This EO requires the integration of environmental management into federal operations, policies, planning, and management.

Executive Order 13514

EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, establishes sustainability goals for federal agencies. This EO requires federal agencies to increase energy efficiency, reduce GHG emissions, conserve water, reduce waste, support sustainable development, reduce petroleum consumption, and promote environmentally responsible products and technologies. Federal agencies are required to prepare and implement Strategic Sustainability Performance Plans identifying how they will meet the sustainability goals.

State Regulations

California Clean Air Act

The California CAA of 1988 outlines a program to attain the CAAQS for O₃, NO₂, SO₂, and CO by the earliest practical date. Since the CAAQS are more stringent than the NAAQS, attainment of the CAAQS will require more emission reductions than what will be required to show attainment of the NAAQS. Similar to the federal system, the state requirements and compliance dates are based on the severity of the ambient air quality standard violation within a region. In California, the CARB is designated as the responsible agency for all air quality regulations.

Local Regulations

The SBCAPCD regulates stationary sources of air pollution and establishes emission limitations and control requirements for various sources, based upon their source

type and magnitude of emissions. For example, SBCAPCD Rule 345, Control of Fugitive Dust from Construction and Demolition Activities, establishes limitations on the generation of fugitive dust emissions from construction and demolition sites. The SBCAPCD also implements a permit program for new or modified stationary sources of air pollutants.

3.2 Biological Resources

Federal agencies are required by NEPA and Section 7 of the ESA of 1973, as amended (16 United States Code (USC) §§ 1531 to 1544), to assess the effect of any project on federally listed threatened and endangered species. Under Section 7, consultation with the USFWS and the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (Fisheries Service) is required for federal projects if such actions could directly or indirectly adversely affect listed species or destroy or adversely modify designated critical habitat. It is also Air Force policy to consider listed and special status species recognized by state agencies when evaluating impacts of a project.

Vandenberg AFB is located in a transitional ecological region that lies at the northern and southern distributional limits of many species, and contains diverse biological resources of considerable importance. The Base provides habitat for many federal and state listed threatened, endangered, and special concern plant and animal species.

3.2.1 Methodology

Potential occurrence of plant and wildlife species, including special status species, was determined based on project-specific field surveys conducted in the project vicinity, past documentation of special status species within the project vicinity, suitable habitat preferences, and known occurrence based on literature searches and other existing documentation. Sources used to determine potential occurrence include published literature, regulatory research documents,

and Geographic Information System (GIS) maps of natural resources present at Vandenberg AFB. Special status species survey and location GIS maps were superimposed over the project area and intersecting occupied habitat was documented and/or reviewed.

3.2.2 Vegetation Types

The majority of the project area has been exposed to extensive disturbance from road and facility maintenance activities. Exotic species with the capacity to rapidly colonize disturbed areas dominate much of the project area. A large portion of the new powerlines would be placed within ruderal/roadside habitat and in previously disturbed soils or habitats. Much of these areas have been subjected to extensive disturbance from road and facility maintenance activities. Exotic species with the capacity to rapidly colonize disturbed areas dominate these areas.

Ten distinct vegetation types were identified in the 216-acre project area. With the exception of areas devoted to agricultural fields, the following vegetation types occur as a mosaic throughout the project area: ruderal; non-native grassland; central coast scrub; riparian woodland; maritime chaparral; Bishop pine forest; coast live oak woodland; tan oak woodland; and freshwater marsh.

Vegetation types are described in detail below. Table 3.2-1 lists the approximate percentage of native and non-native species and habitats in the project area.

Ruderal

Ruderal vegetation is found growing adjacent to roads and is typically subjected to frequent disturbance, including mowing. Ruderal vegetation often receives enhanced moisture from road run-off. These areas are

dominated by low growing herbaceous species, most of which are non-native iceplant, annual grasses and forbs. Ruderal vegetation may include seacliff buckwheat. However, repeated disturbances including mowing in most of the project area prevents the maturation and flowering of this species, which prevents it from being suitable for occupancy by the El Segundo blue butterfly.

Agricultural Fields

Agricultural fields are sparsely vegetated due to regular intense disturbances such as mechanical disking. A portion of the existing Feeder Line K7 is located within actively tilled agricultural fields on the south side of Ocean Avenue. Due to an intense maintenance regime, perennial species are absent from these areas. Non-native annual grasses and forbs constitute the majority of vegetation present in these areas.

Non-native Grassland

Non-native grassland occurs most commonly in areas that have been subjected to prior disturbance, such as grazing, allowing weedy non-native species adapted to frequent disturbance to invade and dominate a site. Within some portions of the project area, a near monoculture of iceplant dominates much of the non-native grassland.

Central Coast Scrub

Central coast scrub is the dominant vegetation type found within the project area. This vegetation type is characterized by shallow-rooted, mesophylllic plant species that are often drought-deciduous and summer-dormant. Both the density and composition of the shrub cover vary from site to site, as does the herbaceous understory. Past disturbances have facilitated the establishment of many non-native species such as iceplant within this vegetation type in

Table 3.2-1. Percentage of Native and Non-native Vegetation in Project Area

Feeder Line	Approximate Percentage of Native Species and Habitats	Approximate Percentage of Non-native or Ruderal Species and Habitats
K1	72	28
K7	51	49

some areas. However, most areas where non-natives are dominant are discussed above. Dominant species vary significantly with environmental factors such as geographic location, nature of habitat, and degree of disturbance. Species composition ranges from pure stands of coyote brush or purple sage to a mosaic of species including black sage, deerweed, California sagebrush, seaciff buckwheat, and/or sticky monkey flower. Central coast scrub communities also intergrade gradually with other vegetation types within the project area including maritime chaparral. Central coast scrub forms successional stages in maritime chaparral following fire or other disturbances such as land clearing. Herbaceous species such as grassland tarplant may be present in clearings between shrubs.

Riparian Woodland

Riparian woodland is a dense, low, closed-canopy, broad-leafed winter-deciduous riparian forest. Arroyo willow dominates this vegetation type within the project area.

Freshwater Marsh

Freshwater marsh occurs in nutrient rich mineral soils that are inundated or saturated adjacent to Ocean Avenue. Dominant plant species include herbaceous monocots such as sedges, spike-rushes, rushes, tules, bur-reed and cattails, which are generally found in monotypic stands. La Graciosa thistle was collected from this vegetation type near the project area in the 1950's.

Maritime Chaparral

Maritime chaparral is a dense, evergreen, rigid, fire-adapted form of shrubby vegetation unique to California's coastal areas. Chaparral provides valuable wildlife habitat and is important in providing vegetative cover that controls erosion, especially on steep slopes and ridges. Burton mesa chaparral is a type of maritime chaparral characterized by endemic species of manzanita (La Purisima manzanita and sand mesa manzanita) and Santa Barbara lilac. It occurs on acidic substrates including stabilized sand, granite, and metamorphosed

rock types found within the project area. Unusual multi-trunked coast live oaks are scattered in much of the Burton Mesa chaparral near Manzanita and Arguello roads.

Bishop Pine Forest

Bishop pine forest is dominated by Bishop pine, which is a closed cone species. It occurs primarily in dense stands on the northern slopes of the Santa Ynez Mountains along the Feeder Line K1 near Arguello Road. The Bishop pine understory is comprised largely of shrubs typical of maritime chaparral in the open areas, including La Purisima manzanita and sand mesa manzanita, and sparse understory of primarily bracken fern in the denser areas.

Coast Live Oak Woodland

Coast live oak woodland occurs where the Feeder Line K1 crosses Cañada Honda Creek and other seasonal drainages. The dominant overstory species in these woodlands is coast live oak.

Tan Oak Woodland

Tan oak woodland occurs near the end of Honda Ridge Road within the project area. Tan oak is an evergreen tree that forms dense woodlands in this area and grades into central coastal scrub. Understory vegetation is very sparse and varies from grasses to herbs and shrubs.

3.2.3 Wildlife Species

The vegetation types present within the project area provide habitat for many wildlife species, including but not limited to birds commonly associated with coastal scrub and grassland vegetation including house finch, European starling, and western scrub-jay. Nesting native birds such as spotted towhees and wrentit would also be expected to utilize these sites.

Pacific treefrog are likely to be the most common amphibian species within the project area, but California red-legged frog, western toad, and others could also be present. The California red-legged frog is federally listed as

threatened and a California Species of Concern (refer to Section 3.2.4).

Reptile species expected within the project area include western fence lizard, southern alligator lizard, western skink, San Diego gopher snake, southern pacific rattlesnake, and coast horned lizard.

A variety of mammal species are also expected to occur within the project area. These include brush rabbit, coyote, and black-tailed deer. Small mammals include various species of mice and valley pocket gopher.

3.2.4 Special Status Species

Table 3.2-2 lists the federal and state threatened and endangered species and other special status species that occur or have the potential to occur in the project area.

Three special status species, El Segundo blue butterfly (listed as federally endangered), California red-legged frog (listed as federally threatened and a California Species of Concern), and vernal pool fairy shrimp (listed as federally threatened) are known to occur within the project area. Project specific surveys for Gaviota tarplant (listed as federally and state endangered) were completed in the project area and no occurrences were identified in the vicinity of Feeder Lines K1 and K7.

Seacliff buckwheat, the host plant for the federally endangered El Segundo blue butterfly, occurs within the project site in areas dominated by iceplant, within central coast scrub, and in areas of higher elevation areas. Seacliff buckwheat is the host plant for

El Segundo blue butterfly and large portions of the project area were surveyed for the presence of seacliff buckwheat and El Segundo blue butterfly on several different dates in all years between 2007 and 2010. Based on these surveys, a portion of the Feeder Line K1 is less than 0.1 mile from the nearest documented occurrence of the El Segundo blue butterfly on Vandenberg AFB. However, due to the occurrence seacliff buckwheat (the host plant for the El Segundo blue butterfly) within the project area, the entire project area was determined to constitute potential habitat.

California red-legged frog

The California red-legged frog is the largest native frog in the western U.S. It once ranged across much of California, including portions of the Sierra Nevada Mountain Range. The present distribution ranges from Sonoma and Butte Counties (in the north) to Riverside County (in the south), where they occur primarily in wetlands and streams in coastal drainages of central California. The USFWS listed this species as federally threatened on May 23, 1996 (61 FR 25813).

The USFWS designated critical habitat for the California red-legged frog on March 13, 2001(66 FR 14626). Several revisions to critical habitat have occurred, and been proposed. Vandenberg AFB was excluded from the critical habitat designation under section 4(b)(2) of the ESA. The Final Rule for Revised Designation of Critical Habitat published on March 17, 2010 (75 FR 12816) also exempted Vandenberg AFB from critical habitat designation under section 4(b)(2) of the

Table 3.2-2. Special Status Plant and Wildlife Species within the Project Area

Scientific Name Common Name	Status		Occurrence	Habitat	Comments
	USFWS ¹	CDFG ²			
Amphibians					
California red-legged frog	FT	CSC	Documented	Perennial ponds and streams	Breeds February - April
Invertebrates					
El Segundo blue butterfly	FE		Documented	Coastal sand dunes	Adult flight period June – September
Vernal pool fairy shrimp	FT		Documented	Vernal pools	Life Span: December to early May (if water stays below 75° F).
Notes: 1 FE = Federal Endangered Species; FT = Federal Threatened Species 2 SE = California Endangered Species; CSC = California Species of Concern					

ESA. As a result, the Proposed Action is not in critical habitat for California red-legged frog.

California red-legged frogs have the potential to occur in nearly all permanent streams and ponds on Vandenberg AFB (Christopher 2002). California red-legged frogs occur in different habitats depending on their life stage, the season, and weather conditions. All life stages are most likely to be encountered in and around breeding sites, which are known to include coastal lagoons, marshes, springs, permanent and semi-permanent natural ponds, ponded and backwater portions of streams, as well as bodies of water confined within an enclosure such as stock ponds, irrigation ponds, and siltation ponds. Dense, shrubby, or emergent vegetation closely associated with deep-water pools with fringes of cattails and dense stands of overhanging vegetation such as willows are considered optimal breeding habitat. California red-legged frogs breed from November to April, usually laying egg masses during or shortly following large rainfall events from late December to late April.

California red-legged frogs require aquatic habitat for breeding and cover but also use a variety of other habitat types including riparian and upland areas during periods of wet weather, starting with the first rains of fall. Yearly rainfall patterns may affect the breeding season duration in perennial streams on Vandenberg AFB due to the availability of deep water pools. Areas not suitable for breeding may function as foraging habitat or refuge for dispersing frogs. California red-legged frogs often disperse from their breeding habitat as water levels fall below approximately 1 meter, finding cover in upland areas under brush. Adult frogs that have access to permanent water will generally remain active throughout the year. California red-legged frogs are known to disperse as far as 1.8 miles from breeding habitat (Bulger et al. 2003).

The primary areas of concern for the project area as related to this species include Cañada Honda Creek, Bear Creek,

wastewater holding areas near SLC-6, and the channelized stream and pools adjacent to Ocean Avenue near the project area. However, the proposed action does not include activity in standing or flowing water that would provide habitat for eggs or juveniles.

El Segundo blue butterfly

The El Segundo blue butterfly was listed by the USFWS as federally endangered on June 1, 1976 (41 FR 22041). The El Segundo blue butterfly occurs in coastal dune scrub habitat, along coastal bluffs, and in coastal scrub habitats. The adult flight period is generally from mid-June through late August or early September, and coincides with the blooming period of its host plant, seaciff buckwheat (Arnold 1978, 1983; Pratt and Ballmer 1993). Eggs are deposited on buckwheat flowers and buds where the larvae feed until maturation. Upon maturation larvae burrow into the soil and pupate, usually within the root and debris zone of the host plant (Mattoni 1992). Pupae remain in diapause until at least the following flight season. The number of adult butterflies that emerge in a given year is dependent on environmental conditions. The majority of the pupae may remain in diapause if environmental conditions are not favorable (Pratt and Ballmer 1993).

The occurrence of El Segundo blue butterflies at Vandenberg AFB represents a significant extension of the butterfly's geographic range. It was originally thought to be restricted to remnant habitat patches from Playa del Rey to the Palos Verdes Peninsula in Los Angeles County, California (Arnold 1978, 1981).

The El Segundo blue butterfly has been documented at four locations on Vandenberg AFB, including Tranquillon Peak, along north Spur Road (near San Antonio Creek and the railroad overpass), and near south Spur Road (west of the Taurus launch facility) (Pratt 2006). Additionally, a single El Segundo blue butterfly was detected near the intersection of Coast Road and Bear Creek Road in summer 2008 (unpublished data). The species was

generally found in coastal back dune habitats and central coast scrub.

Large portions of the project area were surveyed for the presence of seacliff buckwheat and El Segundo blue butterfly on several different dates during 2007-2010. Based on these surveys, a portion of Feeder Line K1 is within occupied habitat for the El Segundo blue butterfly parallel to Honda Ridge Road. In addition, a single El Segundo blue butterfly was documented approximately 2 miles south of Feeder Line K7. However, due to the occurrence of the host plant for the El Segundo blue butterfly, seacliff buckwheat, within the other portions of the project area, the entire action area was determined to constitute potential habitat.

Vernal pool fairy shrimp

The vernal pool fairy shrimp was listed as federally threatened on September 19, 1994 (59 FR 48136). Critical habitat was designated on August 6, 2003 (68 FR 46684), but was remanded on November 2, 2006. The court ordered USFWS to reconsider its decision and issue a new critical habitat rule. During this time, the existing critical habitat will remain in place. Vernal pool fairy shrimp were not known to occur on Vandenberg AFB at the time and were not included in the critical habitat designation.

The vernal pool fairy shrimp is a small freshwater crustacean. The vernal pool fairy shrimp has an ephemeral life cycle and exists only in vernal pools or vernal pool-like habitats; the species does not occur in riverine, marine, or other permanent bodies of water. When the temporary pools dry, offspring persist in suspended development as cysts in the pool substrate until the return of winter rains and appropriate temperatures allow some of the cysts to hatch (Eriksen and Belk 1999). The time to maturity and reproduction is temperature dependent, varying between 18 days and 147 days, with a mean of approximately 40 days (Helm 1998). Individuals hatch from cysts during cold-weather winter storms; they require water temperatures of 50 degrees Fahrenheit

(Helm 1998) or lower to hatch (Helm 1998; Eriksen and Belk 1999). Fairy shrimp cysts are capable of withstanding heat, cold, fire, and prolonged desiccation and may persist in the soil for an unknown number of years until conditions are favorable for successful hatching. Not all cysts are likely to hatch in a season, thus providing a mechanism for survival if the inundation period is too short in a given year.

Maintaining the integrity of surrounding upland habitat is critical to the proper ecological functioning of vernal pool fairy shrimp habitat. Habitat loss and fragmentation are the largest threats to the survival and recovery of vernal pool fairy shrimp and other species restricted to vernal pool and other ephemeral wetland habitats. Habitat loss can occur in the form of habitat alteration and degradation as a result of changes to natural hydrology and competition from invasive species.

The vernal pool fairy shrimp is endemic to California and the Agate Desert of southern Oregon. This species was documented on Vandenberg AFB in 2004. Protocol-level surveys were conducted between November 2004 and April 2006 in 222 wetlands and wetland complexes capable of supporting this species and other dependent species (SRS Technologies 2006). Approximately 612 acres of potential habitat have been surveyed, resulting in the delineation of 82 acres of occupied habitat on both North and South Vandenberg AFB. In addition, it is estimated that protocol-level surveys have not been conducted in approximately 15 acres of potential habitat because these areas were not identified until after the 2005 surveys. These areas will be protected as occupied habitat until protocol-level surveys can be conducted to determine the presence or absence of vernal pool fairy shrimp.

Approximately 5,000 linear feet of the new Feeder Line K1 would occur near known occupied vernal pools, within hydrologically connected areas adjacent to Arguello Road. The new Feeder Line K7 would occur near

three potential vernal pools that have not been sampled and one known to be occupied, within hydrologically connected areas adjacent to Ocean Avenue, Coast Road, and Spin Road.

Other Special Status Species Considered

Other special status species considered include La Graciosa thistle, beach layia, Lompoc yerba santa, and Gaviota tarplant.

La Graciosa Thistle [*Federally Endangered Species*] historically occurred approximately 360 feet north of Feeder Line K7 near the riparian edge adjacent to an agricultural field in 1958 (Smith 1983). This species has not been documented on Vandenberg AFB since the 1958 collection and was not found during project-specific surveys conducted in August and September 2011. Therefore, this species would not be affected by project activities.

Beach Layia [*Federally Endangered Species*] occurs in coastal dune scrub approximately 1.6 miles south of the project area. This species has not been documented within the project area. Therefore, this species would not be affected by project activities.

Lompoc Yerba Santa [*Federally Endangered Species*] has the potential to occur in chaparral, coastal sage scrub, and Bishop Pine forest on Vandenberg AFB. This species has not been documented within the project area and was not found during project-specific surveys conducted in August and September 2011. Therefore, this species would not be affected by project activities.

Gaviota Tarplant [*Federally Endangered Species*] is known to be present approximately 0.5 mile south of Feeder Line K1. Project-specific surveys for this species were conducted in August and September 2011, to coincide with the blooming period. Gaviota tarplant has not been documented within the project area and was not found during the 2011 surveys; therefore this species would not be affected by proposed activities.

3.2.5 Waters of the U.S. and Wetlands

Under Section 404 of the Clean Water Act (CWA), wetlands are defined as 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 (USEPA, 40 CFR 230.3 and United States Army Corps of Engineers [USACE], 33 CFR 328.3). Waters of the U.S. most commonly encompass navigable waters bound by the ordinary high water line, adjacent wetlands, and relatively permanent tributaries. EO 11990, *Protection of Wetlands*, dated May 24, 1977 and amended by EO 12608 on September 9, 1987, requires federal agencies to minimize the destruction, loss, or degradation of wetlands and to enhance their natural and beneficial values.

No project-specific wetland delineation surveys were conducted for the Proposed Action. However, based on review of aerial photos and understanding of the project area, it is likely the drainage features that traverse the project site could be considered jurisdictional by the USACE and other Waters of the U.S.

The Santa Ynez River and Cañada Honda Creek and are the main tributaries in the project area that flows directly to the ocean. The Santa Ynez River, located beyond West Ocean Avenue, north of the project area, is a substantial drainage in the project area that flows directly to the Pacific Ocean. Cañada Honda Creek, located north of Honda Ridge Road, is a second substantial drainage in the project area that flows directly to the Pacific Ocean. Lompoc Canyon (tributary to Santa Ynez River) and Red Roof Canyon (tributary to Cañada Honda Creek) are small drainages that traverse the project site. Several unnamed, small drainages that are tributary to Cañada Honda Creek also traverse the project site.

3.3 Cultural Resources

Cultural resources are districts, buildings, sites, structures, areas of traditional use, or objects with historical, architectural, archeological, cultural, or of scientific importance. They include archeological resources (both prehistoric and historic), historic architectural resources (physical properties, structures, or built items), and traditional cultural properties (those important to living Native Americans for religious, spiritual, ancestral, or traditional reasons).

The NHPA establishes national policy for protecting significant cultural resources that are defined as “historic properties.” The term “historic property” refers to any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the NRHP (36 CFR Part 800.16).

3.3.1 Area of Potential Effects

The Area of Potential Effects (APE) of an undertaking is defined at 36 CFR 800.16(d) as “the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist.” The APE for the Proposed Action was defined as a 200 foot wide corridor, centered on the power line alignment.

3.3.2 Cultural Setting

The prehistory of California’s central coast spans the entire Holocene (the last 11,000 years) and may extend back to late Pleistocene times (which began about 1.6 million years ago and ended about 11,000 years ago). Excavations on Vandenberg AFB reveal occupations dating back 9,000 to 10,000 years (Glassow 1990, 1996; Lebow et al. 2001, 2006, 2007). These early occupants are thought to have lived in small groups that had a relatively egalitarian social organization and a forager-type land-use strategy (Erlandson 1994; Glassow 1996; Greenwood 1972; Moratto 1984). Human population density was low throughout the early and middle Holocene (Lebow et al. 2007).

Cultural complexity appears to have increased around 3,000–2,500 years ago (King 1981, 1990). At Vandenberg AFB, that interval also marks the beginning of increasing human population densities and appears to mark the shift from a foraging to a collecting land-use strategy (Lebow et al. 2006, 2007). Population densities reached their peak around 600–800 years ago, corresponding to the full emergence of Chumash cultural complexity (Arnold 1992).

People living in the Vandenberg AFB area prior to historic contact are grouped with the Purisimezo Chumash (Greenwood 1978; King 1984; Landberg 1965), one of several linguistically related members of the Chumash culture. In the Santa Barbara Channel area, the Chumash people lived in large, densely populated villages and had a culture that “was as elaborate as that of any hunter-gatherer society on earth” (Moratto 1984). Relatively little is known about the Chumash in the Vandenberg AFB region. Explorers noted that villages were smaller and lacked the formal structure found in the channel area (Greenwood 1978:520). About five ethnohistoric villages are identified by King (1984) on Vandenberg AFB, along with another five villages in the general vicinity. Diseases introduced by early Euroamerican explorers, beginning with the maritime voyages of Cabrillo in A.D. 1542–1543, substantially impacted Chumash populations more than 200 years before Spanish occupation began (Erlandson and Bartoy 1995, 1996; Preston 1996). Drastic changes to Chumash lifeways resulted from the Spanish occupation that began with the Portolá expedition in A.D. 1769.

Vandenberg AFB history is divided into the Mission, Rancho, Anglo-Mexican, Americanization, Regional Culture, and Suburban periods. The Mission Period began with the early Spanish explorers and continued until 1820. Mission La Purísima encompassed the Vandenberg area. Farming and ranching were the primary economic activities at the Mission. The Rancho Period began in 1820 and continued until 1845.

Following secularization in 1834, the Alta California government granted former mission lands to Mexican citizens as ranchos. Cattle ranching was the primary economic activity during this period. The Bear Flag Revolt and the Mexican War marked the beginning of the Anglo-Mexican Period (1845–1880). Cattle ranching continued to flourish during the early part of this period, but severe droughts during the 1860s decimated cattle herds. The combination of drought and change in government from Mexican to the U.S. caused substantial changes in land ownership. Sheep ranching and grain farming replaced the old rancho system. Increased population densities characterize the Americanization Period (1880–1915). Beginning in the late 1890s, the railroad provided a more efficient means of shipping and receiving goods and supplies, which in turn increased economic activity. Ranching and farming continued during the early part of the period of Regional Culture (1915–1945), until property was condemned for Camp Cooke.

The Suburban Period (1945–1965) began with the end of World War II. In 1956, the army transferred 64,000 acres of North Camp Cooke to the Air Force, and it was renamed Cooke AFB. Construction of missile launch complexes began in 1957 and in 1958 the Base had its first missile launch, the Thor, and was renamed Vandenberg AFB (Palmer 1999). The Base played a very important role in the Cold War, with every ballistic missile in the U.S. arsenal ground- and flight-tested at Vandenberg AFB and thousands of military personnel receiving training under operational conditions. In addition, the Base was the only place where military satellites could be safely launched into polar orbit and thus proved critical to the military space program during the Cold War (Nowlan et al. 1996).

3.3.3 Cultural Resources within the Project Area

An archaeological site record and literature search for Feeder Lines K1 and K7 was completed at the 30th Civil Engineer Squadron, Asset Management Flight, Natural

Resources Management (30 CES/CEANC) at Vandenberg AFB. Background research included a review of archaeological literature, archaeological base maps, and cultural resource records. Previous archaeological studies and archaeological resources within a 200-foot wide corridor centered on the power line alignment were identified during the record search. Data sources examined included the Base Comprehensive Plan GIS and U.S. Geological Survey topographic maps.

Feeder Lines K1 and K7 cross an area of high archaeological site density; a search of the archaeological study area identified 16 sites (Table 3.3-1) and five isolated artifacts.

Most archaeological sites within the project area are prehistoric or have prehistoric components, including rock art, short-term residences, and special-use locations for gathering and/or processing resources. Historical sites include ranchsteads and a military landfill. Isolated artifacts within the proposed Feeder Line K7 include a projectile point (ISO-128), a core (ISO-130), and a flake (ISO-706). A cluster of three flakes (ISO-249) and an unidentified isolated artifact (ISO-443) are within the existing Feeder Line K1. Site significance (i.e., eligibility for the NRHP) has not been evaluated for seven of the 16 sites; for purposes of the Proposed Action all seven are assumed to be significant. Three sites have been officially determined eligible for the NRHP, in consultation with the SHPO, and six have been determined ineligible.

3.4 Geology and Earth Resources

Vandenberg AFB is situated along the coastline in the Santa Maria basin. Vandenberg AFB is a geologically complex area that includes the transition zone between the Southern Coast Range (on the northeast) and Western Transverse Range (on the south) geomorphic provinces. Extensive geological activity in the Vandenberg AFB region has created four structural regions: the Santa Ynez Range; the Lompoc lowland; the Los Alamos

Table 3.3-1. Archaeological Sites within the Study Area

Site CA-SBA-	Site Type ¹ /Description	Feeder Line	NRHP Eligibility ²	Archaeological Studies Beyond Recordation
550	Residential/ Ideological, Honda Ridge Rock Art	K1	Eligible	Benson 1969; Bury et al. 2002; Hyder et al. 1996.
923	Short-term residence	K7	Unevaluated	Carbone and Mason 1998; Enright et al. 2012; Spanne 1980.
927H	Debris scatter, Long/Colli Dairy remains	K7	Unevaluated	Carbone and Mason 1998; Enright et al. 2012.
931	Short-term residence	K7	Eligible	Carbone and Mason 1998; Enright et al. 2012; Glassow et al. 1976; King et al. 1985; Peterson, et al. 1984.
932	Location, chipping station	K7	Ineligible ³	Carbone and Mason 1998; Enright et al. 2012; Glassow et al. 1976; Peterson et al. 1984.
1130	Location, chipping station	K7	Unevaluated	Carbone and Mason 1998; Enright et al. 2012; Glassow et al. 1976.
2412/2941	Location, chipping station	K7	Eligible	Glassow et al. 1976; Lebow et al. 2002; Peterson et al. 1984.
2446	Location, chipping station	K7	Ineligible	WESTEC 1984, 1985.
2829	Location, chipping station	K1	Ineligible	Carbone and Mason 1998; Enright et al. 2012; Lebow et al. 2004
2831	Quarry	K1	Unevaluated	Carbone and Mason 1998; Enright et al. 2012.
2834	Quarry	K7	Ineligible	Carbone and Mason 1998; Enright et al. 2012; Environmental Solutions 1988; Ferraro et al. 1988.
2836	Location, chipping station	K7	Ineligible	Carbone and Mason 1998; Enright et al. 2012; Neff and Snethkamp 1982; WESTEC 1984, 1985.
2946H	Debris scatter, historic debris scatter	K7	Unevaluated	Carbone and Mason 1998; Enright et al. 2012; Glassow et al. 1976; Jaffke 1990; King et al. 1985.
2952	Location, chipping station	K7	Unevaluated	Carbone and Mason 1998; Enright et al. 2012.
3107H	Debris scatter, historic debris scatter	K7	Unevaluated	Carbone and Mason 1998.
4009H	Debris scatter, Military landfill	K7	Ineligible	Carbone and Mason 1998; Enright et al. 2012; Environmental Solutions 1988; Ferraro et al. 1988.
Notes: 1 Site type from Volume 5 of Vandenberg AFB's Integrated Cultural Resources Management Plan (Lebow and Moratto 2005). 2 NRHP = National Register of Historic Places. Eligible or ineligible refers to a formal determination of NRHP eligibility in consultation with the California SHPO. All unevaluated sites are assumed to be eligible for the NRHP. 3 Previously determined eligible but reevaluated as ineligible. ¹				

syncline; and the San Rafael Mountain uplift. Vandenberg AFB is characterized by generally northwest trending ridges and valleys. Major geologic features within Vandenberg AFB include the Santa Ynez Mountains, Casmalia Hills, Purisima Hills, Santa Ynez Valley Dune Complex, Sudden Flats, beaches, and rocky headlands. The Santa Ynez River and San Antonio Creek are the two major drainages that traverse Vandenberg AFB.

The near-surface geology along the northern portion of the Feeder Line K1 consists of Orcutt Sand, comprised primarily of soft sand, with localized areas of hard sand and pebbles, as well as hard, brittle, Monterey Shale deposits. The eastern portion of the Feeder Line K1 is underlain by shale and sandstone deposits of the Monterey Shale, Rincon Shale, Vaqueros Sandstone, Gaviota-Sacate Sandstone, Cozy Dell Shale, Matilija

Sandstone, Anita Shale, Espada Shale, and Honda Shale. Localized alluvium and landslide deposits are present within areas of Cozy Dell Shale. The western portion of the Feeder Line K1 is underlain by volcanic rocks of the Tranquillon Formation, as well as Rincon Shale, Monterey Shale, and older alluvium, consisting of silt, sand, and gravel (Dibblee 1988).

The near-surface geology along the coastal portion of the Feeder Line K7 consists of Pleistocene older dune sand deposits and Monterey Shale deposits. Inland from the coast, the alignment traverses Holocene alluvium, consisting of silt, sand, and gravel; and Pleistocene Orcutt Sand, consisting primarily of soft sand, with localized areas of hard sand and pebbles (Dibblee 1988).

3.4.1 Soils

Vandenberg AFB is characterized by coastal sand dunes and alluvium (i.e., sediment deposited by flowing water). Vandenberg AFB is underlain predominately by marine sedimentary rocks (e.g., shales and limestone) of Late Mesozoic period (140 to 70 million years before the present) and Cenozoic period (70 million years to the present). Basement rocks underlying Vandenberg AFB is the Franciscan Formation, which consists of a series of sedimentary and volcanic rocks (Dibblee 1950).

The coastal portion of Feeder Lines K1 and K7 are underlain by Marian-Oceano association soils, consisting of nearly level to moderately steep, somewhat excessively drained and excessively drained sands, on mesas and dunes. The more inland portions of the alignments are underlain by Shedd-Santa Lucia-Diablo association soils, consisting of strongly sloping to very steep, well-drained shaly clay loams and silty clays on uplands (Vandenberg AFB 2011; USDA Soil Conservation Service 1972).

3.4.2 Faulting and Seismicity

The California Geological Survey (CGS), formerly known as the California Division of Mines and Geology (CDMG), classifies faults as either active or potentially active, according to the Alquist-Priolo Special Studies Zone Act of 1972. A fault that has exhibited surface displacement within the Holocene Epoch (the last 11,000 years) is defined as active by the CGS. A fault that has exhibited surface displacement during the Pleistocene Epoch (which began about 1.6 million years ago and ended about 11,000 years ago) is defined as potentially active. Pre-Pleistocene faults are considered inactive. The CGS has established Alquist-Priolo Special Study Zones around faults identified by the State Geologist as being active. The Alquist-Priolo Special Studies Zone Act limits development along the surface trace of active faults to reduce the potential for structural damage and/or injury

due to fault rupture. The CGS also suggests that active faults, located within a 60-mile radius of a project site, be evaluated with respect to regional seismicity (CDMG 1999, 1994).

Santa Barbara County is a seismically active region with a major earthquake occurring in the region about every 15 to 20 years (USAF 1987; Alterman et al. 1994). Two potentially active faults traverse the northern portion of the project area for the Feeder Line K1, including the Honda and Santa Ynez River faults. In addition, an unnamed potentially active fault, which is a splay of the Santa Ynez River Fault, traverses the project area for the Feeder Line K7 (Jennings 1994). Each of these faults is capable of causing ground surface rupture or seismically induced ground shaking; however, the likelihood of those events occurring during the lifespan of the electrical lines is very low. Two active fault zones that would be more likely to cause ground motion or produce secondary effects traverse Vandenberg AFB, including the Santa Ynez-Pacifico and Lions Head-Los Alamos-Baseline fault zones, and associated potential offshore extensions (Alterman et al. 1994; Jennings 1994).

3.4.3 Geologic Hazards

Three potentially active faults traverse the project site; however, the potential for surface fault rupture is low. The primary geologic hazard at the project site is strong seismically induced ground shaking. There are no known areas within the project area where liquefaction has occurred. The areas most prone to liquefaction on Vandenberg AFB are near San Antonio Creek and the Santa Ynez River. The potential for liquefaction on Vandenberg AFB, despite these areas, is considered low (USAF 1987).

3.5 Land Use and Coastal Zone Resources

Vandenberg AFB is located on approximately 99,100 acres along the coastline in Santa Barbara County (Figure 1-1). Situated within

an unincorporated part of the county, Vandenberg AFB is located northwest of the City of Santa Barbara and south of the City of San Luis Obispo. Although the project site is located within Santa Barbara County, the local government does not have any jurisdictional authority over land use on Vandenberg AFB because it is a federal military facility. General land uses at Vandenberg AFB include administrative, AETC (space and missile training area), agriculture/grazing, airfield, community (commercial and service), housing, industrial, launch operations, medical, open space, outdoor recreation, and water/coastal (Vandenberg AFB 2009).

The project site is situated throughout South Vandenberg AFB between Point Arguello and West Ocean Avenue. The surrounding area is predominately undeveloped with the exception of launch operation support facilities associated with SLC-6, and utility infrastructure (e.g., existing electrical distribution lines and Substation K/power plant), the Spin Test Support Facility, and miscellaneous uses along Mesa Road and Clark Street. Surrounding land uses to the north, east, west, and south include agricultural/grazing and open space interspersed with areas of industrial and community services uses.

Coastal Zone Management

Coastal Zone Management Act

In 1972, Congress passed the CZMA to “preserve, protect, develop, and where possible, to restore or enhance, the resources of the nation’s coastal zone for this and succeeding generations” and to “encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone” [16 U.S.C. 1452, Section 303(1) and (2)].

The Proposed Action is subject to a federal Coastal Zone Consistency Review because it would involve activities within the coastal zone

of California. On Vandenberg AFB, the coastal zone extends inland from approximately 0.75 miles at the northern boundary to 4.5 miles at the southern boundary. California has a federally approved Coastal Management Program, which includes the California Coastal Act (CCA).

The Air Force submitted a Negative Determination letter to the CCC on April 18, 2012 indicating that replacing electrical line Feeders K1 and K7 would not affect natural, cultural and paleontological resources, access to the coast, or coastal scenic and visual qualities. Since the Proposed Action would not affect the coastal zone, the Air Force concluded the action does not require a consistency determination.

The Air Force submitted a Negative Determination letter to the CCC on April 20, 2012 indicating that replacing electrical line Feeders K1 and K7 would not affect natural, cultural and paleontological resources, access to the coast, or coastal scenic and visual qualities. The CCC concurred with Vandenberg AFB’s determination in a letter dated July 9, 2012 (refer to Appendix B-4 for details).

3.6 Noise

The Noise Control Act (42 USC 4901 *et seq.*) limits the exposure and disturbance that individuals and communities experience from noise. It focuses on surface transportation and construction sources, particularly near airport environments. The Noise Control Act also specifies that performance standards for transportation equipment be established with the assistance of the Department of Transportation. In addition, the 1987 Quiet Community amendment gives state and local authorities greater involvement in controlling noise.

3.6.1 Noise Characteristics

Noise is commonly defined as unwanted sound. Sound is defined as pressure variations in air that the human ear can detect. The nature of sound can be characterized by its pitch or its loudness. Pitch is the height or depth of a tone or

sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Loudness is the amplitude of sound waves combined with the reception characteristics of the ear. Technical acoustical terms commonly used in this section are defined in Table 3.6-1.

3.6.2 Sound Level and Frequency

Several noise measurement scales are used to describe noise. The decibel (dB) is a unit of measurement that indicates the relative amplitude of a sound. Zero on the dB scale is based on the lowest sound pressure that a healthy, unimpaired human ear can detect. Sound levels in dBs are calculated on a logarithmic basis. An increase of 10 dB represents a 10-fold increase in acoustic energy, while 20 dB is 100 times more intense, 30 dB is 1,000 times more intense. There is a relationship between the subjective noisiness or loudness of a sound and its level. Each 10-dB increase in sound level is perceived as approximately a doubling of loudness over a wide range of amplitudes. Since dB is a logarithmic unit, sound pressure levels are not added arithmetically. When two sounds of equal sound pressure level are added, the result is a sound pressure level that is 3 dB higher. For example, if the sound level were 70 dB when 100 cars pass by in a certain time period, then it would be 73 dB if 200 cars pass the observer during the same period. Doubling the amount of energy would result in a 3 dB increase to the sound level.

Frequency relates to the number of pressure oscillations per second, or Hertz (Hz). The range of sound frequencies that can be heard by healthy human ears is from about 20 Hz at the low end of the frequency spectrum to 20,000 Hz at the high end.

There are several methods for characterizing sound. The most common is the A-weighted sound level or dBA (A Weighted Noise Level). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. The A-weighted level is closely correlated with annoyance caused by noise sources such as traffic and construction activity. Table 3.6-2 shows typical A-weighted noise levels that occur in various indoor and outdoor environments.

3.6.3 Noise Descriptors

Because sound levels can vary over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations is utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called the equivalent noise level (L_{eq}). The hourly L_{eq} used for this report is denoted as dBA $L_{eq[h]}$.

3.6.4 Human Response to Noise

It is widely accepted that sound pressure level changes of 3 dBA are considered just

Table 3.6-1. Definitions of Acoustical Terms

Term	Definition
Decibel (dB)	A dB is a unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for sound in air is 20 micro Pascals.
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sounds are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level (dBA)	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level (L_{eq})	The average A-weighted noise level during the measurement period. The hourly L_{eq} used for this report is denoted as dBA $L_{eq[h]}$.
Ambient Noise Level	The ambient noise level is the composite of noise from all sources near and far, and represents the normal or existing level of environmental noise at a given location.

Table 3.6-2. Typical Noise Levels in the Environment

Common Outdoor Noise Source	Noise Level (dBA)	Common Indoor Noise Source
Jet fly-over at 1,000 ft	120	
	110	Rock concert
Pile driver at 100 ft	100	
Large truck passby at 50 ft	90	Night club with live music
Gas lawn mower at 50 ft	80	Noisy restaurant
	70	Vacuum cleaner at 10 ft
Commercial/Urban area daytime		Normal speech at 3 ft
Suburban daytime	60	Active office environment
Urban area nighttime	50	Quiet office environment
Suburban nighttime	40	
Quiet rural areas		
	30	Library
		Quiet bedroom at night
Wilderness area	20	
	10	Quiet recording studio
Threshold of human hearing	0	Threshold of human hearing

Source: Adapted from Caltrans 2008 in Noise Study Report Format Guidance Document.

noticeable to most people. A change of 5 dBA is readily perceptible. An increase in sound pressure level of 10 dBA is perceived as being twice as loud, while a decrease of 10 dBA is perceived as being half as loud.

3.6.5 Existing Noise Sources

Noise in the vicinity of Vandenberg AFB results from vehicular transportation, industrial facility operations, construction activities, and railroad operations (e.g., Union Pacific and AMTRAK). In addition, periodic mission support activities (e.g., rocket launches and aircraft operations) create sporadic noise as dictated by the activity. In general, ambient L_{eq1H} measurements on Vandenberg AFB range from around 35 to 60 dB (Thorson et al. 2001).

The project site and nearby vicinity are primarily exposed to noise generated by traffic from the surrounding roadways, with intermittent noise exposure from SLC operations and associated mission support activities. In addition, periodic railroad activities on the Union Pacific tracks located along the coastline between the north and south launch facilities and the Pacific Ocean are sources of noise in the project vicinity.

3.7 Public Health and Safety

A hazardous material or waste is a substance that due to its quantity, concentration, or chemical/physical characteristics, may present substantial risk to public health and

welfare, workers, or the environment.

Hazardous materials and wastes are those substances defined as hazardous by the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act (42 USC 9601-9675), Toxic Substances Control Act (15 USC 2601-2671), the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (42 USC 6901-6992), and as defined in state laws and regulations.

Federal and state OSHA regulations govern protection of personnel in the workplace. All construction activities, facility operation, and maintenance on Vandenberg AFB are subject to federal OSHA regulations. In addition, California OSHA has jurisdiction over non-federal operations south of Honda Ridge Road on South Vandenberg AFB.

Vandenberg AFB is a secure, federal military installation. Access to Vandenberg AFB, including the project site, is controlled by the Air Force and restricted to military personnel and authorized contractors and visitors.

3.7.1 Hazardous Materials Management

Approximately 5,000 hazardous materials are used at Vandenberg AFB to support mission activities. To ensure compliance with applicable regulations for the transport, handling, storage, use, and disposal of hazardous materials, all Air Force personnel

and contractors that handle hazardous materials are required to comply with California Business Plan requirements. In addition, management of hazardous materials used on Vandenberg AFB follows procedures stipulated in the 30th Space Wing Plan (SWP) 32-7086, Hazardous Materials Management Plan. The Base HazMart maintains inventories of hazardous materials purchased by the Air Force and its contractors. Before releasing hazardous materials to the user, HazMart staff ensures a copy of the Material Safety Data Sheet is available and verifies that the material is suitable for use on Vandenberg AFB. By providing handling and use information, Vandenberg AFB controls the potential misuse of hazardous materials, maintains an accounting of the types of hazardous materials used on the Base, and prepares usage and emissions reports as required by federal, state, and local regulations. In addition to Air Force requirements, Vandenberg AFB is subject to all federal, state, and local hazardous materials regulations, including inspection by federal, state, and local regulatory agencies.

No hazardous materials may be brought on Vandenberg AFB without prior coordination, approval, and a tracking barcode issued by HazMart. All contractors must apply for a HazMart shop code and enroll in the Enterprise Environmental, Safety, and Occupational Health Information Management System hazardous materials authorization and tracking system.

Additionally, Vandenberg AFB has established health and safety requirements, including industrial hygiene and ground safety, to minimize potential risk to the general public and personnel. Industrial hygiene is the joint responsibility of the 30th Space Wing Safety Office (30 SW/SE) and the 30th Medical Operations Squadron, Bioenvironmental Engineering Element. Responsibilities include monitoring of exposure to workplace chemicals and physical hazards, hearing and respiratory protection, medical monitoring of workers subject to chemical exposures, and oversight

of all hazardous or potentially hazardous operations. Ground safety is the responsibility of the 30 SW/SE and includes protection from hazardous situations, including physical hazards (i.e., holes and ditches, uneven terrain, sharp or protruding objects, unstable ground) and biological hazards (e.g., vegetation [poison oak and stinging nettle], animals [insects, spiders, and snakes], and disease vectors [ticks and rodents]).

Hazardous materials potentially used during construction and annual maintenance activities include petroleum, oil, and lubricants (POLs) in equipment and vehicles.

3.7.2 Hazardous Waste Management

Hazardous waste management at Vandenberg AFB complies with the Resource Conservation and Recovery Act Subtitle C (40 CFR Part 240-299) and with California Hazardous Waste Control Laws as administered by CalEPA, Department of Toxic Substances Control, under Title 22, and Division 4.5 of the California Code of Regulations (CCR). These regulations require that hazardous wastes be handled, stored, transported, disposed of, or recycled according to defined procedures. The Vandenberg AFB *Hazardous Waste Management Plan* (30 SWP 32-7043A) outlines hazardous waste management procedures.

An Air Force Generator Identification Number is used to account for hazardous wastes generated on Vandenberg AFB. Because of the amount of hazardous waste generated per month, Vandenberg AFB is classified as a large quantity, fully regulated generator, and is required to comply with all federal, state, and local laws regulating the generation, storage, transportation, and disposal of hazardous waste. Vandenberg AFB uses a “cradle to grave” waste management approach. Generally, hazardous waste follows the 90-day accumulation rules as permitted by regulation, or is stored up to 270 days at authorized satellite accumulation

points (SAPs). SAPs are located at the point of generation, and wastes may be stored until 55 gallons of hazardous waste or 1 quart of extremely or acutely hazardous waste is accumulated. When the SAP limit is reached, the waste is transferred in a properly labeled Department of Transportation approved container from its point of origin to the Consolidated CAP at Building 3300. All CAP and SAP managers require training prior to commencement of work. All hazardous waste is removed from Vandenberg AFB under a hazardous waste manifest, and shipped off-site for final disposal.

3.7.3 Installation Restoration Program

The federal Installation Restoration Program (IRP) was implemented at DoD facilities to identify, characterize, and restore hazardous substance release sites. There are currently 136 IRP sites throughout Vandenberg AFB grouped into six Operable Units based on similarity of their characteristics.

IRP sites are remediated through the Federal Facilities Site Remediation Agreement, a working agreement between the USAF, the

Central Coast Regional Water Quality Control Board (RWQCB), and the Department of Toxic Substances Control. In addition to IRP sites, there are identified Areas of Concern (AOCs), where potential hazardous material releases are suspected; and Areas of Interest (AOIs), defined as areas with the potential for use and/or presence of a hazardous substance. Various contaminants could be present at these sites including trichloroethylene, PCBs, VOCs, total petroleum hydrocarbons, asbestos, and other hazardous contaminants. There are 24 open hazardous release sites, including two IRP sites, 11 AOCs, and 11 AOIs, located within the project area (Table 3.7-1).

One open IRP site is located at the South General Services Administration Service Station located at the intersection of Mesa Road and Monroe Street. This area is identified as an IRP site due to the presence of POLs. An IRP site that requires action is located at the National Aeronautics and Space Administration Building 836 Ditch located at the intersection of Clark Street and Lompoc Street. This area is identified as an

Table 3.7-1. AOCs and AOIs in the Project Area

Site ID	Description
AOC-157	Sludge piles at the sewage treatment and retention pond near Building 893.
AOC-159	Wash rack and hazardous waste storage at Building 886.
AOC-59	Auto service pad wash rack located in Buildings 839 and 837.
AOC-194	Associated with Building 810. Information on the specific contaminants was not available.
AOC-221	Specific information was not available for this site.
AOC-61	Associated with an abandoned underground storage tank in Building 861, the Missile Space, Research, and Engineering Building.
AOC-155	Stained soil and transformers associated with Building 850, an electrical substation.
AOC-214	Located in Buildings 870 and 871. Information on the specific contaminants was not available.
AOC-199	Located in Building 866. Information on the specific contaminants was not available.
AOC-13	Underground storage tank located in Building 879. Information on the specific contaminants was not available.
AOC-197	Located in Building 510. Information on the specific contaminants was not available.
AOC-20-	Former diesel tanks, oil/water separator, and transformer located in Building 676. Information on specific contaminants was not available.
AOI-490	No information was available for this site.
AOI-480	No information was available for this site.
AOI-138	No information was available for this site.
AOI174	No information was available for this site.
AOI-424	No information was available for this site.
AOI-149	No information was available for this site.
AOI-423	No information was available for this site.
AOI-425	No information was available for this site.
AOI-426	No information was available for this site.
AOI-151	No information was available for this site.
AOI-225	No information was available for this site.

IRP site due to the presence of waste oil and solvents. Information on the location and contaminants associated with the AOCs and AOl is provided in Table 3.7-1.

3.7.4 Unexploded Ordnance

Several areas on Vandenberg AFB were used as training ranges and have the potential to contain UXO. Certain portions of the project site are located within areas known to contain UXO.

3.8 Transportation

The circulation system adjacent to the project site consists of regional highways and arterial streets (i.e., major road used for through traffic). Regional access to Vandenberg AFB is provided by a network of freeways, including Highway 101, Highway 1, SR 135, and SR 246. Primary access to Vandenberg AFB is through three gates: the Santa Maria Gate (the main gate), Solvang Gate, and South Gate. The Santa Maria Gate provides access to the northern side of the cantonment area. The Solvang Gate provides access to North Vandenberg AFB and the South Base Gate provides access to South Vandenberg AFB.

Highway 101 is a four lane, north-south freeway and is the principal route between northern and southern California. Access between Vandenberg AFB and Highway 101 is provided via the Highway 1, SR 135, and SR 246 interchanges. Highway 1 is a north-south highway that provides direct access to Vandenberg AFB at the Santa Maria Gate. SR 135 is a two lane, east-west rural state highway that extends westward from Highway 101 and intersects with Highway 1 near Vandenberg AFB. SR 246 (West Ocean Avenue) is primarily a two lane, east-west rural highway that provides direct access to North Vandenberg AFB via the Solvang Gate and South Vandenberg AFB via the South Base Gate.

Roadways in the project vicinity are within Vandenberg AFB's jurisdiction. These roadways include Bear Creek Road, Dile Road, Micro Road, Arguello Road, Honda

Ridge Road, CDT Access Road, Road N, Coat Road, Ordnance Road, Spin Road, West Ocean Road, Ocean Park Road, Monroe Street, Clark Street, Lompoc Street, Mesa Road, Santa Ynez Ridge Road, VHF Road, and unnamed access roads. The project site is accessible from South Base Gate via West Ocean Avenue and Coast Road.

3.8.1 Roadway Operations

Exiting roadway conditions are evaluated based on roadway capacity and traffic volume. The capacity, which reflects the ability of the network to serve the traffic demand of a roadway, depends on the roadway width, number of lanes, intersection control, and other physical factors.

Level of Service (LOS) is used to characterize the overall traffic operations along a roadway. LOS A through F are used to rate roadway operations, with each level defined by a range of traffic volume to roadway capacity. LOS A, B, and C are considered good operating conditions with minor to tolerable delays experienced by motorists. LOS D represents below-average conditions. LOS E reflects a roadway at maximum capacity, and LOS F represents traffic congestion. Most roads on Vandenberg AFB operate at or better than the acceptable standard of LOS C (Vandenberg AFB 2009).

3.9 Water Resources

The federal CWA provides for the restoration and maintenance of the physical, chemical, and biological integrity of the nation's waters. The CWA and implementing USEPA regulations provide the authority and framework for state regulations. The California Porter-Cologne Water Quality Act provides a framework for establishing beneficial uses of water resources and the development of local water quality objectives to protect these beneficial uses. The Central Coast Water Quality Control Plan (Basin Plan) assigns beneficial uses to water bodies and

provides local water quality objectives to protect these beneficial uses.

Section 303(d) of the federal CWA requires states to identify surface water bodies that are polluted (water quality limited segments). These surface water bodies do not meet water quality standards even after discharges of wastes from point sources have been treated by the minimum required levels of pollution control technology. There are no water bodies in the project area that are included on the CWA Section 303(d) List of Water Quality.

The CWA mandates the NPDES Program, which requires a permit for the discharge of any pollutant to Waters of the U.S. from point and non-point sources. Non-point sources include stormwater runoff from industrial, municipal, and construction sites.

EO 11988, *Floodplain Management*, requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities" for federal actions.

EO 11990, *Protection of Wetlands*, requires federal agencies to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. Federal agencies must avoid undertaking or providing assistance for new construction located in wetlands unless there is no practicable alternative to such construction and the proposed action includes all feasible measures to minimize harm to wetlands that may result from such use.

In California, the State Water Resources Control Board (SWRCB) and the RWQCB administer the NPDES Program for municipalities and construction activities through General Permits. The Central Coast RWQCB is the state agency responsible for the Vandenberg AFB area.

The NPDES Municipal General Permit prohibits discharges of material other than stormwater to Waters of the U.S. and requires implementation of BMPs to reduce pollutants in stormwater to the maximum extent practicable.

The NPDES Construction General Permit regulates construction sites of 1 or more acre and the discharge of pollutants in stormwater to Waters of the U.S.

On Vandenberg AFB, the 30 CES/CEA Environmental Quality, Water Resources Department reviews all requests for discharges of wastewater to grade (Discharge to Grade Program) to protect groundwater quality and comply with state water quality regulations. Wastewater that contains contaminants above certain levels may not be discharged to grade.

3.9.1 Surface Water

The major freshwater resources of the Vandenberg AFB region include six streams, comprising two major and four minor drainages. The major drainages are San Antonio Creek and the Santa Ynez River. The minor drainages include Shuman Creek, Bear Creek, Cañada Honda Creek, and Jalama Creek (Vandenberg AFB 2010).

Monthly stream flow on Vandenberg AFB generally corresponds to trends in precipitation, although minor increases in precipitation are not always reflected in the flows. Generally, peak rainfall occurs between November and April. Average annual precipitation is approximately 14 inches per year (National Oceanic and Atmospheric Administration 2011).

Cañada Honda Creek and the Santa Ynez River are the main tributaries in the project area that flow directly to the ocean. Lompoc Canyon (tributary to Santa Ynez River) and Red Roof Canyon (tributary to Cañada Honda Creek) are small drainages that traverse the project site. Seven unnamed, small drainages that are tributary to Cañada Honda Creek also traverse the project site. No project-specific surveys were conducted for the Proposed Action. However, it is likely the drainage features that traverse the project site could be considered jurisdictional (i.e., under the authority of USACE per the Clean Water Act) by USACE as Waters of the U.S. Floodplain

A portion of the Feeder Line K7 is located within the 100-year floodplain defined by the FEMA for the Santa Ynez River (Figure 3.9-1).

3.9.2 Groundwater

All of the Feeder Line K7 and the northern portion of the Feeder Line K1 overlie the Santa Ynez River Valley Aquifer. Groundwater is present in unconsolidated alluvial and terrace deposits, including the Orcutt Sand, which underlies much of the project area. The Santa Ynez River fault, which traverses the project area, does not directly affect the flow of groundwater entering the basin from the Santa Ynez Mountains. Water quality in this (western) portion of the Santa Ynez River Valley Aquifer is generally poor, with total dissolved solids concentrations up to 2,000 to 8,000 milligrams per liter (California Department of Water Resources 2003). The southern portion of the Feeder Line K1 is underlain by volcanic rocks, shale, and sandstone units that are generally non-water-bearing.

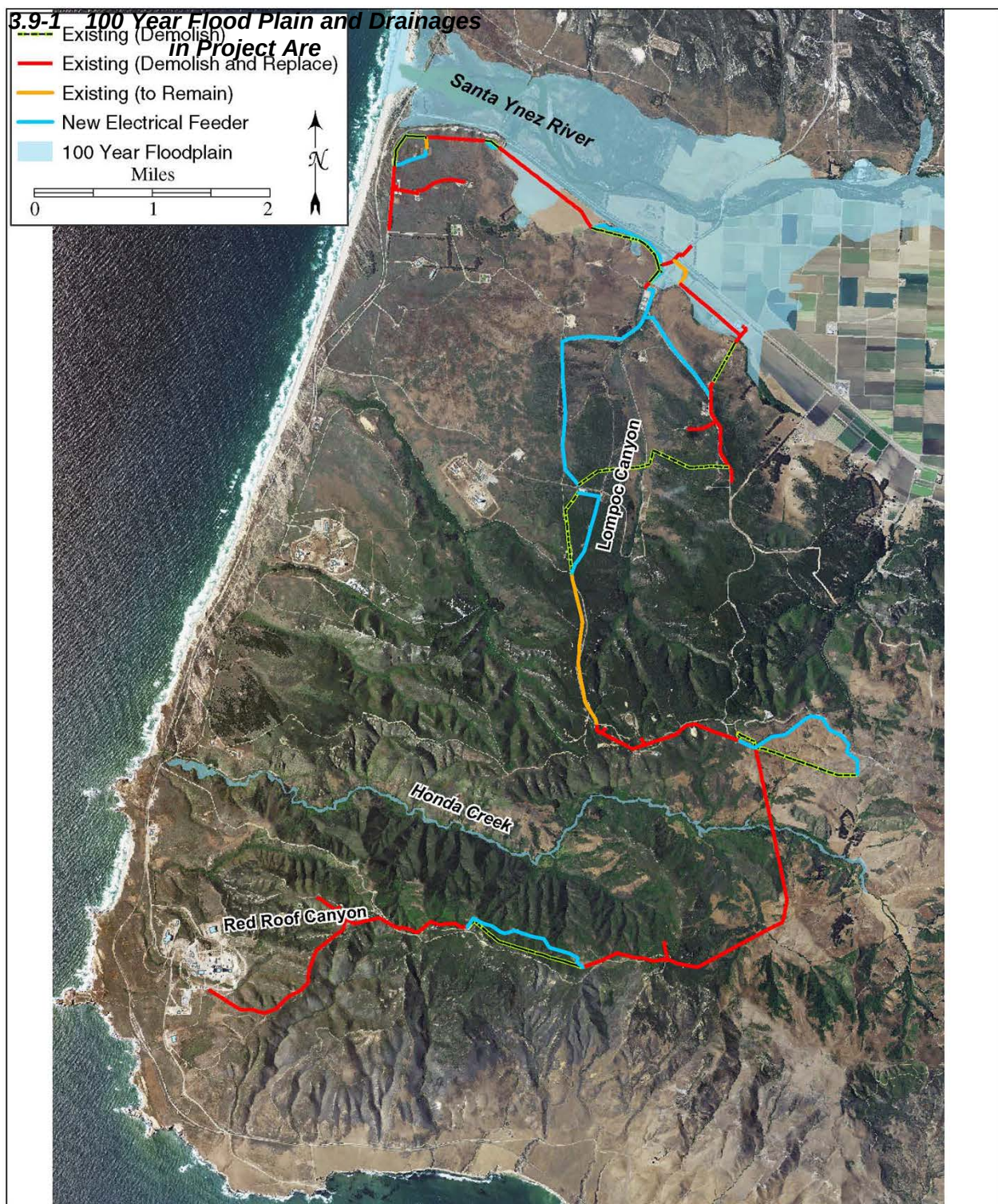


Figure 3.9-1. 100 Year Flood Plain and Drainages in Project Area

Chapter 4. Environmental Consequences

4.1 Air Quality

Potential air quality impacts due to the proposed alternatives were evaluated on the basis of their direct and indirect emissions. Adverse air quality impacts would occur if implementation of an alternative would directly or indirectly:

- Expose people to localized (as opposed to regional) air pollutant concentrations that violate federal or state ambient air quality standards;
- Cause a net increase in a pollutant or pollutant precursor emission that exceeds relevant emission significance thresholds (such as the numerical values of major source thresholds for nonattainment pollutants);
- Conflict with adopted air quality management plan policies or programs; or
- Exceed caps (limits) as imposed by federal and state GHG regulations. These regulations are in the draft stage, but would likely be in place during project execution.

Criteria to determine the significance of air quality impacts are based on federal, state, and local air pollution standards and regulations. The SBCAPCD has not established criteria for assessing the significance of air quality impacts for NEPA purposes. However, since Santa Barbara County violates the state standard for PM₁₀, dust mitigation measures are required for all discretionary construction activities regardless of the significance of the fugitive dust impacts based on the policies in the 1979 Air Quality Attainment Plan. Construction activities also must comply with the requirements of SBCAPCD Rule 345, Control of Fugitive Dust from Construction and Demolition Activities. Under Rule 345, construction, demolition, and/or earthmoving activities are prohibited

from causing discharge of visible dust outside the property line, and must utilize standard BMPs to minimize dust from truck hauling, track-out/carry-out from active construction sites, and demolition activities. These requirements are identified as project environmental protection measures in Section 2.5. If emissions exceed a significance threshold described above, further analysis of the emissions and their consequences would be performed to assess whether there was likelihood of an adverse impact to air quality. The nature and extent of such analysis would depend on the specific circumstances. The analysis could range from simply a more detailed and precise examination of the likely emitting activities and equipment, to air dispersion modeling analyses. If Proposed Action emissions were determined to increase ambient pollutant levels from below to above a federal or state ambient air quality standard, these emissions would be adverse.

4.1.1 Alternative A: Proposed Action

Air quality impacts from activities due to the proposed replacement of the Feeder Line K1 and K7 overhead electrical lines would occur from (1) combustive emissions due to the use of fossil fuel-powered equipment and (2) fugitive dust emissions (PM₁₀/ PM_{2.5}) due to the operation of equipment on exposed soil. Construction activity data associated with each project alternative were used to estimate proposed combustive and fugitive dust emissions.

Factors needed to derive construction source emission rates were obtained from *Compilation of Air Pollution Emission Factors, AP-42, Volume I* (USEPA 1995), the *OFFROAD2007 Model* for off-road construction equipment (CARB 2006a), and the *EMFAC2007 Model* for on-road vehicles (CARB 2006b). Appendix A includes data and assumptions used to calculate proposed construction emissions.

Table 4.1-1 summarizes the emissions estimated for replacement of the overhead electrical lines under Alternative A. These data show that proposed emissions would not exceed the significance threshold for any criteria pollutant. As a result, proposed activities from Alternative A would not produce adverse air quality impacts.

Greenhouse Gases and Global Climate Change

Emissions of GHGs are considered to have a potential cumulative impact on global climate. As shown in Table 4.1-1, Alternative A would incrementally increase emissions of CO₂ and other GHGs. Scientists are in general agreement that the Earth's climate is gradually changing and this change is due in part to emissions of CO₂ and other GHGs from manmade sources. The anticipated magnitude of global climate change is such that an adverse cumulative impact on global climate exists.

On the issue of global climate change, however, there are no adopted federal plans, policies, regulations, or laws mandating reductions in the GHG emissions that cause global climate change. The climate change research community has not yet developed tools specifically intended to evaluate or quantify end-point impacts attributable to the emissions of GHGs from a single source. In particular, the impacts to climate change from the very minor incremental increase in GHGs from Alternative A cannot be determined given the current state of the science and assessment methodology.

To calculate emissions associated with the Proposed Action, emissions attributable to Scopes 1, 2, and 3 as defined in EO 13514 have been estimated. Scope 1 emissions

include those emissions attributable to sources that are owned and operated by the federal government. These emissions would include emissions from stationary sources at the project site.

Scope 2 emissions include those emissions that are direct GHG emissions resulting from the generation of electricity, heat, or steam purchased by a federal agency. Scope 3 emissions include GHG emissions from sources not owned or directly controlled by a federal agency, but related to agency activities such as the construction activities proposed under Alternative A.

Currently, there are no formally adopted or published NEPA thresholds for GHG emissions. On 18 February 2010, the CEQ released draft guidance on addressing climate change in NEPA documents. The draft guidance, which has been issued for public review and comment, recommends quantification of GHG emissions, and proposes a threshold of 25,000 metric tons of CO₂e emissions. The CEQ indicates that use of 25,000 metric tons of CO₂e emissions as a reference point would provide federal agencies with a useful indicator, rather than an absolute standard of significance, to provide action-specific evaluation of GHG emissions and disclosure of potential impacts. In the absence of formally-adopted thresholds of significance, this EA compares GHG emissions that would occur from Alternative A with this 25,000 metric ton level.

Table 4.1-1 shows that the annual CO₂e emissions estimated for the Proposed Action would be less than the significance threshold of 25,000 metric tons of CO₂e. Therefore, Alternative A would not produce adverse cumulative impacts to global climate change.

Table 4.1-1. Proposed Emissions under Alternative A (Proposed Action) (Tons/Year)

	VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	CO ₂ e
Construction Equipment	0.19	0.68	1.75	0.00	0.08	0.08	347.01
Fugitive Dust	-	-	-	-	0.24	0.02	-
Total	0.19	0.68	1.75	0.00	0.32	0.10	347.07
Significance threshold	25	25	25	25	25	25	25,000
Exceeds threshold?	No	No	No	No	No	No	No

4.1.2 Alternative B: Realigned Alternative

Under Alternative B, site development would be similar to Alternative A, but with a slightly different alignment. Therefore, impacts to air quality and global climate change would be the same as described for Alternative A.

4.1.3 Alternative C: No-Action Alternative

Under the No-Action Alternative, replacing the overhead electrical lines on South Vandenberg AFB would not occur. Therefore, no impacts to air quality would occur as a result of emissions associated with project activities.

4.2 Biological Resources

Impacts to biological resources would occur if special status species (i.e., endangered, threatened, rare, or candidate) or their habitats, as designated by federal and state agencies, would be directly or indirectly affected by project-related activities. In addition, impacts to biological resources are considered adverse if substantial loss, reduction, degradation, disturbance, or fragmentation would occur to native species or their habitats. Potential effects can be short-term (e.g., noise and dust during construction) or long-term impacts, including the permanent loss of vegetation and, consequently, loss of the capacity of habitats to support wildlife populations.

4.2.1 Alternative A: Proposed Action

All of the plant communities affected by construction under the Proposed Action are mixed non-native and native habitats that are well represented in the region. No project related construction or activities would occur in riparian areas, and therefore no direct impacts to riparian plant communities or habitats are expected. As described below, plant communities potentially affected by construction of Feeder Lines K1 and K7 have the potential to support host species, such as

seacliff buckwheat, and habitat for listed plant and wildlife species. Although natural vegetation communities occurring in the project area would be permanently removed, the small amount of loss of these vegetation types associated with access and removal of poles would not be considered adverse due to the small amount removed and the abundance of these communities in the project vicinity.

Wildlife Species

As described above, implementation of the Proposed Action would result in the permanent loss of plant communities that provide habitat for common wildlife species. However, the small amounts that would be permanently lost would not measurably reduce regional populations of common wildlife species. No natural riparian or wetland habitat would be lost. Consequently, no direct adverse impacts to common terrestrial wildlife would occur.

Temporary, indirect impacts to wildlife species may occur within adjacent wildlife habitat due to an increase in dust, noise, and other construction related disturbances. Temporary disturbances due to noise and human presence could disrupt foraging and roosting activities, or cause common bird and wildlife species to avoid the work area during construction periods. However, common wildlife species in the project area have adapted to some level of ongoing human activity and would continue to use the adjacent areas in the intervals between disturbances. Therefore, temporary, incidental disturbances during construction would not result in adverse indirect impacts to wildlife species.

Special Status Species

The USFWS issued a Biological Opinion for the Proposed Action on May 9, 2012 (refer to Appendix B-1). Vandenberg AFB will comply with all terms and conditions and reporting requirements for implementation of the reasonable and prudent measures stipulated in the Biological Opinion. Potential effects of

the Proposed Action on federally and state listed species are discussed below. Implementation of the environmental protection measures described in Section 2.5, Environmental Protection Measures, and complying with all the terms and conditions and reporting requirements in the Biological Opinion would ensure that impacts on special status species would be minimized.

California red-legged frog

California red-legged frogs have the potential to be present in any permanent water bodies on Vandenberg AFB. However, proposed demolition and construction activities would not occur in any water bodies that could provide habitat for this species. Additionally, Feeder Lines K1 and K7 would not cross any permanent water bodies, although several dry or seasonally dry tributaries to Cañada Honda Creek and Bear Creek would be traversed. Nonetheless, the California red-legged frog has been found up to 400 feet from water in riparian vegetation, and may disperse through upland areas. Therefore, proposed activities that occur outside riparian corridors have the potential to encounter and adversely affect California red-legged frogs. The closest proposed construction activity to a mapped permanent water body is approximately 0.25 mile east of Bear Creek (Feeder Line K1).

Proposed activities would not occur in standing or flowing water that would provide habitat for eggs or juveniles. All overhead electrical lines would span riparian corridors and no access road would be constructed within riparian areas. Potential impacts would be limited to construction personnel and equipment transiting through project areas. All personnel would be required to attend a mandatory education program about all listed species in the project area and their habitats. Furthermore, a qualified biologist familiar with California red-legged frogs would monitor activities within areas determined sensitive for this species. Implementation of the environmental protection measures described in Section 2.5, Environmental Protection Measures, and complying with all the terms and conditions and reporting requirements

included in the Biological Opinion would ensure no adverse impacts to California red-legged frogs would occur.

El Segundo blue butterfly

Proposed activities could occur during the flight season of the El Segundo blue butterfly; however, activities within the currently known to be occupied area near Honda Ridge Road would not occur between June 15 and August 15. Proposed activities that would have direct effects on El Segundo blue butterflies include removal and disturbance of seaciff buckwheat (the host plant for El Segundo blue butterfly) and vehicle traffic in proximity to seaciff buckwheat. Removal of mature seaciff buckwheat plants would eliminate potential habitat for El Segundo blue butterfly within the project area. Soil compaction activities, including vehicular traffic, have the potential to crush diapausing pupae (nonfeeding stage between the larva and adult), resulting in the mortality of individuals. Temporary disturbances could also promote growth of non-native plant species as native vegetation is removed.

Implementation of the environmental protection measures described in Section 2.5, Environmental Protection Measures, including enhancing suitable habitat for El Segundo blue butterfly at a 2:1 ratio in nearby areas when avoidance is not feasible, and complying with all the terms and conditions and reporting requirements included in the Biological Opinion would ensure no adverse impacts to this species would occur.

Vernal pool fairy shrimp

Proposed activities could affect vernal pool fairy shrimp and their habitat in the project area. If construction workers or vehicular traffic disturb vernal pool fairy shrimp habitat in the project area, cysts could be crushed or buried to a depth that would prevent completion of the life cycle. In addition, if proposed activities altered the hydrology of the project area, areas known to support vernal pool fairy shrimp may no longer

sufficiently inundate to support the complete life cycle of the species.

Potential and vernal pool fairy shrimp habitat known to be occupied would be protected from disturbance during proposed activities. The majority of new powerlines would be installed adjacent to existing road shoulders, which are routinely subject to disturbances associated with road and existing utilities maintenance. However, these disturbances have occurred on a continuous basis in the past, and vernal pool fairy shrimp has continued to exist adjacent to these areas.

Implementation of the environmental protection measures described in Section 2.5, Environmental Protection Measures, including flagging and placing construction fencing around vernal pool fairy shrimp habitat, reseeding areas where native vegetation is removed from designated vernal pool fairy shrimp buffer zones, removing invasive species from a nearby buffer area at a 1:1 ratio for temporary and 5:1 ratio for the permanent disturbances, avoiding fill material in vernal pool fairy shrimp buffer zones, placing appropriate sedimentation barriers down-slope from the project site, and restoring the topography of vernal pool fairy shrimp buffer zones if disturbed to allow the lateral movement of water to occupied habitats, and complying with all the terms and conditions and reporting requirements included in the Biological Opinion would ensure no adverse impacts to this species would occur.

Waters of the U.S. and Wetlands

Impacts to jurisdictional Waters of the U.S. and wetlands are considered adverse if the Proposed Action results in a net loss of wetland area or habitat value, either through direct or indirect impacts to wetland vegetation, loss of habitat for wildlife, degradation of water quality, or alternations in hydrological function.

Implementation of environmental protection measures described in Section 2.5, Environmental Protection Measures, would include avoiding construction and vegetation

removal within Waters of the U.S. and wetland areas and monitoring of these areas by a qualified biologist during construction. This avoidance approach would ensure that construction of the Proposed Action would not place dredge or fill material in Waters of the U.S. Therefore, impacts would not be adverse.

4.2.2 Alternative B: Realigned Alternative

Impacts on biological resources would be the same as described for Alternative A because the alignment route for Alternative B would not affect wildlife species, special status species or their habitats.

4.2.3 Alternative C: No-Action Alternative

Under the No-Action Alternative, replacing the overhead electrical lines on South Vandenberg AFB would not occur; therefore, no impacts to biological resources would occur.

4.3 Cultural Resources

The Proposed Action is subject to compliance with all relevant authorities governing cultural resources, including Section 106 of the NHPA and Air Force Instruction 32-7065.

Compliance with Section 106 of the NHPA also satisfies federal agencies responsibilities for considering potential project related effects to cultural resources under NEPA. Section 106 of the NHPA requires federal agencies to consider the effects of proposed federal undertakings on cultural resources that are listed in or eligible for listing in the NRHP (i.e., historic properties). Part of Section 106 compliance requires the federal agency to determine whether the undertaking would have no effect to historic properties, no adverse effect to historic properties, or an adverse effect to historic properties. The Section 106 implementing regulations (36 CFR Part 800) prescribe the process for making these determinations.

4.3.1 Alternative A: Proposed Action

Sixteen archaeological sites are identified within or immediately adjacent to the Proposed Action. A detailed analysis of the environmental consequences at each archaeological site was prepared for compliance with Section 106 of the NHPA (Brasket 2011; Enright et al. 2011). Table 4.3-1 summarizes the environmental consequences associated with the Proposed Action.

One site had previously been determined ineligible for the NRHP, and for the Proposed Action another five sites were determined ineligible. Thus, six sites do not have the significant characteristics that qualify them as “historic properties” that are eligible for listing

in the NRHP. Therefore, the Proposed Action would not have significant consequences to them. Of the remaining 10 sites, three have been determined eligible for listing in the NRHP and seven are unevaluated (i.e., assumed eligible for the purposes of the Proposed Action). For purposes of the Proposed Action, all seven unevaluated sites are assumed to be eligible for the NRHP. The Proposed Action has the potential to adversely affect four of these eligible sites. The Proposed Action would have no adverse effect to the other six historic properties within the APE.

The Proposed Action includes implementation of environmental protection measures described in Section 2.5, Environmental

Table 4.3-1. Environmental Consequences to Cultural Resources from the Proposed Action

Site CA-SBA-	NRHP Eligibility	Feeder Line	Environmental Consequences
550	Eligible	K1	The single existing pole will be replaced. The current pole impacts the viewshed from the site. Replacing the pole will continue that environmental consequence.
923	Unevaluated, assumed eligible	K7	Excavations revealed a substantial archaeological deposit within the area of direct impact (Enright et al. 2012). Replacing the seven existing poles within the site will disturb the archaeological deposit and thus will be an environmental consequence.
927H	Unevaluated	K7	The Proposed Action passes through the site but no archaeological materials or historical features were found within the area of direct impact (Enright et al. 2012). Consequently, the Proposed Action will have no environmental consequence.
931	Eligible	K7	Excavations revealed a substantial archaeological deposit within the area of direct impact (Enright et al. 2012). Replacing the seven existing poles within the site will disturb the archaeological deposit and thus will be an environmental consequence.
932	Ineligible	K7	Because the site is not eligible for the NRHP, the Proposed Action will have no environmental consequence.
1130	Unevaluated	K7	Testing within the existing power line corridor found no evidence of the archaeological site (Enright et al. 2012). Consequently, replacing the three existing poles within the site would have no environmental consequence.
2412/2941	Eligible	K7	Excavations revealed that the proposed route passes through a portion of the site that lacks integrity and lacks the site's significant qualities (Enright et al. 2012; Lebow et al. 2003). Consequently, the Proposed Action will have no environmental consequence.
2446	Ineligible	K7	No environmental consequences to CA-SBA-2446 because it is not eligible for the NRHP.
2829	Ineligible	K1	Because the site is not eligible for the NRHP, the Proposed Action will have no environmental consequence.
2831	Unevaluated	K1	Archaeological testing found that the site does not extend to the power line. Consequently, there would be no environmental consequence from the Proposed Action.
2834	Ineligible	K7	No environmental consequences to CA-SBA-2834 because it is not eligible for the NRHP.
2836	Ineligible	K7	No environmental consequences to CA-SBA-2836 because it is not eligible for the NRHP.
2946H	Unevaluated	K7	Only limited archaeological materials and no historical features were found within the proposed route (Enright et al. 2012). Consequently, the Proposed Action will have no environmental consequences.
2952	Unevaluated	K7	Excavations revealed a substantial archaeological deposit within the area of direct impact (Enright et al. 2012). Replacing the single pole within the site will disturb the archaeological deposit and thus will be an environmental consequence.
3107H	Unevaluated	K7	The existing line is outside the site. The proposed route to be placed in the shoulder of an existing road, outside the site boundary, to avoid any environmental consequences.
4009H	Ineligible	K7	No environmental consequences to CA-SBA-4009 because it is not eligible for the NRHP.

Protection Measures, including installation of temporary exclusionary fencing, prohibiting vehicular access within NRHP-eligible sites, and adherence to 36 CFR 800.13 (Post review discoveries) and Vandenberg AFB Integrated Cultural Resources Management Plan procedures in the event previously undocumented cultural resources are discovered during construction activities. Vandenberg AFB will also comply with all conditions stipulated in SHPO's concurrence letter dated April 23, 2012 (refer to Appendix B-2 for details). Adherence to these measures would minimize impacts on most of the NRHP-eligible sites within the project area. However, proposed activities would adversely affect four NRHP-eligible sites.

4.3.2 Alternative B: Realigned Alternative

This alternative is the same as Alternative A except that the proposed Feeder Line K7 route would be relocated to avoid archaeological sites where significant deposits would be adversely affected under Alternative A. Table 4.3.2 summarizes the environmental consequences associated with Alternative B. Under this alternative, the new feeder line would be realigned as follows: 1) one existing pole would be relocated 150 feet away from the Honda Ridge Rock Art site; 2) the existing electrical line segment between Clark and Santa Ynez Roads would be abandoned in-place and operate as an emergency backup system; 3) the proposed route located approximately 4,200 feet east of Arguello Boulevard would be adjacent to an existing road north of the Alternative A route; and 4) the proposed route would be adjacent to Spin Road between Coast Road and the eastern end of Spin Road.

Vandenberg AFB would adopt a strategy of avoidance by imposing conditions upon the installation and removal of poles within NRHP-eligible site boundaries and by modifying the alignment of the new feeder lines. Realigning the new feeder line route would reduce impacts on cultural resources compared to Alternative A.

Alternative B includes implementation of environmental protection measures described in Section 2.5, Environmental Protection Measures, including installation of temporary exclusionary fencing, requiring archaeological monitoring, prohibiting vehicular access within NRHP-eligible sites where significant deposits would be impacted, modifying pole removal within NRHP-eligible sites where significant deposits would be impacted, and adhering to 36 CFR 800.13 (Post review discoveries) and Vandenberg AFB Integrated Cultural Resources Management Plan procedures in the event previously undocumented cultural resources are discovered during construction activities. Adherence to these measures should ensure none of the 10 sites eligible for, or assumed to be eligible for, listing in the NRHP would be adversely affected by Alternative B. Accordingly, Vandenberg AFB concluded that the Section 106 finding for Alternative B was no adverse effect to historic properties. The SHPO concurred with Vandenberg AFB's findings with conditions on April 23, 2012. Vandenberg AFB will comply with all conditions stipulated in SHPO's concurrence letter (refer to Appendix B-2 for details).

4.3.3 Alternative C: No-Action Alternative

Under the No-Action Alternative, replacing the overhead electrical lines on South Vandenberg AFB would not occur. Therefore, no impacts on cultural resources would occur.

4.4 Geology and Earth Resources

Factors considered in determining whether an alternative would have adverse impacts on geology and earth resources include the extent or degree to which implementation of an alternative would:

- Result in substantial soil erosion or the loss of topsoil; or
- Expose people or structures to potential substantial adverse effects, involving rupture of a known

Table 4.3-2. Environmental Consequences to Cultural Resources from Alternative B

Site CA-SBA-	NRHP Eligibility	Feeder Line	Environmental Consequences
550	Eligible	K1	The single existing pole will be removed and the replacement pole will be moved 150 feet to the east. Moving the pole will allow an unobstructed view from the site and thus will have no environmental consequence.
923	Unevaluated, assumed eligible	K7	The proposed route is outside the site boundary in a disturbed area adjacent to a road, on a different landform than the site. Existing poles in the site will be abandoned in place or will be cut off at the base and left on the ground. Removing the poles by helicopter, or by crane parked on the road, or by cutting them into pieces and manually transporting the segments would be allowed. Consequently, the proposed alignment would avoid environmental consequences.
927H	Unevaluated	K7	Existing poles within the site will be abandoned in place and will serve as an emergency backup system. The proposed alignment is far outside the site boundary. Consequently, Alternative B will have no environmental consequences.
931	Eligible	K7	The proposed route is well outside the site boundary. Existing poles within the site will be abandoned in place, or will be cut off at the base and left on the ground. Removing the poles by helicopter, by a crane parked on the road, or by cutting them into pieces and manually transporting the segments would be allowed. Consequently, environmental consequences would be avoided.
932	Ineligible	K7	Because the site is not eligible for the NRHP, the Proposed Action will have no environmental consequence.
1130	Unevaluated	K7	Testing within the existing power line corridor found no evidence of the archaeological site (Enright et al. 2012). Consequently, replacing the three existing poles within the site would have no environmental consequence.
2412/2941	Eligible	K7	Excavations revealed that the proposed route passes through a portion of the site that lacks integrity and lacks the site's significant qualities (Enright et al. 2012; Lebow et al. 2003). Consequently, the Proposed Action will have no environmental consequence.
2446	Ineligible	K7	No environmental consequences to CA-SBA-2446 because it is not eligible for the NRHP.
2829	Ineligible	K1	Because the site is not eligible for the NRHP, the Proposed Action will have no environmental consequence.
2831	Unevaluated	K1	Archaeological testing found that the site does not extend to the power line. Consequently, there would be no environmental consequence from the Proposed Action.
2834	Ineligible	K7	No environmental consequences to CA-SBA-2834 because it is not eligible for the NRHP.
2836	Ineligible	K7	No environmental consequences to CA-SBA-2836 because it is not eligible for the NRHP.
2946H	Unevaluated	K7	Little archaeological materials and no historical features were found within the proposed route (Enright et al. 2012). Consequently, the Proposed Action will have no environmental consequences.
2952	Unevaluated	K7	The proposed route is outside the site boundary in a disturbed area adjacent to a road, on a different landform than the site. The existing pole in the site will be abandoned in place or will be cut off at the base and left on the ground. Removing the pole by helicopter, or by crane parked on the road, or by cutting it into pieces and manually transporting the segments would be allowed. Consequently, the proposed Alternative B alignment would avoid environmental consequences.
3107H	Unevaluated	K7	The existing line is outside the site. The proposed route to be placed in the shoulder of an existing road, outside the site boundary, to avoid any environmental consequences..
4009	Ineligible	K7	No environmental consequences to CA-SBA-4009 because it is not eligible for the NRHP.

earthquake fault, strong seismic ground shaking, and/or liquefaction.

4.4.1 Alternative A: Proposed Action

Soils and Erosion

Site development would result in removal of vegetation and associated soil disturbance; thus, temporarily exacerbating the potential for erosion-induced sedimentation of Cañada Honda Creek, the Santa Ynez River, and

surface drainages (i.e., Lompoc Canyon, Red Roof Canyon, and seven unnamed drainages tributary to Cañada Honda Creek) that traverse the site.

The Proposed Action would be required to meet SWRCB requirements for a NPDES Construction General Permit. The construction contractor would prepare a SWPPP before project implementation, which would require implementation of standard erosion control

measures. Any exposed soil areas, including abandoned maintenance roads or temporary access roads, would be revegetated with a native seed mix and sufficient mulch to prevent erosion and meet the NPDES Construction General Permit 70 percent vegetation cover requirements. In addition, vegetation removal would be avoided in surface water drainages.

Due to implementation of a SWPPP and incorporation of BMPs into the project design, adverse impacts on geology and earth resources would not occur.

Seismicity

The project does not include development of any new structures beyond roads and new power poles. Although three potentially active faults within the project site and active faults located within the region could result in strong seismically induced ground shaking, the potential for surface fault rupture and liquefaction on Vandenberg AFB would be minimal. Therefore, adverse impacts associated with seismically induced ground shaking would not occur.

4.4.2 Alternative B: Realigned Alternative

Buildout of Alternative B would have a similar configuration (i.e., same amount of potential ground disturbance and impervious surfaces) as Alternative A. Therefore, impacts would be the same as those described for Alternative A.

4.4.3 Alternative C: No-Action Alternative

Under the No-Action Alternative, replacing the overhead electrical lines on South Vandenberg AFB would not occur; therefore, no impacts on geology and earth resources would occur.

4.5 Land Use and Coastal Zone Resources

Factors considered in determining whether an alternative would have adverse impacts on land use and coastal zone resources include the extent or degree to which implementation of an alternative would:

- Result in land uses on the project site that are incompatible with, or would have a substantial adverse impact on, the existing character of adjacent land uses; or
- Conflict with substantive requirements of land use plans or policies.

4.5.1 Alternative A: Proposed Action

Land Use

As stated in Section 3.5, Land Use, the project site is predominately undeveloped/open space and agriculture with the exception of launch operation support facilities associated with SLC-6, utility infrastructure, and miscellaneous mission support facilities. The Proposed Action would replace the overhead electrical line, Feeders K1 and K7 on South Vandenberg AFB. This alternative would be compatible with the existing facilities in the project area, and land use would be the same as existing uses onsite. Therefore, no adverse impacts on land use would occur.

Coastal Zone Management

The Proposed Action would be subject to a federal Coastal Zone Consistency Review for compliance with the CZMA. The Air Force has analyzed the effects of the Proposed Action by evaluating reasonable foreseeable direct and indirect effects on coastal uses and resources and has determined there would be no effects to coastal uses or resources. The Proposed Action would be consistent with the existing land uses in the project area and would not substantially differ from existing military and industrial activities in the project vicinity. Notification of this determination was filed with the CCC on April 20, 2012. The

CCC concurred with Vandenberg AFB's determination in a letter dated July 9, 2012 (refer to Appendix B-4 for details).

4.5.2 Alternative B: Realigned Alternative

Under Alternative B, site development would be similar to Alternative A, but with a slightly different alignment. Impacts associated with land use compatibility and coastal zone resources would be the same as described for Alternative A.

4.5.3 Alternative C: No-Action Alternative

Under the No-Action Alternative, replacing the overhead electrical lines on South Vandenberg AFB would not occur. Therefore, no impacts on land use and coastal zone resources would occur.

4.6 Noise

Noise impacts are based on estimates of the audible increment of noise above a background level. In general, ambient noise levels depend on noise generating activities occurring within a relatively limited geographic area. To the extent that those activities do not change substantially over time, the ambient noise in the area would remain relatively constant, as would the noise baseline.

Pursuant to federal OSHA regulations, employees should not be subject to noise levels exceeding 90 dB $L_{eq[h]}$ for an 8-hour period. Noise levels exceeding 115 dBA are permitted for a maximum of 15 minutes within an 8-hour period. Noise exposure above 115 dBA is not permitted. For this analysis, noise impacts would be considered substantial if they exceeded OSHA standards. As the project site is a restricted area for military/authorized personnel, there are no adjacent sensitive receptors that would be affected by the Proposed Action. Therefore, noise impacts would be limited to onsite military and construction personnel.

4.6.1 Alternative A: Proposed Action

Construction activities associated with the Proposed Action would involve demolition of existing electrical lines, and construction of new overhead electrical lines and access roads. The activities would use standard equipment including trucks, earthmovers (e.g., dozers, scrapers, loaders, excavators), and compressors, over an approximate 12-month period for each line. Typical noise levels of construction equipment are presented in Table 4.6-1. As such, increases in noise associated with the construction activities would be temporary; no long-term construction noise impacts would occur.

Table 4.6-1. Estimated Construction/Demolition Equipment Noise Levels

Equipment	Estimated Noise Level (dBA) at 50-ft
Air compressor	80
Backhoe	80
Compactor (ground)	80
Concrete Mixer Truck	85
Crane, mobile or stationary	85
Dozer	85
Dump Truck	84
Excavator	85
Flat Bed Truck	84
Front End Loader	80
Generator (more than 25 KVA)	82
Grader	85
Jack Hammer	85
Paver	85
Pump	77
Rock Drill	85
Scraper	85

Sources: FHWA 2006; National Cooperative Highway Research Program (1999).

The Proposed Action would temporarily increase ambient noise levels in the project vicinity. Hourly average L_{eq} noise levels were estimated for the Proposed Action based on the types and numbers of equipment anticipated to be onsite during construction. During demolition and construction activities, overall noise levels would result from the combined effect of the noise contributions from multiple pieces of equipment in use at a given time. Construction equipment would generate relatively continuous noise ranging from 77 to 85 dBA at 50 feet from the source (Table 4.6-1).

Estimated noise levels due to proposed construction activities would not result in a substantial increase in noise exceeding OSHA regulations, since noise levels would remain below 90 dB $L_{eq[h]}$. Therefore, no adverse impacts on noise would occur. Proposed annual maintenance activities would be typical of industrial land uses and would not substantially differ from the existing noise environment within the project vicinity. Therefore, annual maintenance activities would not result in a significant increase in noise levels over what currently exists in the project vicinity. Therefore, no adverse impacts on noise would occur.

4.6.2 Alternative B: Realigned Alternative

Potential sound levels produced during demolition, construction, and annual maintenance activities would be identical to Alternative A. Under Alternative B, impacts on noise would be the same as those described for Alternative A.

4.6.3 Alternative C: No-Action Alternative

Under the No-Action Alternative, replacing the overhead electrical lines on South Vandenberg AFB would not occur; therefore, no impacts on noise would occur.

4.7 Public Health and Safety

Potential impacts associated with public health and safety are evaluated using federal,

state, and local regulatory requirements, contract specifications, and Base operating constraints, as outlined in Section 3.7, Public Health and Safety. Hazardous materials management requirements are stipulated in federal and state EPA and OSHA regulations, contract specifications, and the Vandenberg AFB Hazardous Material Management Plan (30 SWP 32-7086).

Non-compliance with applicable regulatory requirements, human exposure to hazardous materials and wastes, or environmental release above permitted limits, would be considered adverse impacts.

4.7.1 Alternative A: Proposed Action

Hazardous Materials and Waste

Compliance with all applicable federal, state, and local rules and regulations would govern all activities associated with the Proposed Action, which would minimize the potential for adverse effects. Specifically, hazardous materials and waste would be regulated by the procedures outlined in the Vandenberg AFB *Hazardous Materials Management Plan*, 30 SWP 32-7086, and Vandenberg AFB *Hazardous Waste Management Plan*, 30 SWP 32-7043A.

Proposed construction activities would require the use of hazardous materials similar to those currently used and managed on Vandenberg AFB. However, only a small number of equipment would be operating at any one time and there would not be a significant increase in the amounts of hazardous materials present on Base. Demolition activities, including removal and disposal of existing creosote-treated wood poles and transformers containing PCBs, would be disposed of in compliance with federal and state EPA and OSHA regulations, the Vandenberg AFB Hazardous Material Management Plan (30 SWP 32-7086), and applicable hazardous waste regulations. Therefore, impacts to hazardous materials and waste management would not be adverse.

Potential adverse effects could result from accidental releases of POLs from vehicle and equipment leaks. All hazardous wastes would be properly managed and disposed of in accordance with applicable federal, state, and local hazardous waste regulations, including the Vandenberg AFB *Hazardous Waste Management Plan* (30 SWP 32-7043A). All hazardous wastes would be managed during release response and clean-up, and no adverse impacts would occur.

Installation Restoration Sites

As described in Section 3.7.3, there are 24 open hazardous release sites, including two IRP sites, 11 AOCs, and 11 AOIs, located within the project area. As various contaminants could be present at these sites, there is a potential that contaminants would be encountered during ground disturbing activities. Consequently, all ground disturbing activities in proximity of hazardous release sites would be monitored to minimize the risks of exposure to soil or groundwater contaminants (refer to Section 2.5, Environmental Protection Measures). However, in the event contamination is discovered during construction activities, the 30 CES/CEA Environmental Restoration Office would be contacted immediately for necessary remedial requirements. In addition, the Proposed Action would comply with all federal regulations governing IRP activities, including the procedures stipulated in the Federal Facilities Site Remediation Agreement. As the Proposed Action would comply with federal regulations that would minimize human exposure to contaminants, no adverse impacts on public health and safety would occur.

Unexploded Ordnance

UXO is known to be located in certain areas of the project site. It is Air Force policy that all construction is coordinated through 30 SW/SEW to determine what level of UXO support is needed. Additionally, the Air Force would provide specialized training to the construction contractor to assist with recognizing potential UXO (refer to Section

2.5, Environmental Protection Measures). All UXO would be removed by authorized personnel.

Federal Health and Safety Requirements

All applicable OSHA requirements and Air Force regulations would be specified in construction contracts and implemented with standard BMPs associated with the Proposed Action. As discussed in Section 2.5, Environmental Protection Measures, a health and safety plan would be implemented and a formally trained individual would be the safety officer and the main point of contact for all job site safety issues. Impacts from potential health risks to construction personnel and the public would not be significant because work would be done by an experienced, licensed contractor and the work would follow an approved health and safety plan. Therefore, adverse impacts associated with environmental health risks should not occur.

Biological hazards, including vegetation (i.e., poison oak and stinging nettle), animals (i.e., insects, spiders, and snakes), disease vectors (i.e., ticks and rodents), and physical hazards (i.e., holes and ditches, uneven terrain, sharp or protruding objects, unstable ground) exist within the project area, and have the potential to adversely impact the health and safety of construction and/or maintenance personnel. Adherence to federal OSHA regulations would minimize the exposure of workers to these hazards. In addition, awareness training would be incorporated into health and safety protocol (refer to Section 2.5, Environmental Protection Measures).

The Proposed Action would include annual maintenance activities along the new overhead electrical line corridor. As there would be no consequential change in the level of maintenance activities compared to existing conditions, adverse impacts on public health and safety would not occur.

4.7.2 Alternative B: Realigned Alternative

Alternative B site preparation would be similar to Alternative A, but with a slightly different alignment, and would result in the same level of potential human exposure to hazardous materials and waste, UXO, and physical and biological hazards. Therefore, impacts to public health and safety would be the same as described for Alternative A.

4.7.3 Alternative C: No-Action Alternative

Under the No-Action Alternative, replacing the overhead electrical lines on South Vandenberg AFB would not occur; therefore, no impacts on public health and safety would occur.

4.8 Transportation

Factors considered in determining whether an alternative would have adverse impacts on transportation include the extent or degree to which implementation of an alternative would:

- Result in a primary roadway no longer being able to service existing traffic demands; or
- Result in traffic to shift to a roadway that was incompatible with those traffic increases (e.g., inadequate pavement structure or design capacity), or could cause potential safety problems.

4.8.1 Alternative A: Proposed Action

Implementation of the Proposed Action would temporarily affect the local roadway network through the delivery of materials during site construction. However, since increases in traffic volumes associated with construction activities would be temporary, no long-term impacts to the regional transportation network would occur.

Heavy construction vehicles would be kept onsite for the duration of their use. Thus, increases in traffic volumes would mainly

result from construction workers traveling to and from the project site and trucks delivering materials to and removing material from the project site.

Traffic impacts during construction are anticipated to be minimal. Anticipated traffic volumes during construction would be within the capacity of surrounding roadways, including Bear Creek Road, Dile Road, Micro Road, Arguello Road, Honda Ridge Road, CDT Access Road, Road N, Coat Road, Ordinance Road, Spin Road, West Ocean Road, Ocean Park Road, Monroe Street, Clark Street, Lompoc Street, Mesa Road, Santa Ynez Ridge Road, and VHF Road. Existing levels of service along these roadways are adequate to accommodate proposed traffic increases during construction. Therefore, no adverse impacts to traffic would occur.

Proposed annual maintenance activities would not substantially increase overall traffic volumes or circulation patterns within the Base. As there would be no consequential change in the level of operational activities associated with the Proposed Action, no adverse impacts would occur.

4.8.2 Alternative B: Realigned Alternative

Alternative B transportation impacts during construction would be similar to Alternative A because the amount of heavy equipment and grading would be relatively the same. Traffic impacts from Alternative B annual maintenance activities would be the same as described for Alternative A.

4.8.3 Alternative C: No-Action Alternative

Under the No-Action Alternative, replacing the overhead electrical lines on South Vandenberg AFB would not occur. Therefore, no impacts on transportation would occur.

4.9 Water Resources

Adverse impacts to water resources would occur if the Proposed Action caused substantial flooding or erosion; reduced surface water quality to creeks, rivers, streams, lakes, or the ocean; or reduced surface or groundwater quality or quantity.

4.9.1 Alternative A: Proposed Action

The Proposed Action would not create any structures that would affect the volumes or patterns of surface flows or increase potentials for flooding within the drainage areas flowing into Cañada Honda Creek, the Santa Ynez River, or the surface drainages (i.e., Lompoc Canyon, Red Roof Canyon, and seven unnamed drainages tributary to Cañada Honda Creek) that traverse the site. However, construction of new access roads would increase the potential for long-term erosion on the project site. Grading and construction activities associated with the Proposed Action would result in temporary soil disturbance, thus increasing the potential for short-term erosion within the immediate drainage area.

Vegetation removal associated with the construction of temporary and permanent access roads would also increase the potential for sediment and runoff from the project site. In addition, the Proposed Action would potentially discharge construction- and maintenance-related waste materials that could affect the quality of surface water downstream from the project site.

The Proposed Action would require coverage under a NPDES Construction General Permit. As stated in Section 2.5, Environmental Protection Measures, the construction contractor would prepare a SWPPP before project implementation, which would require implementation of standard erosion control measures that would prevent or minimize dispersion of soils to surface waters. The SWPPP would include BMPs for erosion and sediment control, non-stormwater (wastewater) management, spill prevention and control, vehicle and equipment fueling and maintenance, solid waste management,

stockpile management, and septic waste management. In addition, the contractor would implement BMPs to minimize dispersion of soils to adjacent surface water bodies (refer to Section 2.5, Environmental Protection Measures).

Implementing measures described in Section 2.5, Environmental Protection Measures, would preclude direct impacts to potential Waters of the U.S. or wetlands. These measures include avoiding construction and vegetation removal within Waters of the U.S. and wetland areas, and monitoring of these areas by a qualified biologist during construction. This avoidance approach would ensure that construction of the Proposed Action would not place dredge or fill material in Waters of the U.S. (refer to Section 2.5, Environmental Protection Measures). Accordingly, a CWA Section 401 Water Quality Certification from the Central Coast RWQCB and CWA Section 404 Permit from the USACE would not be required for the Proposed Action because no direct impacts to water bodies or wetlands would occur.

Erosion

Increased erosion potential during construction could result from demolition of the existing electrical line and poles, grading (cut and fill operations), removal of vegetation, soil compaction by heavy equipment, and offsite transport of soils in vehicle tires. Construction of new access roads would increase the potential for long-term erosion on the project site. As discussed in Section 2.5, Environmental Protection Measures, new roads would be designed and constructed to prevent erosion following a BMP Manual, such as the California Department of Parks and Recreation Off-Highway Vehicle BMP Manual. The Proposed Action would also include implementation of a SWPPP and BMPs to prevent or minimize potential effects to water quality and increased sedimentation in potential Waters of the U.S., including nearby surface drainages (i.e., Cañada Honda Creek and Santa Ynez River) as well as drainages that traverse the project site (e.g., Lompoc

Canyon, Red Roof Canyon, and seven unnamed drainages tributary to Cañada Honda Creek). In addition, access roads would be constructed outside surface water drainages (refer to Section 2.5, Environmental Protection Measures). Vegetation removal would be minimized and avoided in surface water drainages. All heavy equipment would be prohibited in surface water drainages. In most areas, temporary access roads would be stabilized in accordance with NPDES Construction General Permit requirements (i.e., 70 percent vegetation coverage for exposed soil areas). Therefore, erosion-related, water quality impacts of nearby surface drainages would not be adverse with implementation of these project design components and BMPs. Thus, no adverse impacts would occur. Refer to Section 4.4, Geology and Earth Resources, for additional information pertaining to erosion.

Water Quality

Surface water quality impacts, although unlikely, could potentially occur as a result of inadvertent dispersion of contaminants during demolition, construction, and subsequent maintenance. No project activities would occur within any water body, and the amount of construction or maintenance-generated contaminants (such as an oil leak from a vehicle) would be minimal; therefore, any accidental spills would remain localized and small. Nonetheless, demolition and construction activities would require the use of vehicles and equipment powered by diesel fuel/gasoline and lubricated with oil and other mechanical fluids, which are considered hazardous substances. Accidental releases of such substances (e.g., spills arising from leakage of fuel, motor oil, or hydraulic fluid during operation and/or equipment maintenance) also could occur. All hazardous wastes would be properly managed and disposed of in accordance with applicable federal, state, and local hazardous waste regulations, including the Vandenberg AFB Hazardous Waste Management Plan (30 SWP 32-7043A). The contractor would follow a spill prevention and response plan, have

spill kits, and clean-up spills immediately. Any resulting hazardous waste would be properly disposed of in accordance with Vandenberg AFB procedures. Therefore, no adverse impacts on water quality would occur.

Floodplains and Flooding

Portions of the proposed Feeder Line K7 are located at the upland boundary of the Santa Ynez River floodplain. The Proposed Action would necessitate working within this floodplain. Activities that would occur within the floodplain would include demolition and replacement of existing electrical lines and construction of new overhead electrical lines. No access roads would be constructed within the floodplain. Feeder Line K7 is connected to existing infrastructure and facilities that are not feasible to relocate; therefore, no practicable alternative to the Proposed Action is possible.

Because the portions of Feeder Line K7 are situated at the upland boundary of the floodplain, and the size of the individual power poles is small in relation to the extent of the entire floodplain for the Santa Ynez River, proposed activities would not alter the floodplain to a degree that adverse effects would result. Furthermore, the power poles have not impeded flood flows during large flood events, including the 1969 flood along the Santa Ynez River. The floodplain limits in the vicinity of the project area would not be altered by activities associated with the Proposed Action. The 100-year floodplain limit and duration of flooding within the project area would remain approximately the same as those currently present. Through implementation of a SWPPP and incorporation of BMPs into the project design, the Proposed Action would not result in adverse impacts to water resources during demolition, construction, and/or maintenance activities.

4.9.2 Alternative B: Realigned Alternative

Alternative B site preparation would be similar to Alternative A, resulting in the same level of temporary soil disturbance and potential for

short-term erosion within Cañada Honda Creek, the Santa Ynez River, and the surface drainages (i.e., Lompoc Canyon, Red Roof Canyon, and seven unnamed drainages tributary to Cañada Honda Creek) that traverse the site. Demolition, construction, and annual maintenance activities would result in similar water quality impacts associated with the potential discharge of construction- and maintenance-related waste materials. Therefore, impacts to water resources would be the same as described for Alternative A.

4.9.3 Alternative C: No-Action Alternative

Under the No-Action Alternative, replacing the overhead electrical lines on South Vandenberg AFB would not occur; therefore, no impacts on water resources would occur.

4.10 Cumulative Impacts

CEQ regulations implementing NEPA require that the cumulative impacts of a Proposed Action be assessed (40 CFR Parts 1500-1508). A cumulative impact is defined as the following:

“the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” (40 CFR § 1508.7)

CEQ’s guidance for considering cumulative effects states that NEPA documents “should compare the cumulative effects of multiple actions with appropriate national, regional, state, or community goals to determine whether the total effect is significant” (CEQ 1997). The first step in assessing cumulative effects, therefore, involves identifying and defining the scope of other actions and their

interrelationship with the Proposed Action or alternatives. The scope must consider other projects that coincide with the location and timing of the Proposed Action and other actions, and the duration of potential effects on the environment.

4.10.1 Projects Considered in the Cumulative Analysis

For the purposes of this EA, the project vicinity is defined as the area over which effects of the Proposed Action could contribute to cumulative effects. The effect of the Proposed Action on specific resources has been evaluated to include the addition of present and future effects added to those that have occurred in the past. Such cumulative effects have also been added to effects (past, present, and future) caused by all other actions that affect the same resource. A list of existing or reasonably foreseeable projects that would be constructed in the project region is provided in Table 4.10-1.

4.10.2 Cumulative Impact Analysis

Air Quality

Air quality impacts were considered in conjunction with on-going and future projects planned at Vandenberg AFB. As described in Section 4.1, construction activities from Alternative A (Proposed Action) or Alternative B would produce emissions that would remain below applicable emission significance thresholds. Any concurrent emission-generating action that occurs in the project vicinity would potentially contribute to ambient impacts from these emissions. Since the proposed construction activities would produce a nominal amount of emissions, the combination of the proposed construction and future project air quality impacts would not contribute to an exceedance of an ambient air quality standard. As a result, Alternative A and Alternative B would not be cumulatively significant. Thus, there would be no significant cumulative impacts.

Table 4.10-1. Related and Cumulative Projects

Project Title	Project Status
Reactivation of SLC-4E	Approved project, construction underway.
Honda Ridge Equipment Upgrades	Approved project.
Borrow Pits Expansion and Reactivation Project	Approved project.
Repairs and Replacement of Overhead Electrical Line, Feeders N1, N3, and N6	Approved project; anticipated construction in 2012.
Repairs and Replacement of Overhead Electrical Line, Feeders N5, N9, and N10	EA being prepared; anticipated construction 2012.
Repairs and Replacement of Overhead Electrical Line, Feeders K4, K6, and K8	EA being prepared; anticipated construction in 2013.
Basewide Demolition	Programmatic EA being prepared; anticipated construction in 2014.
Joint Functional Component Command for Space Facility	EA being prepared; anticipated construction in 2014.
New 13 th Street Bridge and Demolition of Existing 13 th Street Bridge at the Santa Ynez River Crossing	EA being prepared; anticipated construction in 2014.
Repairs to Honda Ridge Road and Command Transmit Access Road	Qualifies for a CATEX; anticipated construction in 2013.

Biological Resources

Present and reasonably foreseeable projects at Vandenberg AFB (e.g., San Antonio Creek restoration project, borrow pits expansion and reactivation project, and demolition and abandonment of Atlas and Titan facilities), development of the Joint Space Operations Command buildings, Honda Ridge Road repair, and others involving ground disturbing activities such as grading, paving, landscaping, construction of roads and buildings, and related noise and traffic impacts could result in temporary and localized effects to biological resources that would be individually comparable to those associated with Alternative A (Proposed Action) or Alternative B. Similar to these alternatives, implementation of environmental protection measures into the project design and compliance with regulatory consultation requirements would minimize adverse impacts on biological resources. As a result, Alternative A or Alternative B, combined with other past and planned activities, would not result in adverse cumulative impacts on biological resources.

Cultural Resources

Present and reasonably foreseeable projects on Vandenberg AFB (e.g., borrow pits expansion and reactivation project, San Antonio Creek restoration project, and the overhead electrical line, Feeder Line K4, K6, K8 project) involving ground disturbing activities within intact, native soils (i.e., not artificial fill areas) and/or modification and/or

demolition of structures over 50 years of age could result in impacts on cultural resources. Archaeological sites are a limited resource and, therefore, any impact on an archaeological site that qualifies as a historic property may contribute to a cumulative impact. Cumulative construction activities that would potentially disturb unknown, intact subsurface prehistoric or historic archaeological resources would be subject to federal, state, and local regulations that would ensure the preservation and/or recordation of significant cultural resources. Alternative A and Alternative B would include implementation of environmental protection measures described in Section 2.5, Environmental Protection Measures, including installation of temporary exclusionary fencing, prohibiting vehicular access within known cultural sites, and adherence to 36 CFR 800.13 and Vandenberg AFB Integrated Cultural Resources Management Plan procedures in the event previously undocumented cultural resources are discovered during construction activities, and compliance with regulatory consultation requirements.

Realigning the new feeder line route under Alternative B would reduce impacts on cultural resources compared to Alternative A. Relocating the new feeder line route to avoid four NRHP-eligible sites within the project area would ensure the contribution of Alternative B to potentially cumulative impacts on cultural resources would not be adverse.

As a result, Alternative B combined with other cumulative projects, would not result in adverse cumulative impacts on cultural resources.

Geology and Earth Resources

Cumulative projects at Vandenberg involving grading, excavations, and construction/demolition (e.g., overhead electrical line, Feeder Line K project, Honda Ridge equipment upgrades project, and combat information transport system upgrades) could result in erosion-induced sedimentation of adjacent drainages and water bodies. Alternative A (Proposed Action) or Alternative B would include construction activities that would temporarily exacerbate the potential for erosion-induced sedimentation of Cañada Honda Creek, Santa Ynez River, and surface drainages (i.e., Lompoc Canyon, Red Roof Canyon, and seven unnamed drainages tributary to Cañada Honda Creek) that traverse the site. Construction at cumulative project sites involving grading and construction, in combination with construction for Alternative A or Alternative B, would not result in significant cumulative erosional impacts, due to implementation of BMPs, compliance with established plans and policies, and incorporation of standard erosion control measures into the project design.

All projects located on Vandenberg AFB are subject to seismically induced ground shaking due to an earthquake on a local or regional fault. Seismic-related impacts at the project site, in combination with probable future projects, would not be cumulatively significant with incorporation of modern construction engineering and safety standards.

Land Use and Coastal Zone Resources

Implementation of Alternative A (Proposed Action) or Alternative B would not introduce incompatible land uses and would be consistent with guidelines for preservation of natural resources within the coastal zone stipulated in the CZMA. Similarly, construction or operation of related and cumulative projects would be modified during

the project review process to ensure compatibility with existing land uses and consistency with provisions stipulated in the applicable federal, state, and/or local land use management plans. Implementation of Alternative A or Alternative B, in conjunction with development of reasonably foreseeable projects, would not result in any adverse cumulative impacts to land use and coastal zone resources.

Noise

Development throughout Vandenberg AFB, including oak ridge tracking facility upgrades, entry control facilities security upgrades, and reactivation of SLC-4E, would result in intermittent, short-term noise impacts throughout the region. The duration of these localized impacts would be limited to the construction phases of the individual projects. Future construction activities occurring within the region would be subject to the standard measures and conditions regulating construction activities to ensure consistency with OSHA noise standards and guidelines. The contribution of Alternative A (Proposed Action) or Alternative B to incremental short-term construction impacts would not be cumulatively significant, as these activities would be temporary and intermittent. Impacts associated with generating noise at cumulative project sites during construction periods, in combination with construction of Alternative A or Alternative B would not result in significant cumulative impacts, as such impacts are generally localized and confined to the immediate construction area.

Noise generated by annual maintenance activities would be consistent with the existing uses in the project area and would not substantially differ from the existing noise environment within the project vicinity. Therefore, the contribution of Alternative A or Alternative B to cumulative operational noise impacts would not be adverse.

Public Health and Safety

Alternative A (Proposed Action) or Alternative B along with other related projects proposed

at Vandenberg AFB (e.g., reactivation of SLC-4E, borrow pits expansion and reactivation project, and overhead electrical line, Feeder Line K project) could result in increased risks to public health and safety. Cumulative construction and operational activities occurring within the region would be subject to federal, state, and local guidelines regulating public health and safety and hazardous materials. Construction activities associated with Alternative A or Alternative B would occur at a military facility with limited public access. Impacts from these alternatives to public safety and environmental health would not be significant because the risks to demolition/construction workers, potentials for offsite dispersion of contaminants, and future exposure to residual onsite contamination would be minimal and likely confined to the immediate project site. Implementation of Alternative A or Alternative B, in conjunction with development of reasonably foreseeable projects, would not result in any adverse cumulative impacts to public health and safety. Thus, there would be no significant impacts.

Transportation

Cumulative project buildout on Vandenberg AFB would result in additional traffic volumes within the region. Cumulative project-related auto and truck traffic could utilize streets and intersections in the project vicinity, as well as those streets that would be used by project-related construction traffic (i.e., equipment and commuting workers). Cumulative projects would generate increased levels of vehicular activity that would increase traffic trips on the local roadway network. Alternative A (Proposed Action) or Alternative B would temporarily affect the local roadway network during project construction due to minor, short-term increases in truck and equipment traffic. However, anticipated traffic volumes during construction would be within the capacity of surrounding roadways and existing levels of service along these roadways would be adequate to accommodate proposed traffic increases during construction. Proposed annual

maintenance activities would not substantially increase traffic entering the project site. Given the minimal, short-term increases in traffic, the contribution of Alternative A or Alternative B to cumulative traffic impacts would not be significant. As a result, the Proposed Action, combined with other cumulative projects, would not result in adverse cumulative impacts on transportation. Thus, there would be no significant impacts.

Water Resources

Cumulative development within or adjacent to water bodies could result in temporary and localized effects to water quality. Implementation of Alternative A (Proposed Action) or Alternative B would not result in adverse impacts to water resources. Significant surface water and groundwater quality impacts would not occur as a result of construction-induced erosion or contamination. In addition, Alternative A or Alternative B would not result in increased flooding potential onsite or offsite. Less than significant impacts resulting from these alternatives, when added to the impacts from the other related and cumulative projects, would not result in associated adverse cumulative impacts.

Summary

In summary, Vandenberg AFB includes environmental contract specifications and environmental protection measures into all projects to ensure that no adverse cumulative impacts result from development projects. Projects are reviewed and modified, as necessary, during the NEPA planning process to ensure adverse impacts are avoided or minimized to the extent feasible. As all Vandenberg AFB projects are designed and implemented in compliance with applicable statutes and regulations and environmental protection measures are developed in coordination with the appropriate regulatory agencies, impacts associated with Alternative A (Proposed Action) or Alternative B, when added to the impacts from other related and cumulative projects, would not result in significant cumulative impacts.

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Woods, Christopher, GIS Manager, SAIC

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Chapter 6. List of Agencies, Organizations, and Persons Contacted

California Coastal Commission, San Francisco, CA

California Native Plant Society, Los Osos, CA

California Regional Water Quality Control Board, Central Coast Region, San Luis Obispo, CA

California State Historic Preservation Officer, Sacramento, CA

Environmental Defense Center, Santa Barbara, CA

La Purisima Audubon Society, Lompoc, CA

Lompoc Public Library, Lompoc, CA

Santa Barbara County Air Pollution Control District, Project Review, Santa Barbara, CA

Santa Barbara Museum of Natural History, Santa Barbara, CA

Santa Barbara Public Library, Santa Barbara, CA

Santa Maria Public Library, Santa Maria, CA

Santa Ynez Band of Chumash Indians, Tribal Elders Council, Santa Ynez, CA

University of California, Library, Santa Barbara, CA

United States Fish and Wildlife Service, Ventura Field Office, Ventura, CA

Vandenberg Air Force Base Library, Vandenberg AFB, CA

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Chapter 7. References

- Alterman, I.B., R.B. McMullen, L.S. Cluff, and D.B. Slemmons (eds). 1994. Seismotectonics of Central California Coast Ranges. Geological Society of America Special Paper 292.
- APLIC. 2006. Suggested Practices for Avian Protection on Power Lines : The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, California.
- Arnold, Jeanne. 1992. Complex Hunter-Gatherer-Fishers of Prehistoric California: Chiefs, Specialists, and Maritime Adaptations of the Channel Islands. *American Antiquity* 57:60–84.
- Arnold, R.A. 1983. Ecological studies of six endangered butterflies (Lepidoptera: Lycaenidae): island biogeography, patch dynamics, and the design of habitat preserves. Univ. of Calif. Publ. in Entomology. 99:1-161.
- . 1981. A review of endangered species legislation in the USA and preliminary research on 6 endangered California butterflies. *Beih. Veroff. Naturschutz. Landschaftspflege Bad.-Wurt.* 21: 79-96.
- . 1978. Status of six endangered California butterflies, 1977. California Dept. of Fish & Game, Nongame Wildlife Investigations #-1-1, Study V, Job 2.20. Sacramento, CA. 95 pp.
- Benson, Foley. 1969. *Archaeological Survey of Sudden Flats and Associated Canyons, Vandenberg Air Force Base*. University of California, Santa Barbara, Paper of Anthropology 183 (VAFB 1969-01).
- Brasket, Kelli S. 2011. Identification of Historic Properties and Assessment of Adverse Effects for K1, K4, K6, K7, and K8 Feeder Line Replacement Project, Vandenberg Air Force Base, Santa Barbara County, California. XUMU930311. December.
- Bulger, J.B., N.J. Scott, and R.B. Seymour. 2003. Terrestrial activity and conservation of adult California red-legged frogs *Rana aurora draytonii* in coasta forest and grasslands. *Biological Conservation* 110(1):85-95.
- California EPA (Environmental Protection Agency). 2006. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. March. Website: http://www.climatechange.ca.gov/research/2008_assessment/index.html.
- California Department of Water Resources. 2003. Basins and Subbasins of the Central Coast Hydrologic Region, Santa Ynez River Valley Groundwater Basin. DWR Bulletin 118. http://www.water.ca.gov/groundwater/bulletin118/central_coast.cfm.
- CARB (California Air Resources Board). 2010b. *Area Designations Maps/State and National*. Website: <http://www.arb.ca.gov/desig/adm/adm.htm>.
- . 2006a. Off-Road Emissions Inventory Program. OFFROAD2007. December 15, 2006. Website: <http://www.arb.ca.gov/msei/offroad/offroad.htm>.

- _____. 2006b. EMFAC2007 Release. November 2006. Website:
http://www.arb.ca.gov/msei/onroad/latest_version.htm.
- Carbone, Larry. 1998. *Phase I, II, and III Archaeological Surveys for Cultural Resources Inventory, Vandenberg Air Force Base, Santa Barbara County, California*. Science Applications International Corporation and Chambers Group, Inc., Santa Barbara, California. Submitted to US Department of the Interior, National Park Service, Western Region Interagency Archeological Services Branch, San Francisco (VAFB 1998-03).
- CDMG (California Division of Mines and Geology). 1999. *Fault Rupture Hazard Zones in California*. Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zone Maps. Special Publication 42. Sacramento, CA.
- _____. 1994. Fault Activity Map of California and Adjacent Areas, with Locations and Ages of Recent Volcanic Eruptions, compiled by C.W. Jennings.
- Christopher, S.V. 2002. Sensitive Amphibian Inventory at Vandenberg Air Force Base, Santa Barbara County, California. Summary of Preliminary Results and Site Maps. Appendix A Field Survey Data January 1995 through March 2002.
- Dibblee, T.W. 1988. Geologic Map of the Tranquillon Mountains and Point Arguello Quadrangles Santa Barbara County, California. Dibblee Geological Foundation Map #DF-19.
- _____. 1950. Geology of Southwestern Santa Barbara County, California: Point Arguello, Lompoc, Point Conception, Los Olivos, and Gaviota Quadrangles. California Division of Mines Bulletin 150. California Department of Natural Resources, San Francisco.
- Enright, Erin A., Leeann G. Haslouer, and Clay G. Lebow. 2011. Archaeological Investigations in Support of Section 106 Compliance for K1, K4, K6, K7, and K8 Electrical Feeder Lines, Vandenberg Air Force Base, Santa Barbara County, Ca.
- Environmental Solutions, Inc. 1988. *Archaeological Resources Inventory and No Effects Determination for Proposed Phase III Geotechnical Testing, Vandenberg Proposed Space Launch Complex 7, Air Force Base, Santa Barbara County, California*. Prepared for United States Air Force, El Sugundo, California. (VAFB-1988-19).
- Eriksen, C.H., and D. Delk. 1999. Fairy Shrimps of California's Puddles, Pools, and Playas. Mad River Press, Eureka, CA.
- Erlandson, Jon M. 1994. Early Hunter-Gatherers of the California Coast. Plenum, New York.
- Erlandson, Jon M., and Kevin Bartoy. 1996. Protohistoric California: Paradise or Pandemic? Proceedings of the Society for California Archaeology 9:304–309.
- _____. 1995. Cabrillo, the Chumash, and Old World Diseases. Journal of California and Great Basin Anthropology 17:153–173.

- Ferraro, David, Kathleen Bergin, Jerry Moore, Sandra Day-Moriarty, and Jeffry Parsons. 1988. *Survey, Testing, and Evaluation of Fourteen Sites for the STS Power Plant No. 6 Natural Gas Pipeline Project, Santa Barbara County, California*. Harmsworth Associates Research Report No. 4. Harmsworth Associates, Laguna Hills, California. Submitted to Martin Marietta Corporation, Vandenberg Air Force Base, California (VAFB-1988-12).
- Glassow, Michael. 1996. *Purisimeño Chumash Prehistory: Maritime Adaptations along the Southern California Coast*. Case Studies in Archaeology. Jeffrey Quilter, series editor. Harcourt Brace College Publishers, San Diego.
- _____. 1990. *Archaeological Investigations on Vandenberg Air Force Base in Connection with the Development of Space Transportation System Facilities*, with contributions by Jeanne E. Arnold, G. A. Batchelder, Richard T. Fitzgerald, Brian K. Glenn, D. A. Guthrie, Donald L. Johnson, and Phillip L. Walker. Department of Anthropology, University of California, Santa Barbara. Submitted to US Department of the Interior, National Park Service, Western Region Interagency Archeological Services Branch, San Francisco, Contract No. CX-8099-2-0004.
- Glassow, Michael, Laurence Spanne, and Jeffrey Quilter. 1976. *Evaluation of Archaeological Sites on Vandenberg Air Force Base, Santa Barbara County, California*. Department of Anthropology, University of California, Santa Barbara. Submitted to the US Department of the Interior, National Park Service, Office of Archaeology, San Francisco, Contract No. CX800040020 (VAFB-1976-01).
- Greenwood, Roberta. 1978. Obispeño and Purisimeño Chumash. In *California*, edited by Robert F. Heizer, pp. 520–523. Handbook of North American Indians, vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.
- _____. 1972. *9000 Years of Prehistory at Diablo Canyon, San Luis Obispo County, California*. San Luis Obispo County Archaeological Society Occasional Paper No. 7.
- Helm, B.P. 1998. Biogeography of Eight Large Branchiopods Endemic to California. Pages 124–139 in C.W. Witham, E.T. Bauder, D. Belk, W.R. Ferren Jr., R. Ornduff, editors. Ecology, Conservation, and Management of Vernal Pool Ecosystems. California Native Plant Society, Sacramento, California.
- Jaffke, Todd. 1990. *Archaeology Survey Report, Waterline Replacement on South Vandenberg Air Force Base, California*. On file, 30th Civil Engineer Squadron, Cultural Resources Section, Vandenberg Air Force Base, California. (VAFB-1990-07).
- Jennings, C.W. 1994. Fault map of California and adjacent areas. California Division of Mines and Geology. California Geological Data Map Series, Map No. 6, Scale 1:750,000.
- King, Chester. 1990. *Evolution of Chumash Society: A Comparative Study of Artifacts Used for Social System Maintenance in the Santa Barbara Channel Region before A.D. 1804*. The Evolution of North American Indians, edited by David Hurst Thomas. Garland, New York.
- _____. 1984. Ethnohistoric Background. In *Archaeological Investigations on the San Antonio Terrace, Vandenberg Air Force Base, California, in Connection with MX Facilities Construction*, pp. I-1–I-54. Chambers Consultants and Planners, Stanton, California. Submitted to US Army Corps of Engineers, Los Angeles District, Contract No. DAC09-81-C-0048.

- _____. 1981. *The Evolution of Chumash Society: A Comparative Study of Artifacts Used in Social System Maintenance in the Santa Barbara Channel Region before A.D. 1804*. Ph.D. dissertation, Department of Anthropology, University of California, Davis.
- King, Chester, Robert Gibson, Jack Hunter, Kay Martin, Lois Roberts, and Larry Wilcoxon. 1985. Cultural Resources. In *Union Oil Project/Exxon Project Shamrock and Central Santa Maria Basin Area Study EIS/EIR*, Technical Appendix G. Arthur D. Little, Inc., Santa Barbara, California. Prepared for County of Santa Barbara US Minerals Management Service, California State Lands Commission, and California Office of Offshore Development (VAFB-1985-25).
- Landberg, Leif. 1965. *The Chumash Indians of Southern California*. Southwest Museum Papers No. 19. Los Angeles.
- Lebow, Clayton G., Rebecca L. McKim, Douglas R. Harro, Ann M. Munns, and Carole Denardo. 2007. *Littoral Adaptations throughout the Holocene: Archaeological Investigations at the Honda Beach Site (CA-SBA-530), Vandenberg Air Force Base, Santa Barbara County, California*. 2 vols. Applied EarthWorks, Inc., Lompoc, California. Submitted to 30th Civil Engineer Squadron, Environmental Flight (30 CES/CEVNC), Vandenberg Air Force Base, California.
- Lebow, Clayton G., Rebecca L. McKim, Douglas R. Harro, and Ann M. Munns. 2006. *Prehistoric Land Use in the Casmalia Hills throughout the Holocene: Archaeological Investigations along Combar Road, Vandenberg Air Force Base, California*. 2 vols. Applied EarthWorks, Inc., Lompoc, California. Submitted to 30th Civil Engineer Squadron, Environmental Flight (30 CES/CEVNC), Vandenberg Air Force Base, California.
- Lebow, Clayton, Douglas Harro, and Dina Coleman. 2002. *Archaeological Investigations in Support of the Coast Road Waterline Replacement Project, Vandenberg Air Force Base, Santa Barbara County, California*. Applied EarthWorks, Inc., Fresno, California. Submitted to 30 CES/CEV, Vandenberg Air Force Base, California, USAF Contract No. T0900DF415.
- Lebow, Clayton, Douglas Harro, Rebecca McKim, and Carole Denardo. 2001. *Archaeological Excavations at CA-SBA-246, An Early Holocene Site on Vandenberg Air Force Base, Santa Barbara County, California*. Applied EarthWorks, Inc., Fresno, California, for Tetra Tech, Inc., Santa Barbara, California. Submitted to 30 CES/CEV, Vandenberg Air Force Base, California, USAF Contract No. F04684-95-C-0045.
- Mattoni, R.H.T. 1992. The endangered El Segundo blue butterfly. *Journal of Research Lepidoptera* vol. 29. 277-304pp.
- Moratto, Michael J. 1984. *California Archaeology*. Academic Press, New York and London.
- National Oceanic and Atmospheric Administration. 2011. Period of Record Monthly Climate Summary – Lompoc, California (045064). Period of Record: July 1, 1950 to December 31, 2005. Website: <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?calomp+sca>.
- Neff, Hector, and Pandora Snethkamp. 1982. *VAFB, CA 1982 Fuels Management Program, Cultural Resources Survey/Evaluation*. 30 CES/30CEVPC, Vandenberg Air Force Base, California (VAFB-1982-05).

- Nowlan, Patrick, Sheila Ellsworth, Roy McCullough, Mira Metzinger, Jim Gorski, and Andy Bonhert. 1996. *Cold War Properties Evaluation—Phase I, Inventory and Evaluation of Launch Complexes and Related Facilities at Vandenberg Air Force Base, California, for the United States Air Force*. Tri-Services Cultural Resources Research Center, US Army Construction Engineering Research Laboratories, Champaign, Illinois. Prepared for US Department of Defense Legacy Resource Management Program, Washington, D.C.
- Palmer, Kevin (Lex). 1999. *Central Coast Continuum—From Ranchos to Rockets: A Contextual Historic Overview of Vandenberg Air Force Base, Santa Barbara County, California*. Prepared by Palmer Archaeology and Architecture Associates, Santa Barbara, California. Draft submitted to 30 CES/CEVPC, Vandenberg Air Force Base, California.
- Peterson, Robert, Jerry D. Moore, and Roger H. Colten. 1984. Phase I Archaeological Survey of a Proposed Powerline Right-of-Way and Two Alternative Pipeline Routes, Lompoc, California. Office of Public Archaeology, Social Process Research Institute, University of California, Santa Barbara (VAFB 1984-31).
- Pratt, Gordon F. 2006. Terrestrial Arthropods of Vandenberg Air Force Base, Lompoc, California 2004-2005 Draft. Prepared by SRS Technologies for 30 CES/CEVNN [now CEANC], Vandenberg AFB, California. 106pp.
- Pratt, G.F. and G.R. Ballmer. 1993. Correlations of diapause intensities of *Euphilotes* spp. and *Philotiella speciosa* (Lepidoptera:Lycaenidae) with host bloom period and elevation. *Ann. Ent. Soc.* 86: 265-272.
- Preston, William. 1996. Serpent in Eden: Dispersal of Foreign Diseases into Pre-Mission California. *Journal of California and Great Basin Anthropology* 18:2–37.
- Spanne, Laurence W. (Larry). 1980. *An Archaeological Evaluation of the Space Transportation System 69 kV Transmission Line (V-86), Vandenberg Air Force Base, Santa Barbara County, California*. VTN Consolidated, Inc., Irvine, California. Prepared for Ralph M. Parsons Company, Pasadena, California. Submitted to 30 CES/CEVPC, Vandenberg Air Force Base, California (VAFB-1980-07).
- SRS Technologies. 2006. Special-status Crustacean Surveys at Vandenberg Air Force Base, Santa Barbara County, California, November 2004-April 2006. 23 October. 20 pp.
- Thorson, P.H., J.K. Francine, E.A. Berg, L.E. Fillmore, and D.A. Eidson. 2001. Acoustic Measurement of the 21 September 2000 Titan II G-13 Launch and Quantitative Analysis of Behavioral Responses for Selected Pinnipeds on Vandenberg Air Force Base, CA. SRS Technologies technical report submitted to USAF and NMFS. 29pp.
- USAF (United States Air Force). 1987. Mineral resource management plan: Potential exploration, development, and production of oil and gas resources, Vandenberg Air Force Base.
- United States Department of Agriculture, Soil Conservation Service. 1972. Soil Survey of Northern Santa Barbara Area, California.
- USEPA (United States Environmental Protection Agency). 2010. Region 9 Air Programs – Air Quality Maps. Website: <http://www.epa.gov/region09/air/maps>.

- _____. 1995. Compilation of Air Pollutant Emission Factors, AP-42, Volume I. Section 13.2.3, Heavy Construction Operations. Website:
<http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s02-3.pdf>.
- USFWS (United States Fish and Wildlife Service). 2011. Biological Opinion for Replacement of Three Electrical Distribution Lines on South Vandenberg Air Force Base, Santa Barbara County, California (8-8-11-F-16). May 4.
- Vandenberg Air Force Base (AFB). 2011. Integrated Natural Resources Management Plan: 2010-2014.
- _____. 2010. Biological Assessment: Potential Effects to Beach layia, California red-legged frog, El Segundo blue butterfly and Gaviota tarplant. Repair/Replace Overhead Distribution Lines N1/N3/N6 of Electrical Infrastructure at Vandenberg Air Force Base, Santa Barbara County, California. Prepared by 30th Space Wing Asset Management Flight, 30 CES/CEAN. November.
- _____. 2009. Vandenberg Air Force Base General Plan. Section 7 (Land Use and Transportation). 54pp.
- Westec Services, Inc. 1985. Final Report, Archaeological Survey, Testing and Evaluation, STS Power Plant No. 6, Natural Gas Pipeline, Vandenberg Air Force Base, Santa Barbara County, California. WESTEC Services, Inc., Tustin, California (VAFB-1985-03).
- _____. 1984. *Final Report, Vandenberg Air Force Base, California, 1983 Fuels Management Project, Phase II Cultural Resource Survey-Evaluation*. WESTEC Services, Inc., Tustin, California. Submitted to US Department of the Interior, National Park Service, Interagency Archeological Services Branch, San Francisco, in partial fulfillment of Contract No. CX 800-3-0030 (VAFB-1984-02).

Appendix A

Air Quality Emissions Calculations

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Appendix A - Air Emission Calculations for Repairs/Replacement of Electrical Feeder Lines K1 and K7 - VAFB.

Table A-1. Equipment Usage Data for Repairs/Replacement of Electrical Feeder Line K1 on VAFB.

Table A-2. Equipment Usage Data for Repairs/Replacement of Electrical Feeder Line K7 on VAFB.

Table A-3. Air Emission Factors for Repairs/Replacement of Electrical Feeder Lines K1 and K7 on VAFB.

Table A-4. Annual Emissions from Repairs/Replacement of Electrical Feeder Line K1 on VAFB.

Table A-5. Annual Emissions from Repairs/Replacement of Electrical Feeder Line K7 on VAFB.

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Table A-1. Equipment Usage Data for Repairs/Replacement of Electrical Feeder Line K1 on VAFB.

Activity/Equipment Type	Power Rating (Hp)	Load Factor	# Active	Hourly Hp-Hrs	Hours Per Day	Daily Hp-Hrs	Work Days	Total Hp-Hrs
<i>Clear Right of Way</i>								
Brush Cutter	60	0.50	1	30	8	240	11	2,640
Loader - 2 CY	110	0.60	1	66	6	396	11	4,356
Water Truck	175	0.25	1	44	4	175	11	1,925
Fugitive Dust (1)			0.75				11	8
<i>Construct New Access Roads</i>								
Bulldozer - D6	165	0.55	1	91	8	726		-
Grader	150	0.40	1	60	8	480		-
Water Truck	175	0.25	1	44	4	175		-
Fugitive Dust (1)			1.0					-
<i>Haul New Line Poles</i>								
Flat Bed Truck (2)			1		150		41	6,100
<i>Erect New Line Poles</i>								
Heavy Line Truck (2)			1		25		244	6,100
Boom/Crane Truck	190	0.30	1	57	4	228	244	55,632
<i>Install Conductors/insulators</i>								
Bucket/Truck			1		20		244	4,880
Heavy Line Truck			1		10		244	2,440
Boom/Crane Truck	190	0.30	1	57	2	114	244	27,816
3 Drum Sock Line Puller	150	0.62	1	93	5	465	13	5,972
Bull Wheel Puller	263	0.62	1	163	5	814	13	10,450
Static Truck/Tensioner			1		20		244	4,880
Backhoe/Loader	120	0.55	1	66	2	132	244	32,208
Materials Truck - Deliveries (2)			1		150		20	3,050
<i>Remove Existing Conductor</i>								
Bucket Truck			1		15		46	693
Boom/Crane Truck	190	0.30	1	57	4	228	46	10,534
Bull Wheel Puller	263	0.62	1	163	3	488	46	22,557
Static Truck/Tensioner			1		25		46	1,155
<i>Remove Existing Wood Poles</i>								
Bucket Truck			1		25		46	1,155
Boom/Crane Truck	190	0.30	1	57	4	228	46	10,534
Auger/Line Truck w/Compressor	210	0.48	1	101	4	403	46	18,628
Flat Bed Truck (2)			1		40		46	1,848
Dump Truck			1		30		46	1,386
Backhoe/Loader	120	0.55	1	66	3	198	46	9,148

Notes: (1) # active = acres disturbed/day and Total Hp=Hrs = total acre-days.

(2) Hours/Day = miles/roundtrip, Work Days = total trips, and Total Hp-Hrs = total miles.

Table A-2. Equipment Usage Data for Repairs/Replacement of Electrical Feeder Line K7 on VAFB.

Activity/Equipment Type	Power Rating (Hp)	Load Factor	# Active	Hourly Hp-Hrs	Hours Per Day	Daily Hp-Hrs	Work Days	Total Hp-Hrs
<i>Clear Right of Way</i>								
Brush Cutter	60	0.50	1	30	8	240	10	2,400
Loader - 2 CY	110	0.60	1	66	6	396	10	3,960
Water Truck	175	0.25	1	44	4	175	10	1,750
Fugitive Dust (1)			0.75				10	8
<i>Construct New Access Roads</i>								
Bulldozer - D6	165	0.55	1	91	8	726		-
Grader	150	0.40	1	60	8	480		-
Water Truck	175	0.25	1	44	4	175		-
Fugitive Dust (1)			1.0					-
<i>Haul New Line Poles</i>								
Flat Bed Truck (2)			1		150		44	6,625
<i>Erect New Line Poles</i>								
Heavy Line Truck (2)			1		25		265	6,625
Boom/Crane Truck	190	0.30	1	57	4	228	265	60,420
<i>Install Conductors/insulators</i>								
Bucket/Truck			1		20		265	5,300
Heavy Line Truck			1		10		265	2,650
Boom/Crane Truck	190	0.30	1	57	2	114	265	30,210
3 Drum Sock Line Puller	150	0.62	1	93	5	465	14	6,486
Bull Wheel Puller	263	0.62	1	163	5	814	14	11,350
Static Truck/Tensioner			1		20		265	5,300
Backhoe/Loader	120	0.55	1	66	2	132	265	34,980
Materials Truck - Deliveries (2)			1		150		22	3,313
<i>Remove Existing Conductor</i>								
Bucket Truck			1		15		43	639
Boom/Crane Truck	190	0.30	1	57	4	228	43	9,713
Bull Wheel Puller	263	0.62	1	163	3	488	43	20,799
Static Truck/Tensioner			1		25		43	1,065
<i>Remove Existing Wood Poles</i>								
Bucket Truck			1		25		43	1,065
Boom/Crane Truck	190	0.30	1	57	4	228	43	9,713
Auger/Line Truck w/Compressor	210	0.48	1	101	4	403	43	17,176
Flat Bed Truck (2)			1		40		43	1,704
Dump Truck			1		30		43	1,278
Backhoe/Loader	120	0.55	1	66	3	198	43	8,435
<i>Install Underground Cable and Ductbank</i>								
Backhoe/Loader	92	0.30	1	28	6	166	5	828
Paving Machine	110	0.48	1	53	8	422	1	422
Roller	80	0.48	1	38	8	307	1	307
Fugitive Dust (1)			0.25				6	1.50
Concrete Truck - 9 CY (2)			1		40		5	200
Materials Truck - Deliveries (2)			1		150		1	150
Paving Truck - 20 CY (2)			1		40		2	80

Notes: (1) # active = acres disturbed/day and Total Hp=Hrs = total acre-days.

(2) Hours/Day = miles/roundtrip, Work Days = total trips, and Total Hp-Hrs = total miles.

Table A-3. Air Emission Factors for Repairs/Replacement of Electrical Feeder Lines K1 and K7 on VAFB.

Project Year/Source Type	Fuel Type	Emission Factors (Grams/Horsepower-Hour)							References
		VOC	CO	NOx	SOx	PM10	PM2.5	CO2	
Year 2011									
Off-Road Equipment - 51-120 Hp	D	0.63	2.35	3.85	0.01	0.33	0.30	568	(1)
Off-Road Equipment - 121-175 Hp	D	0.45	2.01	3.53	0.01	0.20	0.18	568	(1)
Off-Road Equipment - 176-250 Hp	D	0.33	0.95	3.37	0.01	0.12	0.11	568	(1)
Off-Road Equipment - 251-500 Hp	D	0.28	1.05	2.85	0.01	0.10	0.09	568	(1)
On-road Truck - 5 mph (Gms/Mi)	D	3.55	7.79	14.96	0.02	0.80	0.74	3,845	(2)
On-road Truck - 25 mph (Gms/Mi)	D	0.54	2.47	7.13	0.01	0.25	0.23	2,043	(2)
On-road Truck - 55 mph (Gms/Mi)	D	0.32	1.41	7.86	0.01	0.19	0.18	1,662	(2)
On-Road Trucks - Composite (Gms/Mi)	D	0.52	1.94	8.07	0.01	0.23	0.21	1,847	(3)
Fugitive Dust (Lbs/acre-day)	---	---	---	---	---	27.3	2.7	---	(4)

Notes: (1) Statewide average emission factors estimated by the OFFROAD2007 model and obtained from URBEMIS2007 for year 2011 (Jones&Stokes Ass. 2007).

(2) Heavy duty diesel and light duty truck running emission factors developed from EMFAC2007 for year 2011 (ARB 2006). Units in grams/mile.

(3) Composite factors based on a round trip of 75% at 55 mph, 20% at 25 mph, and 5% at 5 mph. Units in grams/mile. These factors apply to the flatbed and materials truck trips. All other on-road truck usages evaluated with 25 mph emission factors.

(4) Units in lbs/acre-day (AP-42 Section 11.2.3 [USEPA 1995]) and based upon 22 work days/month and a PM10/PM fraction of 0.5.

Factors reduced by 50% from uncontrolled levels to simulate use of standard dust control measures.

Table A-4. Annual Emissions from Repairs/Replacement of Electrical Feeder Line K1 on VAFB.

Location/Equipment Type	Tons per Year						
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
<i>Clear Right of Way</i>							
Brush Cutter	0.00	0.01	0.01	0.00	0.00	0.00	1.65
Loader - 2 CY	0.00	0.01	0.02	0.00	0.00	0.00	2.73
Water Truck	0.00	0.00	0.01	0.00	0.00	0.00	1.21
Fugitive Dust					0.11	0.01	
Subtotal	0.01	0.02	0.04	0.00	0.11	0.01	5.59
<i>Construct New Access Roads</i>							
Bulldozer - D6							
Grader							
Water Truck							
Fugitive Dust							
Subtotal							
<i>Haul New Line Poles</i>							
Flat Bed Truck	0.00	0.01	0.05	0.00	0.00	0.00	12.42
<i>Erect New Line Poles</i>							
Heavy Line Truck	0.00	0.02	0.05	0.00	0.00	0.00	13.74
Boom/Crane Truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal	0.00	0.02	0.05	0.00	0.00	0.00	13.74
<i>Install Conductors</i>							
Bucket/Truck	0.00	0.01	0.04	0.00	0.00	0.00	10.99
Heavy Line Truck	0.00	0.01	0.02	0.00	0.00	0.00	5.49
Boom/Crane Truck	0.01	0.03	0.10	0.00	0.00	0.00	17.42
3 Drum Sock Line Puller	0.00	0.01	0.02	0.00	0.00	0.00	3.74
Bull Wheel Puller	0.00	0.01	0.03	0.00	0.00	0.00	6.54
Static Truck/Tensioner	0.00	0.01	0.04	0.00	0.00	0.00	10.99
Backhoe/Loader	0.02	0.08	0.14	0.00	0.01	0.01	20.17
Flat Bed Truck	0.00	0.01	0.03	0.00	0.00	0.00	6.21
Subtotal	0.05	0.18	0.42	0.00	0.02	0.02	81.55
<i>Remove Existing Conductor</i>							
Bucket Truck	0.00	0.00	0.01	0.00	0.00	0.00	1.56
Boom/Crane Truck	0.00	0.01	0.04	0.00	0.00	0.00	6.60
Bull Wheel Puller	0.01	0.03	0.07	0.00	0.00	0.00	14.12
Static Truck/Tensioner	0.00	0.00	0.01	0.00	0.00	0.00	2.60
Subtotal	0.01	0.04	0.12	0.00	0.00	0.00	24.88
<i>Remove Existing Wood Poles</i>							
Bucket Truck	0.00	0.00	0.01	0.00	0.00	0.00	2.60
Boom/Crane Truck	0.00	0.01	0.04	0.00	0.00	0.00	6.60
Auger/Line Truck w/Compressor	0.01	0.02	0.07	0.00	0.00	0.00	11.66
Flat Bed Truck	0.00	0.00	0.02	0.00	0.00	0.00	3.76
Dump Truck	0.00	0.00	0.01	0.00	0.00	0.00	3.12
Backhoe/Loader	0.01	0.02	0.04	0.00	0.00	0.00	5.73
Subtotal	0.02	0.07	0.18	0.00	0.01	0.01	33.47
Total Emissions - K1	0.09	0.33	0.86	0.00	0.15	0.05	171.64

Table A-5. Annual Emissions from Repairs/Replacement of Electrical Feeder Line K7 on VAFB.

Location/Equipment Type	Tons per Year						
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
<i>Clear Right of Way</i>							
Brush Cutter	0.00	0.01	0.01	0.00	0.00	0.00	1.50
Loader - 2 CY	0.00	0.01	0.02	0.00	0.00	0.00	2.48
Water Truck	0.00	0.00	0.01	0.00	0.00	0.00	1.10
Fugitive Dust					0.10	0.01	
Subtotal	0.01	0.02	0.03	0.00	0.10	0.01	5.08
<i>Construct New Access Roads</i>							
Bulldozer - D6							
Grader							
Water Truck							
Fugitive Dust							
Subtotal							
<i>Haul New Line Poles</i>							
Flat Bed Truck	0.00	0.01	0.06	0.00	0.00	0.00	13.49
<i>Erect New Line Poles</i>							
Heavy Line Truck	0.00	0.02	0.05	0.00	0.00	0.00	14.92
Boom/Crane Truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal	0.00	0.02	0.05	0.00	0.00	0.00	14.92
<i>Install Conductors</i>							
Bucket/Truck	0.00	0.01	0.04	0.00	0.00	0.00	11.94
Heavy Line Truck	0.00	0.01	0.02	0.00	0.00	0.00	5.97
Boom/Crane Truck	0.01	0.03	0.11	0.00	0.00	0.00	18.91
3 Drum Sock Line Puller	0.00	0.01	0.03	0.00	0.00	0.00	4.06
Bull Wheel Puller	0.00	0.01	0.04	0.00	0.00	0.00	7.11
Static Truck/Tensioner	0.00	0.01	0.04	0.00	0.00	0.00	11.94
Backhoe/Loader	0.02	0.09	0.15	0.00	0.01	0.01	21.90
Flat Bed Truck	0.00	0.01	0.03	0.00	0.00	0.00	6.75
Subtotal	0.05	0.19	0.46	0.00	0.02	0.02	88.57
<i>Remove Existing Conductor</i>							
Bucket Truck	0.00	0.00	0.01	0.00	0.00	0.00	1.44
Boom/Crane Truck	0.00	0.01	0.04	0.00	0.00	0.00	6.08
Bull Wheel Puller	0.01	0.02	0.07	0.00	0.00	0.00	13.02
Subtotal	0.01	0.04	0.11	0.00	0.00	0.00	20.54
<i>Remove Existing Wood Poles</i>							
Bucket Truck	0.00	0.00	0.01	0.00	0.00	0.00	2.40
Boom/Crane Truck	0.00	0.01	0.04	0.00	0.00	0.00	6.08
Auger/Line Truck w/Compressor	0.01	0.02	0.06	0.00	0.00	0.00	10.75
Flat Bed Truck	0.00	0.00	0.02	0.00	0.00	0.00	3.47
Dump Truck	0.00	0.00	0.01	0.00	0.00	0.00	2.88
Backhoe/Loader	0.01	0.02	0.04	0.00	0.00	0.00	5.28
Subtotal	0.02	0.06	0.17	0.00	0.01	0.01	30.86
<i>Install Underground Cable and Ductbank</i>							
Backhoe/Loader	0.00	0.00	0.00	0.00	0.00	0.00	0.52
Paving Machine	0.00	0.00	0.00	0.00	0.00	0.00	0.26
Roller	0.00	0.00	0.00	0.00	0.00	0.00	0.19
Fugitive Dust					0.02	0.00	
Concrete Truck - 9 CY	0.00	0.00	0.00	0.00	0.00	0.00	0.45
Materials Truck - Deliveries	0.00	0.00	0.00	0.00	0.00	0.00	0.31
Paving Truck - 20 CY	0.00	0.00	0.00	0.00	0.00	0.00	0.18
Subtotal	0.00	0.01	0.01	0.00	0.02	0.00	1.91
Total Emissions - K7	0.09	0.34	0.88	0.00	0.16	0.05	175.37
Total Project Emissions	0.19	0.68	1.75	0.00	0.32	0.10	347.01

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Appendix B

Regulatory Correspondence

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Appendix B-1

Endangered Species Act Regulatory Consultation

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003



IN REPLY REFER TO:
08EVEN00-2012-F-0107

May 9, 2012

Beatrice L. Kephart
30 CES/CEA
1028 Iceland Avenue
Vandenberg Air Force Base, California 93437-6010

Subject: Biological Opinion for Replacement of K-series Electrical Distribution Lines on South Vandenberg Air Force Base, Santa Barbara County, California (8-8-11-F-15)

Dear Ms. Kephart:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the U.S. Air Force's (Air Force) proposal to replace 31.7 miles of electrical distribution lines on south Vandenberg Air Force Base (VAFB), and the effects on the federally endangered El Segundo blue butterfly (*Euphilotes battoides* ssp. *allyni*), and the federally threatened vernal pool fairy shrimp (*Branchinecta lynchi*) and California red-legged frog (*Rana draytonii*), in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act)(16 U.S.C. 1531 et seq.). You determined that the project would have no effect on the federally endangered La Graciosa thistle (*Cirsium loncholepis*), Lompoc yerba santa (*Eriodictyon capitatum*), and Gaviota tarplant (*Deinandra increscens* spp. *villosa*), or any other listed species or designated critical habitat. Your request, dated October 11, 2011, was received in our office on October 14, 2011.

This biological opinion was prepared using information you provided in your letter requesting initiation of formal consultation, the biological assessment (VAFB 2011), and information in our files. A complete record of this consultation can be made available at the Ventura Fish and Wildlife Office.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Air Force proposes to replace approximately 31.7 miles of existing electrical lines that were installed in the 1950s with new utility poles and electrical lines. The poles and lines need to be replaced due to the effects of moist, salty air of the coastal area that has caused corrosion to conductors and pole hardware. The project would upgrade the power distribution circuits K-1, K-4, K-6, K-7, and K-8 on south VAFB. A reliable electrical supply is essential for carrying out

mission operations, including space and missile launches. Also, old powerlines pose a wildfire risk; two fires started by aging powerlines at VAFB burned nearly 1,900 acres in September 2009 and October 2010.

Project activities would include demolishing existing electrical lines and constructing new overhead lines. Generally, new lines would be adjacent to existing roads, but some may deviate from the existing alignment. In areas where new lines would not be near existing roads, a 15-foot wide gravel service road would be established.

Following installation of the new lines, the majority of the old lines would be removed. The existing lines would remain operational until the new lines are installed, tested, and initial operation is confirmed. Removing the existing lines may require re-establishment of old access roads. These re-established roads would be 15 feet wide and covered with gravel. Some of the access roads would be temporary and would be rehabilitated or revegetated once they were no longer needed. Equipment (tractors, backhoes, rubber-wheeled trucks) would be staged and stored on paved or unpaved parking lots or in fields covered by iceplant (*Carpobrotus* spp.) or veldt grass (*Erharta calycina*), as determined by VAFB biologists. Equipment will be operating on and off of existing roads. Where sensitive resources are located (as determined by VAFB natural resources personnel), access will be as direct as possible from existing roads or indirectly to minimize impacts on those resources. The Air Force estimates the total project area at 357 acres.

Construction of the K-1, K-7, and K-8 circuits would take 12 to 16 months and would start in summer 2012. The K-4 and K-6 circuits would also take 12 to 16 months to complete, but the Air Force does not anticipate beginning work on these circuits until 2015, contingent upon funding.

To minimize the adverse effects to listed species, the Air Force would implement the following measures:

1. A qualified biologist will conduct pre-project briefings for all workers;
2. Prior to use on VAFB, equipment will be cleaned of all foreign plant material and debris; when feasible, equipment will be cleaned between sites, especially following work in areas infested with veldt grass and pampas grass (*Cortaderia* sp.);
3. Suitable habitat for the El Segundo blue butterfly will be enhanced at a 2:1 ratio in a nearby area that is not likely to be subject to future development; enhancement will include removal of invasive iceplant;
4. A qualified biologist familiar with the California red-legged frog will monitor activities within areas “determined sensitive for this species”;

5. When practicable, project activities will not occur near potential or occupied vernal pool fairy shrimp habitat until the soil is dry to the touch;
6. Qualified biologists will designate vernal pool fairy shrimp habitat to be avoided by flagging locations and the area will be protected by placing construction fencing around pools; construction fencing will be used in areas where construction equipment and/or personnel will be situated adjacent to or in the vicinity of suitable vernal pool fairy shrimp habitat;
7. If project activities remove native vegetation within designated vernal pool fairy shrimp buffer zones, the area will be re-seeded with a seed mixture approved by a VAFB biologist and invasive plants will be removed at a 1:1 ratio (habitat enhanced: habitat affected) from a nearby buffer for temporary disturbances and at a 5:1 ratio for permanent disturbances;
8. Fill material will not be placed or transported into designated vernal pool fairy shrimp buffer zones;
9. Appropriate sedimentation barriers will be placed downslope of a project site and construction fencing or other appropriate protective fencing placed around vernal pools as deemed necessary by the on-site biologist; fencing will be used in locations where project equipment and/or personnel are situated adjacent to, or in the vicinity of, vernal pool fairy shrimp habitat; and
10. If project activities result in the alteration of the hydrological integrity of a vernal pool fairy shrimp buffer zone, the topography will be restored to allow the lateral movement of water to occupied habitats; altering the topography of occupied habitat is unlikely, however, if this occurs, the area of impact will be re-evaluated for 2 seasons with at least average rainfall to determine if the effects are permanent or temporary.

ANALYTICAL FRAMEWORK FOR THE JEOPARDY DETERMINATION

The jeopardy analysis in this Biological Opinion relies on four components: (1) the *Status of the Species*, which evaluates the range-wide condition of the El Segundo blue butterfly, vernal pool fairy shrimp, and California red-legged frog, the factors responsible for that condition, and the species' survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of these species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of these species; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on these species; and (4) the *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on these species.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the current status of each of these species, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of these species in the wild.

STATUS OF THE SPECIES

El Segundo Blue Butterfly

The El Segundo blue butterfly was federally listed as endangered on June 1, 1976 (Service 1976). Critical habitat for the subspecies has not been designated. We issued a recovery plan for the El Segundo blue butterfly on September 28, 1998 (Service 1998).

The El Segundo blue butterfly is in the family Lycaenidae. It is one of five subspecies comprising the polytypic species, square-spotted blue butterfly (*Euphilotes battoides*). Like all species in the genus *Euphilotes*, the El Segundo blue butterfly spends its entire life cycle in intimate association with a species of buckwheat, in this case coast buckwheat (*Eriogonum parvifolium*). However, the nearly complete association of all life stages with a single plant is unique among North American butterflies. El Segundo blue butterfly adults mate, nectar, lay eggs, perch, and in most cases probably die on flower heads (Mattoni 1990).

The adult stage of the El Segundo blue butterfly begins in early June and concludes in early to mid-September. The onset of this stage is closely synchronized with the beginning of the flowering season for coast buckwheat (Mattoni 1990). Typically, adult females survive up to 2 weeks whereas a male may survive up to 7 days (G. Pratt, Department of Entomology, University of California Riverside, pers. comm. 2006a). Upon emergence as adults, females fly to coast buckwheat flower heads where they mate with males that are constantly moving among flower heads (Service 1998). Eggs hatch within 3 to 5 days. The larvae then undergo four instars to complete growth, a process that takes 18 to 25 days (Service 1998). By the third instar, the larvae develop honey glands, and are thereafter usually tended by ants (e.g., *Iridomyrmex humilis*, *Conomyrmex* spp.), which may protect them from parasitoids (e.g., Branchoid wasp (*Cortesia* spp.)) and small predators (Mattoni 1990). The larvae remain concealed within flower heads and initially feed on pollen, then switch to feeding on seeds sometime during the first and second instar (Pratt, pers. comm. 2006a). Larvae are highly polymorphic, varying from almost pure white or yellow to strikingly marked individuals with a dull red-to-maroon background broken by a series of yellow or white dashes (Mattoni 1990). By September, coast buckwheat plants have generally senesced and the larvae fall or crawl to the ground and diapause in the soil. They emerge as adults the following June. Some pupae may remain in diapause for 2 or more years (Service 1998). At least 0.5 inch of rain must penetrate the soil to accumulate enough moisture for the pupae to undergo a life stage change (Pratt, pers. comm. 2006a).

Population dynamics of this species are closely allied with the coast buckwheat. Although individual buckwheat plants may live 20 years or more, young plants generally do not flower

until their second year of growth (Arnold and Goins 1987). Younger and older plants do not produce as many flowers as middle-aged buckwheat plants, which support the most butterflies (Arnold and Goins 1987). Field observations suggest that most solitary buckwheat plants less than about 5 years of age do not produce enough flowers for larvae to effectively utilize them (Arnold 1983). Therefore, survival of the El Segundo blue butterfly is dependent upon maintenance of middle-aged buckwheat plants, plus recruitment of younger plants to replace older individuals that senesce (Arnold 1983).

The range of coast buckwheat is greater than the known range of the El Segundo blue butterfly; coast buckwheat occurs from San Diego County to the northern end of Monterey County (Pratt, pers. comm. 2006b). However, the southern extent of the El Segundo blue butterfly's known distribution is Malaga Cove in Los Angeles County; before 2005 when the butterfly was discovered in Santa Barbara County, the northern extent of the subspecies' known distribution was the Ballona Wetlands, which is also in Los Angeles County. The El Segundo blue butterfly appears further limited to areas with high sand content (Service 1998).

In general, the El Segundo blue butterfly is negatively impacted by competition with non-native vegetation; competition, predation, and parasitism by other insects utilizing coast buckwheat; and habitat fragmentation. Relatively fast-growing exotics such as acacia (*Acacia* spp.), iceplant, other buckwheat species (*Eriogonum* spp.), and non-native grasses compete with coast buckwheat by inhibiting seedlings from sprouting and maturing to juveniles (Mattoni 1990). Pratt (1987) observed numerous insects living in coast buckwheat inflorescences along with El Segundo blue butterfly larvae, including lepidopterous larvae in the families of Cochylidae, Gelechiidae, Geometridae, Riodinidae, and even other Lycaenidae.

Habitat fragmentation is detrimental to small, isolated populations and produces edge effects that facilitate the introduction of invasive plant species that can out-compete and displace coast buckwheat. Urbanization and land conversion have fragmented the historic range of the El Segundo blue butterfly such that extant populations now operate as independent units rather than parts of a metapopulation or a single, cohesive, wide-ranging population. Small populations have higher probabilities of extinction than larger populations because their low abundance renders them susceptible to inbreeding, loss of genetic variation, high variability in age and sex ratios, demographic stochasticity, and other random, naturally occurring events such as droughts or disease epidemics (Soulé 1987). Isolated populations are more susceptible to elimination by stochastic events because the likelihood of recolonization following such events is negatively correlated with the extent of isolation (Wilcox and Murphy 1985).

For several decades following the subspecies' description, the El Segundo blue butterfly was presumed to be endemic to southwestern Los Angeles County in coastal southern California. Museum records reveal that the El Segundo blue butterfly was once widespread on the El Segundo sand dunes and specimens were collected at El Segundo, Redondo Beach, Manhattan Beach, and at several locations on the Palos Verdes peninsula (Donahue 1975). Until their discovery at VAFB, populations were currently known to survive at four locations in Los Angeles County: the Ballona Wetlands, the Airport Dunes, the Chevron Preserve, and Malaga

Cove. Four recovery units, based on geographic proximity, habitat similarity, and possible genetic exchange, encompass these areas with the known populations and (or) areas with restorable habitat (Service 1998).

Population in Santa Barbara County

The El Segundo blue butterfly was reported to occur at VAFB in 2005 by Dr. Gordon Pratt and by Dr. Pratt and Dr. Richard Arnold in 2007 (Pratt, pers. comm. 2006a; E. Bell, Vandenberg Air Force Base biologist, pers. comm. 2007), although it is not clear whether the individuals observed at VAFB are actually the El Segundo blue butterfly or morphologically similar species. Clarifying the taxonomic status of these populations is not trivial as *Euphilotes* is a diverse genus with known cryptic speciation (i.e., some species are very similar morphologically) (Mattoni 1988). Wing characters are notoriously unreliable due to individual variability, so single individuals usually cannot be confidently determined without other clues such as location, flight season, and larval host plant (G. Ballmer, Department of Entomology, University of California Riverside, pers. comm. 2006). Given the geographic separation between VAFB and the El Segundo Dunes (approximately 120 miles) and the relatively limited dispersal capability of El Segundo blue butterflies, it is possible that the butterflies observed at VAFB are not El Segundo blue butterflies but rather an undescribed species. Conversely, it is also possible that suitable habitat for the El Segundo blue butterfly was once contiguous from the El Segundo sand dunes to Santa Barbara County and has been displaced in some areas by development and other anthropogenic causes resulting in a disjunction in the species' distribution. Based on wing morphology, flight period, genitalia, and host plant association; these individuals were determined to be more similar to the El Segundo blue butterfly than to any other known *Euphilotes battoides* group taxon (Ballmer, pers. comm. 2006; Pratt, pers. comm. 2006c).

Butterflies in the genus *Euphilotes* can be very similar morphologically yet significantly different genetically (Mattoni 1990; Pratt 1994). To try to conclusively determine the identity of these butterflies, individual male butterflies were collected to compare the genetic signatures among the butterflies from VAFB with known El Segundo blue butterflies. We have reviewed the results of the genetic study and determined that the resulting information was not conclusive enough to make a determination that the butterfly in question is not the El Segundo blue butterfly. Therefore, we consider this species to be the El Segundo blue butterfly until we receive definitive information demonstrating otherwise.

Based on surveys conducted at VAFB in 2010, the Air Force observed 361 El Segundo blue butterflies; 217 on North Base and 145 on South Base. In 2009, 329 butterflies were observed; 154 on North Base and 175 on South Base. Arnold (1986) conducted capture-recapture studies in Los Angeles County and reported that the majority of El Segundo blue butterflies moved 100 feet or less between captures; 79 percent and 87 percent for females and males, respectively. Approximately 93 percent of females and males moved 200 feet or less, and only 3 percent of females and 4 percent of males moved more than 500 feet. The farthest distance moved by any individual butterfly was approximately 7,200 feet (1.36 miles). Based upon the most recent survey data from 2011, and taking into account that the vast majority of individual El Segundo

blue butterflies move 200 feet or less, calculating a 200-foot buffer around each known occupied location produces a figure of approximately 1,004 acres of known occupied habitat at VAFB.

Notably, the 200-foot buffer was derived from studies at the Chevron Refinery in El Segundo. This preserve is 1.5 acres and is completely surrounded by urban areas. The area contains high concentrations of coast buckwheat plants that grow in close proximity to one another. Therefore, the adult butterflies would not have to disperse very far to locate suitable buckwheat flower heads. In contrast, the preserve at the Los Angeles International Airport is 200 acres and contains widely scattered coast buckwheat plants. At this site, El Segundo blue butterflies were detected dispersing up to 1.4 miles. Additionally, adult butterflies dispersed up to 0.5 mile from occupied locations to colonize restoration sites in Los Angeles and Redondo Beach. Because the El Segundo blue butterfly has been observed to disperse farther distances in larger areas that contain more widely scattered plants, such as VAFB, the 200-foot buffer may represent the lower end of the dispersal distance capability of the El Segundo blue butterfly (Air Force 2010).

Surveys were also conducted within habitat accessible to the public outside of VAFB. These sites included Sweeney and Santa Rosa Roads in Lompoc. The butterflies observed were morphologically consistent with the El Segundo blue butterfly and were found in association with flowering coast buckwheat stands. Subsequently, both Dr. Richard Arnold and Dr. Gordon Pratt determined these butterflies to be the El Segundo blue butterfly through examination of genitalia. A total of 18 El Segundo blue butterflies and approximately 26 acres of occupied habitat were documented in these areas.

Recovery Plan for the El Segundo Blue Butterfly

The recovery plan for the El Segundo blue butterfly (Service 1998) was written prior to the discovery of the species on VAFB, so the base is not considered in the plan. The overall goals of recovery are applicable, however. According to the recovery plan (Service 1998), the El Segundo blue butterfly can be considered for downlisting to threatened status when:

1. At least one secure population in each of the four Recovery Units (RUs) -Ballona, Airport, El Segundo, and Torrance - are permanently protected. The Airport Dunes (Napoleon Street and Waterview Street to the north, Vista del Mar to the west, Pershing Drive to the east, and Imperial Highway to the south) located in the Airport RU contains the largest population of the butterfly and is the most likely one that can survive disease, predators, parasites, and other perturbations. The Airport Dunes must be one of the protected populations.
2. Each of the four populations are managed to maintain coastal dune habitat dominated by local native species including coast buckwheat.
3. As determined by a scientifically credible monitoring plan, each of the four populations must exhibit a statistically significant upward trend (based on transect counts) for at least 10 years (approximately 10 butterfly generations). Population management in each

Recovery Unit must ensure that discrete population growth rates (λ s) are maintained at or above 1.0, indicating a stable or increasing population.

4. A program is initiated to inform the public about the El Segundo blue butterfly and its habitat.

Vernal Pool Fairy Shrimp

The Service listed the vernal pool fairy shrimp as threatened on September 19, 1994 (59 Federal Register (FR) 48136). Critical habitat was designated on August 6, 2003 (68 FR 46684); however, it was remanded by Court order on October 29, 2004, and the Court ordered the Service to reconsider its decision and issue a new critical habitat rule. The final rule designating critical habitat for the vernal pool fairy shrimp was published on August 11, 2005 (70 FR 46924), and final administrative revisions were published on February 10, 2006 (71 FR 7118). The recovery plan for vernal pool ecosystems of California and southern Oregon (Service 2005) addresses the vernal pool fairy shrimp; however, the populations of vernal pool fairy shrimp in coastal San Luis Obispo and Santa Barbara Counties were not known at the time the recovery plan was made final. The recovery plan is discussed in detail at the end of this section.

The following account summarizes information contained in the five-year review of the status of the vernal pool fairy shrimp, final rules for listing and designation of critical habitat, and the recovery plan. Additional information is available in Eriksen and Belk (1999) and Helm (1998).

The vernal pool fairy shrimp is a small, translucent, freshwater crustacean in the family Branchinectidae of the order Anostraca. Adults range in size from 0.4 to 1.0 inch and are distinguished from a similar species, the Colorado fairy shrimp (*Branchinecta coloradensis*), by the male's ridge-like outgrowth on the basal segment of the antennae and the female's shorter, pyriform (pear-shaped) brood pouch. They are non-selective filter-feeders that filter suspended solids from the water column. Detritus, bacteria, algal cells, and other items between 0.3 to 100 microns may be filtered and ingested.

Freshwater crustaceans, including the vernal pool fairy shrimp, have a two-stage life cycle with the majority of their life cycle spent in the cyst (egg) stage. Vernal pool fairy shrimp females produce an unknown number of cysts per clutch and over their lifetime. The cysts are either dropped to the pool bottom or remain in the brood sac until the female dies and sinks. Fairy shrimp cysts are capable of withstanding heat, cold, and prolonged desiccation and may persist in the soil for an unknown number of years until conditions are favorable for successful hatching. The cysts hatch when the vernal pools/seasonal depressions fill with rainwater. Not all cysts are likely to hatch in a season, thus providing a mechanism for survival if the inundation period is too short in a given year. This species can mature quickly, allowing it to persist in short-lived shallow pools; however, the species also persists later into the spring when pool inundation persists. The cysts are dispersed by wind and water, as well as through the intestinal tract of birds and likely other animals (Proctor 1964, Proctor et al. 1967).

Habitat for vernal pool fairy shrimp consists of vernal pools and ephemeral wetlands that pond for a period of time sufficient to complete their life cycle. Under optimal conditions this can be as little as 18 days; however, 41 days is more typical of usual seasonal conditions. The species often occurs in habitat that exhibits an unpredictable and short-lived inundation pattern and includes vernal pools and vernal pool-like depressions, depressions in sandstone rock outcrops, earth slumps, and grassy swales and depression basins. Upland vegetation communities associated with vernal pool fairy shrimp habitat include native and non-native grassland, alkaline grassland, alkaline scrub, and coastal sage scrub. Maintaining the integrity of surrounding upland habitat is critical to the proper ecological functioning of vernal pool habitat.

Vernal pool fairy shrimp rarely co-occur with other fairy shrimp species; when they do, they are never the numerically dominant species. Vernal pool fairy shrimp have been observed with the versatile fairy shrimp (*Branchinecta lindahli*) and Santa Rosa Plateau fairy shrimp (*Lindleriella santarosae*) as well as the federally-listed conservancy fairy shrimp (*Branchinecta conservatio*) and longhorn fairy shrimp (*Branchinecta longiantenna*). Fairy shrimp are food for a wide variety of wildlife, including beetles, insect larvae, frogs, salamanders, toad tadpoles, shorebirds, ducks, and even other fairy shrimp.

Although vernal pool fairy shrimp are more widely distributed than most other fairy shrimp species, the species is generally uncommon throughout its range and rarely abundant where it is found. The species currently occurs predominantly in a variety of vernal pool and ephemeral ponded habitats in the Central Valley and Coast Range of California, with a limited number of sites in the Transverse Range and on the Santa Rosa Plateau and in Hemet, Riverside County. There is also one disjunct occurrence in Jackson County, southern Oregon. California counties where extant records occur include Alameda, Butte, Contra Costa, El Dorado, Fresno, Glenn, Kings, Los Angeles, Madera, Merced, Monterey, Napa, Placer, Riverside, Sacramento, San Benito, San Joaquin, San Luis Obispo, Santa Barbara, Shasta, Solano, Stanislaus, Tehama, Tulare, Ventura, and Yuba. Elevations at which the species is typically found range from 33 feet to 4,000 feet, although it has been found at 5,600 feet in the Los Padres National Forest.

The primary threats to the vernal pool fairy shrimp continue to be the modification, destruction, and degradation of suitable habitat, and the resulting habitat fragmentation. Additionally, altered site hydrology, inappropriate grazing levels (cessation of grazing or overgrazing), non-native invasive plants, and related issues such as thatch build-up, contaminant runoff into vernal pools, and drought and climate change are also major threats. While predation by non-native species has not been quantified, it could pose a substantial threat to specific occurrences. However, the magnitude of this threat remains unclear. Even on protected lands, new and emerging threats have been identified in the form of hydrologic alteration resulting from invasive non-native plants. Other new threats include the cessation of grazing in areas of vernal pool habitat, threats from non-native mosquitofish, and threats due to climate change and drought.

At the time of listing, 178 extant occurrences of vernal pool fairy shrimp were known from 32 putative populations, based on proximity of known occurrences. Currently, 608 occurrences have been recorded (CNDDDB 2012), although the number of extant occurrences is unknown. An

unknown portion of these records were established based on surveys at sites for proposed projects, so may no longer be extant, although compensation measures have minimized effects to the species by creating and preserving occupied vernal pool habitat. Although a new, disjunct cluster of occurrences has been located in Oregon, and new locality records have been established within the shrimp's range (primarily in population centers where the shrimp was previously known), the distribution of the shrimp remains essentially unchanged.

Within ephemerally ponded and vernal pool habitat on the Central Coast of California (e.g., Monterey, San Luis Obispo, and Santa Barbara Counties), vernal pool fairy shrimp are known to occupy at least 55 basins on Fort Hunter Liggett, at least 46 basins at Camp Roberts, Soda Lake at the Carrizo Plain National Monument, several areas in the vicinity of the city of Paso Robles, at least two sites in the Los Padres National Forest, at least 60 natural or man-made features at the Unocal-Chevron tank farm and an isolated nearby area, at least two vernal pools at the Santa Maria Airport, and in at least 12 complexes on VAFB. A number of these sites were discovered after the publication of the listing and critical habitat rules and recovery plan.

Based solely on locality information, the species appears to be more abundant than previously thought; however, records suggest that the shrimp is frequently present only in low numbers or only present in a small percentage of the pools at a site. Rather than the number of occurrences, the number of complexes, the size of populations in each complex, and their connectedness are the key to persistence of the species. In most cases, the Service has no information to indicate that recorded "occurrences" represent demographically independent units that contribute to the species' viability. We do not yet have better data with which to define populations of this species, so the extent to which individual occurrences contribute to populations of the shrimp is largely unknown.

Vernal pool fairy shrimp occurrences continue to be threatened by conversion of natural habitat for urban and agricultural uses. Fragmentation of habitat due to these causes results in isolated occurrences of this species in some core areas. Highly fragmented populations are more susceptible to extirpation due to environmental disturbance than populations linked across the landscape. If an extirpation event occurs in a population that has been fragmented, the opportunities for natural re-colonization are greatly reduced due to physical isolation from source populations. The Service is working with the state and private landowners to protect remaining suitable habitat in large, contiguous blocks; however, purchase of conservation easements is in progress and has not yet been completed. Both protected and unprotected populations in the Central Valley appear to be increasingly subject to decreased suitability of habitat due to changes in pool inundation associated with intrusion by non-native plant species, and removal of grazing from grasslands near cities. Remnant habitat is also subject to development-related changes to watersheds. With predicted changes in climate over the next century, variable climatic conditions are expected to place additional strains on vernal pool ecosystems. The vernal pool fairy shrimp may survive prolonged drought due to life history adaptations; however, increases in warm winter storm events may preclude hatching of the species at lower latitudes and/or elevations.

Recovery Plan for the Vernal Pool Fairy Shrimp

General recovery criteria for the vernal pool fairy shrimp and 19 other listed plants and animals are described in the Recovery Plan (Service 2005a). The Recovery Plan utilizes an ecosystem level approach because many of the listed species and species of concern co-occur or overlap in distribution within natural vernal pool habitats, and are, therefore, generally threatened by the same human activities. The five key elements that comprise this ecosystem-level recovery and conservation strategy are: (1) habitat protection; (2) adaptive management, restoration, and monitoring; (3) status surveys; (4) research; and (5) public participation and outreach. According to the 5-year review for the vernal pool fairy shrimp (Service 2007), none of these recovery criteria have been met.

California Red-legged Frog

The California red-legged frog was federally listed as threatened on May 23, 1996 (Service 1996) and critical habitat was designated for the subspecies on April 13, 2006 (71 FR 19244). The Service completed a recovery plan for the subspecies in 2002 (Service 2002). Critical habitat for the California red-legged frog was finalized on March 17, 2010 (75 FR 12816) after multiple revisions. No critical habitat has been designated for the California red-legged frog on VAFB.

The historical range of the California red-legged frog extended coastally from southern Mendocino County and inland from the vicinity of Redding, California, southward to northwestern Baja California, Mexico (Jennings and Hayes 1985, Storer 1925). The California red-legged frog has been extirpated or nearly extirpated from 70 percent of its former range. Historically, this subspecies was found throughout the Central Valley and Sierra Nevada foothills. Four additional occurrences have been recorded in the Sierra Nevada foothills since listing, bringing the total to five extant populations, compared to approximately 26 historical records (71 FR 19244). Currently, California red-legged frogs are known from three disjunct regions in 26 California counties and one region in Baja California, Mexico (Grismer 2002; Fidenci 2004; and R. Smith and D. Krofta, in litt. 2005).

The California red-legged frog uses a variety of habitat types, including various aquatic systems, riparian, and upland habitats. The diet of California red-legged frogs is highly variable. Hayes and Tennant (1985) found invertebrates to be the most common food item of adults. Vertebrates, such as Pacific chorus frogs (*Pseudacris regilla*) and California mice (*Peromyscus californicus*), represented over half of the prey mass eaten by larger frogs (Hayes and Tennant 1985). Hayes and Tennant (1985) found juveniles to be active diurnally and nocturnally, whereas adults were largely nocturnal.

California red-legged frogs breed from November through March; earlier breeding has been recorded in southern localities (Storer 1925). Males appear at breeding sites from 2 to 4 weeks before females (Storer 1925). Female California red-legged frogs deposit egg masses on emergent vegetation so that the masses float on the surface of the water (Hayes and Miyamoto

1984). Egg masses contain about 2,000 to 5,000 moderately-sized, dark reddish brown eggs (Storer 1925, Jennings and Hayes 1985). Eggs hatch in 6 to 14 days (Storer 1925). Larvae undergo metamorphosis for 3.5 to 7 months after hatching (Storer 1925, Wright and Wright 1949). Sexual maturity can be attained at 2 years of age by males and 3 years of age by females (Jennings and Hayes 1985); adults may live 8 to 10 years (Jennings et al. 1992) although the average life span is considered to be much lower. The California red-legged frog is a relatively large aquatic frog ranging from 1.5 to 5 inches from the tip of the snout to the vent (Stebbins 1985).

California red-legged frogs breed in aquatic habitats. Larvae, juveniles, and adults have been collected from streams, creeks, ponds, marshes, plunge pools and backwaters of streams, dune ponds, lagoons, and estuaries. California red-legged frogs frequently breed in artificial impoundments such as stock ponds, if conditions are appropriate. Although California red-legged frogs successfully breed in streams and riparian systems, high seasonal flows and cold temperatures in streams often make these sites risky environments for eggs and tadpoles. The importance of riparian vegetation for this species is not well understood. When riparian vegetation is present, California red-legged frogs spend considerable time resting and feeding in it; the moisture and camouflage provided by the riparian plant community provide good foraging habitat and may facilitate dispersal in addition to providing pools and backwater aquatic areas for breeding.

Juvenile and adult California red-legged frogs may disperse long distances from breeding sites throughout the year. They can be encountered living within streams at distances exceeding 1.8 miles from the nearest breeding site, and have been found up to 400 feet from water in adjacent dense riparian vegetation (Bulger et al. 2003). During periods of wet weather, starting with the first rains of fall, some individuals may make overland excursions through upland habitats. Most of these overland movements occur at night. Bulger et al. (2003) found marked California red-legged frogs in Santa Cruz County making overland movements of up to 2 miles over the course of a wet season. These individual frogs were observed to make long-distance movements that are straight-line, point to point migrations over variable upland terrain rather than using riparian corridors for movement between habitats. For the California red-legged frog, suitable habitat is considered to include all aquatic and riparian areas within the range of the species and includes any landscape features that provide cover and moisture (Service 1996).

Habitat loss and degradation, combined with over-exploitation and introduction of exotic predators, were important factors in the decline of the California red-legged frog in the early to mid-1900s. Continuing threats to the California red-legged frog include direct habitat loss due to stream alteration and loss of aquatic habitat, indirect effects of expanding urbanization, competition or predation from non-native species including the bullfrog, catfish (*Ictalurus* spp.), bass (*Micropterus* spp.), mosquitofish, red swamp crayfish (*Procambarus clarki*), and signal crayfish (*Pacifasticus leniusculus*).

An additional threat affecting amphibians worldwide is the chytrid fungus *Batrachochytrium dendrobatidis*. *Batrachochytrium dendrobatidis* causes chytridiomycosis, a skin disease that has

been found to disrupt osmoregulatory function in the skin of amphibians, resulting in an imbalance of electrolytes and death (Voyles et al. 2009). Chytridiomycosis in amphibians may be marked by deformed mouthparts in tadpoles, wherein most infected tadpoles will die at metamorphosis (Service 2002a). Infected boreal toads (*Anaxyrus boreas boreas*) showed few clinical signs of the disease but many appeared weak or lethargic, exhibited excessive shedding of skin and were reluctant to flee at the approach of humans (U.S. Geological Service 2000, as cited in Service 2002a). Chytrid fungi are widespread in the environment where they act as decomposers of keratin, chitin, cellulose, and other plant material, and are known parasites of fungi, algae, higher plants, protozoa, invertebrates, and most recently in vertebrates. Chytrid fungi reproduce asexually by means of minute, fragile, motile spores, and are probably spread directly from amphibian to amphibian in water. These fungi most likely move from one water source to another on migrating amphibians, waterbirds, or flying insects (Service 2002).

Since its discovery in 1998, chytrid fungus has likely been responsible for die-offs of a number of amphibian species, including remaining populations of the endangered boreal toad (*Bufo boreas boreas*) in the southern Rocky Mountains, and Chiricahua leopard frogs (*Rana chiricahuensis*) in Arizona (Colorado Herpetological Society 2000, as cited in Service 2002a). Occurrences of infection have been observed in two amphibian species in the Sierra Nevada, the mountain yellow-legged frog (*Rana muscosa*) and the Yosemite toad (*Bufo canoris*). An infected California red-legged frog tadpole was collected in Calabasas Pond on the Ellicott Slough National Wildlife Refuge in Santa Cruz County (Service 2002a).

The chytrid fungus is now recognized for its ability to spread quickly through amphibian populations and infect numerous species, causing high rates of mortality, and persisting at low host densities (Voyles et al. 2009). These recent findings validate the importance of taking precautions to prevent the spread of chytrid fungus or any disease agent into and/or between amphibian populations. It is considered a threat to California red-legged frog populations.

Recovery Plan for the California Red-legged Frog

According to the recovery plan for the California red-legged frog, the strategy for the species' recovery involves: (1) protecting existing populations by reducing threats; (2) restoring and creating habitat that will be protected and managed in perpetuity; (3) surveying and monitoring populations and conducting research on the biology and threats to the species; and (4) reestablishing populations of the species within its historical range (Service 2002).

The recovery plan for the California red-legged frog identifies eight recovery units. These recovery units are based on the Recovery Team's determination that various regional areas of the species' range are essential to its survival and recovery. The recovery status of the animal is considered within the scale of Recovery Units as opposed to the overall range. Because of the varied status of this species and differing levels of threats throughout its range, recovery strategies differ per recovery unit to best meet the goal of delisting the species. For example, in areas where California red-legged frog populations appear to be stable, recovery strategies are intended to protect existing population numbers, whereas in areas where frogs have been

extirpated or are declining, strategies are to stabilize, increase, augment, or reestablish populations.

The recovery units are delineated by major watershed boundaries as defined by U.S. Geological Survey hydrologic units and the limits of the range of the California red-legged frog. The goal of the recovery plan is to protect the long-term viability of all extant populations within each recovery unit. Within each recovery unit, core areas have been delineated and represent contiguous areas of moderate to high California red-legged frog densities that are relatively free of exotic species such as bullfrogs. The goal of designating core areas is to protect metapopulations that, combined with suitable dispersal habitat, will allow for the long term viability within existing populations. This management strategy allows for the recolonization of habitat within and adjacent to core areas that are naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of the California red-legged frog.

ENVIRONMENTAL BASELINE

The implementing regulations for section 7(a)(2) of the Act define the “action area” as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For the purposes of this biological opinion and based on the information provided by the Air Force, we consider the action area to include the entire 31.7 miles of powerlines to be replaced and the appurtenant 357 acres that would be disturbed for conducting the work, access roads and staging areas. The acreages that were provided by the Air Force for the area of impact for each circuit were calculated based on the design of the replacement lines and not on a standard corridor width.

Much of the project area is in ruderal/roadside habitat and previously disturbed areas dominated by non-native plant species (VAFB 2011). Ten distinct habitat types were identified within the project area: agricultural, ruderal, non-native grassland, central coast scrub, riparian woodland, maritime chaparral, Bishop pine forest, coast live oak woodland, tan oak woodland, and freshwater marsh. Central coast scrub is the dominant vegetation type in the project area.

El Segundo Blue Butterfly

According to the biological assessment submitted by the Air Force (VAFB 2011), El Segundo blue butterflies have been documented at 4 locations on VAFB: Tranquillon Peak; along Spur Road (near San Antonio Creek and the railroad overpass); near South Spur Road (west of the Taurus Launch Facility; and near the intersection of Coast Road and Bear Creek Road. The species is generally found on VAFB in coastal dune and central coast scrub habitats.

Large portions of the project area were surveyed for the presence of coast buckwheat and El Segundo blue butterflies between 2007 and 2010 (VAFB 2011). A portion of the K-1 electrical circuit is within occupied habitat. Also, a single El Segundo blue butterfly was observed approximately 0.5 mile west of the K-4 and 2 miles south of the K-7 lines. Despite the lack of observations in other areas, the presence of coast buckwheat in those areas means the El Segundo

blue butterfly could be present but was not detected. Therefore, the Air Force has assumed that the El Segundo blue butterfly is present throughout the action area (VAFB 2011).

Status of Recovery Efforts for El Segundo Blue Butterfly in the Action Area

While the recovery plan for the El Segundo blue butterfly did not contemplate the role of VAFB in the species' recovery, the Air Force has taken numerous steps to conserve the species on the base. The species is considered in the Integrated Natural Resources Management Plan (INRMP) for the base, which was endorsed by the Service in 2011, and measures to conserve the El Segundo blue butterfly and its host plant are included. The positive conservation measures for the El Segundo blue butterfly the Air Force has implemented at VAFB so far include: (1) surveys to further delineate the species' occurrence on the base; (2) removal of invasive plants from hundreds of acres of potentially suitable habitat; (3) cooperated with research through U.C. Riverside and U.C. Santa Barbara; (4) public outreach; and (5) funding pioneering research into commensal relationships between the El Segundo blue butterfly and harvester ants (*Messor* spp., *Pogonomyrmex* spp.). Therefore, although the recovery plan for the El Segundo blue butterfly did not consider the potential presence of the species at VAFB, the Air Force has made a positive effort to conserve the species on the base, which would be consistent with other recovery efforts.

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp was documented on VAFB in 2004. Protocol surveys were conducted between November 2004 and April 2006 in 222 wetlands considered suitable habitat for the vernal pool fairy shrimp and similar species. Throughout the base, 82 acres of habitat occupied by the vernal pool fairy shrimp have been identified. An additional 15 acres of potentially suitable habitat on VAFB were identified after surveys had been completed, but have not been searched for vernal pool fairy shrimp; these are assumed by the Air Force to be occupied until negative surveys prove otherwise.

Within the action area, approximately 5,000 linear feet of the K-1 line is near known occupied vernal pool fairy shrimp habitat with hydrological connection to areas adjacent to Arguello Road. The K-7 line replacement will be near one vernal pool that is known to be occupied by vernal pool fairy shrimp and 3 other vernal pools that have not been sampled and may support the species.

Status of Recovery Efforts for Vernal Pool Fairy Shrimp in the Action Area

No specific goals or milestones are defined in the recovery plan for the vernal pool fairy shrimp on VAFB, nor are any recovery units identified on VAFB. Lacking specific goals for the species on the base, we consider the overall recovery strategy and place the Air Force's conservation efforts in that context.

The INRMP for VAFB includes measures to conserve and protect vernal pool fairy shrimp and their habitat, described in general as follows: "Each known occupied pool is visited at least once

per year in the wet season to monitor status and photograph the site. VAFB maintains restrictions on driving in occupied pools during the wet season, except for emergency actions such as response to power outages.”

Further, the INRMP identifies conservation measures and protective actions VAFB would implement in freshwater wetlands, which includes vernal pool habitat. Although general in nature, if implemented, the measures included in the VAFB INRMP should provide some protection of vernal pool fairy shrimp on the base. The larger goals from the recovery plan (i.e., habitat protection, adaptive management, habitat restoration, monitoring, status surveys, research, and public participation and outreach) are included in the INRMP. In its efforts to conserve the vernal pool fairy shrimp at VAFB in the absence of specific recovery goals, the Air Force has protected known occupied habitat on the base (e.g., habitat at 13th Street), conducted restoration projects, continued surveys of known vernal pools that may support vernal pool fairy shrimp, and conducting outreach to increase awareness of the species on VAFB.

Despite the lack of specific recovery actions identified for VAFB in the recovery plan, the Air Force has implemented numerous conservation measures that are consistent with the goals of the recovery plan.

California Red-legged Frog

VAFB is located in the relative middle of the current range of the California red-legged frog. Many of the healthiest populations of the species (in terms of numbers of individuals) are located along the central coast of California, and California red-legged frogs are likely to be present in nearly all permanent streams and ponds on the base.

No focused surveys for California red-legged frogs were conducted within the action area; however, the Air Force assumes that the species may occur in places within the action area where suitable habitat is present. California red-legged frogs are known to occur in Cañada Honda, the wastewater holding area near SLC-6, and the channelized stream and pools adjacent to Ocean Avenue near the action area.

Status of Recovery Actions for California Red-legged Frog in the Action Area

The action area and VAFB in general, are within the Northern Transverse Ranges and Tehachapi Mountains Recovery Unit for the California red-legged frog. The action area is also within the Santa Maria River-Santa Ynez River Core Area defined in the recovery plan (Service 2002). The recovery unit was described in the recovery plan as having a “high recovery status,” meaning that the unit supports many populations of the species, has many areas of high habitat quality, and threat levels that range from low to high. Some protections are afforded the California red-legged frog on VAFB due to implementation of the Air Force’s INRMP. So far, the Air Force has implemented several actions that provide a positive conservation benefit: (1) public outreach and education; (2) working with researchers from U.C. Santa Barbara, the U.S. Geological Survey, and Department of the Navy, including chytridiomycosis studies; (3) surveys for new

populations; (4) monitoring of known populations; and others. These efforts are consistent with the goals from the recovery plan of protecting known populations; protecting suitable habitat, corridors, and core areas; developing and implementing management plans for preserved habitat, occupied watersheds, and core areas; developing land use guidelines; gathering biological and ecological data necessary for conservation of the species; and monitoring existing populations and conducting surveys for new populations. We conclude that the status of the California red-legged frog's recovery on VAFB is improved from 2002 when the recovery plan was finalized.

EFFECTS OF THE ACTION

The project activities could temporarily or permanently affect the El Segundo blue butterfly, vernal pool fairy shrimp, and the California red-legged frog or their habitats. The work corridor is approximately 31.7 miles long, and the Air Force estimates total disturbance would add up to 357 acres. A straight calculation would indicate that a linear project 31.7 miles long and affecting 357 acres would average approximately 93 feet wide; however, the width of the impact area would vary considerably (some narrower corridors and areas where larger disturbances would be necessary). The Air Force estimates that approximately 32 percent of the action area consists of non-native invasive vegetation, primarily iceplant, where the listed species would not be affected. The remaining 68 percent of the action area is considered native vegetation. The Air Force did not provide a breakdown of the relative habitat types that would be affected by acre or percentage, except that 5,000 linear feet of the new K-1 electrical line would be installed near known occupied vernal pool fairy shrimp habitat, and that three or more other vernal pools could be affected. Consequently, we assume that for the El Segundo blue butterfly and California red-legged frog, suitable habitat may occur anywhere along the 31.7-mile, 357-acre action area.

El Segundo Blue Butterfly

The El Segundo blue butterfly could be directly affected by site preparation and access due to removal of its host plant. We do not have an estimate of how many host plants could be removed, but we assume that when host plants are lost, individual butterfly larvae could be killed or injured as the plant is damaged or removed. Also, because project activities could occur during the flight season, damaging coast buckwheat plants could directly affect adults. We would expect the adult butterflies to be able to move out of harm's way to suitable habitat available nearby. In places where lost buckwheat plants would be replaced by the Air Force, a temporal impact could result due to the loss of mature flowering plants.

Indirectly, disturbance of the soil where coast buckwheat grows could promote growth of non-native plants as the buckwheat plants are removed. Relatively fast-growing non-native plants outcompete coast buckwheat seedlings and prevent the native plants from sprouting and maturing to reproductive form.

The direct and indirect effects of the proposed action would be avoided or minimized to some extent by the measures proposed by the Air Force. Specifically, the Air Force proposes to

establish access routes as directly as possible from existing roads or indirectly to minimize impacts on those resources. Also, a qualified biologist would conduct pre-project briefings for all workers. To minimize the spread of non-native plants, equipment would be cleaned of all foreign plant material and debris prior to use in the action area. When feasible, equipment would be cleaned between sites, especially following work in areas infested with veldt grass and pampas grass (*Cortaderia* sp.). Lastly, suitable habitat for El Segundo blue butterfly would be enhanced at a 2:1 ratio in a nearby area that is not likely to be subject to future development. Enhancement would include outplanting of seed or plants of coast buckwheat and removal of invasive iceplant.

While we expect some adverse effects to the El Segundo blue butterfly as a result of the proposed project, the majority of the effects should be temporary and minimized by the Air Force's proposed measures. Rangewide, the level of effects to the El Segundo blue butterfly we anticipate will occur within the action should not translate into a substantial diminishment of the numbers, reproduction, or distribution of the species.

Further, because we anticipate that the effects to individual El Segundo blue butterflies would be minor, and impacts to their habitat would be temporary and minimized the extent possible, the population of the species on VAFB should be able to continue to contribute to its overall conservation. We do not expect the proposed actions to diminish the ability of the action area to contribute to the recovery of the El Segundo blue butterfly.

Vernal Pool Fairy Shrimp

As noted in the opening paragraph to this section, the Air Force has specified that the proposed action could affect approximately 5,000 linear feet of habitat near vernal pools occupied by the vernal pool fairy shrimp, as well as 3 or more vernal pools where the status of the species is not known. The effects on vernal pool fairy shrimp due to intrusion into vernal pool habitat could include: compaction of soil; increased erosion and sedimentation due to loss of vegetation; crushing of cysts; burying of cysts where they cannot become rehydrated; and disturbance of the hydrology that affects necessary water inflow.

Based upon its avoidance and minimization measures, the Air Force concluded in its biological assessment (VAFB 2012) that potential and known occupied vernal pool habitat would be protected from disturbance during the project. The reasoning is that the majority of new electrical lines would be installed adjacent to existing road shoulders that are routinely disturbed; the disturbance due to the new powerlines would not exacerbate the effects to the vernal pools, and the pools have persisted in the face of these ongoing disturbances.

In addition, the Air Force proposes to, when practicable, avoid project activities near potential or occupied vernal pool fairy shrimp habitat until the soil is dry to the touch. Also, they propose: to have qualified biologists designate vernal pool fairy shrimp habitat to be avoided by flagging locations and the area will be protected by placing construction fencing around pools; when project activities remove native vegetation within designated vernal pool fairy shrimp buffer

zones, the area would be re-seeded with a seed mixture approved by a VAFB biologist and invasive plants will be removed at a 1:1 ratio (habitat enhanced:habitat affected) from a nearby buffer for temporary disturbances at a 5:1 ratio for permanent disturbances; fill material would not be placed or transported into designated vernal pool fairy shrimp buffer zones; and appropriate sedimentation barriers would be placed downslope of a project site and construction fencing or other appropriate protective fencing placed around vernal pools as deemed necessary by the on-site biologist. Lastly, if project activities result in the alteration of the hydrological integrity of a vernal pool fairy shrimp buffer zone, the topography would be restored to allow the lateral movement of water to occupied habitats.

We conclude that these measures would greatly reduce and avoid adverse effects to vernal pool fairy shrimp and their habitat that we have identified as potentially resulting from the proposed action. Because we expect the effects in the action area to be relatively minor, and given the extent of the rangewide distribution of the vernal pool fairy shrimp, we conclude that the proposed action is not likely to substantially reduce the numbers, reproduction, and distribution of the species. We further conclude that these minor effects would not interfere with the rangewide conservation of the vernal pool fairy shrimp, and that the population of vernal pool fairy shrimp should be able to contribute to the species' recovery in the face of the proposed powerline replacement.

California Red-legged Frog

The proposed powerline replacement and removal actions would not occur within standing or flowing water and all power lines are proposed to span riparian corridors where California red-legged frogs are likely to occur. Thus, we assume that this project would avoid suitable wetland habitat for the species where the majority of adverse effects would normally manifest.

California red-legged frogs have been found up to 400 feet from water in riparian vegetation, and may disperse through uplands. Therefore, despite the Air Force's intention to avoid impacts to suitable wetland habitat for California red-legged frogs, project activities outside of riparian corridors have the potential to adversely affect California red-legged frogs. To minimize impacts to this species, the Air Force would have a qualified biologist familiar with the California red-legged frog will monitor activities within areas "determined sensitive for this species." If a California red-legged frog is encountered, activities would cease until the individual moved out of harm's way of its own accord.

Given the Air Force's efforts to avoid direct and indirect effects to California red-legged frog wetland habitat, and the additional measure to avoid affecting individual frogs in upland areas, we conclude that few California red-legged frogs would be affected by project activities. Also, the habitat protection measures where the powerline replacements would cross riparian corridors will minimize or avoid habitat loss that could affect the California red-legged frog. Overall, the low number of individual California red-legged frogs we think would be affected means that the proposed action is not likely to substantially reduce the numbers, reproduction, or distribution of

the California red-legged frog. Any effects are likely to be temporary and masked by future reproduction by the species and recovery of disturbed habitat.

Because the action area is within a recovery unit with “high recovery status,” the proposed powerline replacement is not likely to reduce the potential contribution of the action area to the conservation of the California red-legged frog. In other words, the populations of California red-legged frog in the recovery unit are considered plentiful and many of those are of high quality. Overall, the effects to the species and its habitat would be relatively minor and temporary, so we anticipate that the proposed project will not diminish the species’ ability to recover.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Because the entire base is a Federal installation, we are not aware of any non-Federal actions that are reasonably certain to occur in the action area.

CONCLUSION

After reviewing the current status of the El Segundo blue butterfly, vernal pool fairy shrimp, and California red-legged frog, the environmental baseline, the effects of the action, and the cumulative effects, it is the Service’s biological opinion that the proposed activities will not jeopardize the continued existence of these species. We have reached these conclusions for the following reasons:

El Segundo Blue Butterfly

The available information indicates that the El Segundo blue butterfly has an extremely limited distribution, being found only in a small area in Los Angeles County and along the coast of Santa Barbara County north of Point Conception (mostly on VAFB). As a result, substantial effects to either population could have severe impacts on the species’ survival and recovery. On the other hand, projects that have relatively minor and temporary effects are not likely to interfere with the species’ conservation because losses in one year may be compensated for during the next mating season. Also, in the case of this action, the Air Force has proposed restoration of affected El Segundo blue butterfly habitat and enhancement of areas to create more habitat for the species. Because we have concluded that the effects of the project will be minor within the action area, we further conclude that the effects on the species rangewide will be similarly minor and will not reduce appreciably the likelihood of both the survival and recovery of the species in the wild.

Vernal Pool Fairy Shrimp

In its biological assessment (VAFB 2011), the Air Force states that any vernal pool fairy shrimp habitat in the action area would be protected from disturbance; however, some minor effects may not be avoidable (e.g., foot traffic that crushes cysts). Because most of the powerline replacements will occur in areas already disturbed (e.g., existing roadways), the Air Force further concludes that the vernal pool fairy shrimp has persisted in these areas despite ongoing effects that will differ little from the proposed action. We agree that the effects to the vernal pool fairy shrimp will be relatively minor, mainly due to the proposed avoidance and minimization measures offered in the project description, and primarily those measures to repair any damage and maintain existing hydrological impacts. Because vernal pool fairy shrimp reproduce in high numbers under good conditions, the loss of a small number of individuals in one season is of little consequence because those losses are masked by the species' reproductive strategy (i.e., producing numerous offspring to compensate for quickly changing conditions). We conclude that the effects of the project will be minor within the action area, and that the effects on the species rangewide will be similarly minor and will not reduce appreciably the likelihood of both the survival and recovery of the species in the wild.

California Red-legged Frog

The proposed action is designed to avoid most impacts to California red-legged frog wetland habitat by spanning riparian corridors and not intruding into those habitats. Some effects to California red-legged frogs in upland areas may occur, but the Air Force has proposed to have a qualified biologist monitor and direct the activities to avoid any frogs encountered in upland habitat. We agree that effects to the California red-legged frog will be minor. We do not expect any permanent loss of breeding habitat, and any individual frogs affected will be few and far between. Like the El Segundo blue butterfly and vernal pool fairy shrimp, the California red-legged frog's reproductive strategy is to produce many more offspring than just replacements for breeding adults. This strategy has evolved to compensate for high juvenile mortality due to predation and changing environmental conditions. For the rangewide status of the species, this means that minor impacts, like those we anticipate for the VAFB powerline replacement project, will be masked within the next breeding season. Because of this and because habitat loss is not expected, we conclude that the proposed action will not reduce appreciably the likelihood of both the survival and recovery of the species in the wild.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to

listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this incidental take statement.

The measures described below are non-discretionary and must be undertaken by the Air Force for the exemption in section 7(o)(2) to apply. The Air Force has a continuing duty to regulate the activity covered by this incidental take statement. If the Air Force fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Air Force must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.14(i)(3)].

El Segundo Blue Butterfly

We anticipate that the some El Segundo blue butterflies could be subject to take in the form of harm, injury, and mortality. Project actions that damage, destroy, or remove coast buckwheat plants could result in injury or mortality of individual butterflies because this species spends the vast majority of its life in close association with its host plant. Removing the host plant, or otherwise damaging it to a point that the plant would not provide the adequate life-supporting attributes for El Segundo blue butterflies could harm individual butterflies to the point of injury by significantly impairing essential behavioral patterns, including breeding, feeding, and sheltering. In addition, actions that involve soil excavation within occupied habitat could result in mortality or injury of diapausing pupae. However, because of their cryptic nature, fluctuations in abundance from one generation to the next and from one flower head to another, and the potential of injury and mortality from other sources, detecting dead or injured El Segundo blue butterflies as a result of the proposed actions would be very difficult.

We cannot reasonably estimate the number of El Segundo blue butterflies that may be taken (i.e., we do not know the number of individuals in surrounding areas or how often they may be killed or injured). Therefore, we have used the reasonable and prudent measures and terms and conditions of this incidental take statement to establish a threshold that, if met, would require the Air Force to re-initiate consultation. The reinitiation threshold is in two parts, based upon the loss of individuals and the loss of host plants.

Vernal Pool Fairy Shrimp

We anticipate that some vernal pool fairy shrimp will be taken as a result of being crushed (e.g., by foot traffic). We do not anticipate any take as a result of habitat loss (i.e., changes in hydrology, sedimentation, direct intrusion) if the Air Force implements the avoidance and minimization measures proposed. Estimating the number of cysts that could be taken as a result of crushing is impossible because the species is not likely to be uniformly distributed in a vernal

pool, nor do we have reliable density measurements for the areas that could be affected. Therefore, like the El Segundo blue butterfly, we have used the reasonable and prudent measures and terms and conditions of this incidental take statement to establish a threshold that, if met, would require the Air Force to re-initiate consultation. The difference is that the Air Force would not be able to count the cysts that are crushed, so we have established a surrogate for counting the number of individual cysts. The surrogate is also described in the reasonable and prudent measures.

California Red-legged Frog

We anticipate that California red-legged frogs could be subject to take in the form of injury and mortality. Although the new electrical lines would span riparian habitats, California red-legged frogs have been found away from water in adjacent dense riparian vegetation, therefore, depending upon where the electrical lines and poles are installed near riparian vegetation, California red-legged frogs could be subject to take from the proposed activities. We assume the frogs would be capable of moving out of harm's way to some extent, but some may not be detected and may not be avoided.

Similar to the other species, we cannot reasonably estimate the number of California red-legged frogs that may be taken because we do not know the number of individuals in surrounding areas or how often they may be killed or injured. Therefore, we have used the reasonable and prudent measures and terms and conditions of this incidental take statement to establish a threshold that, if met, would require the Air Force to re-initiate consultation.

REASONABLE AND PRUDENT MEASURES

We believe the following reasonable and prudent measures are necessary and appropriate to minimize take of the El Segundo blue butterfly, vernal pool fairy shrimp, and California red-legged frog during the project activities conducted pursuant to this biological opinion:

1. The Air Force must ensure that the level of incidental take that occurs during project implementation is commensurate with the analysis contained herein.
2. The Air Force must implement measures to minimize the loss of host plants for the El Segundo blue butterfly, and to reduce the potential for injury or mortality of California red-legged frogs in upland areas.

TERMS AND CONDITIONS

To be exempt from the prohibitions in section 9 of the Act, the Air Force must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. The following terms and conditions implement reasonable and prudent measure 1:

- a. Generally, El Segundo blue butterflies are not common anywhere they are observed, and any found dead or injured may indicate that more individuals have been similarly affected but not detected. If one (1) adult or larva of the El Segundo blue butterfly is found killed or injured due to project activities, the Air Force must notify the Ventura Fish and Wildlife Office immediately. If a second adult or larval El Segundo blue butterfly is found killed or injured by project activities, the Air Force must reinitiate formal consultation with the Service. In instances where the amount or extent of incidental take is exceeded, any operations causing such take should cease pending reinitiation.
- b. Because we also anticipate take of the El Segundo blue butterfly as a result of the loss of host plants (coast buckwheat), we also hereby establish a take threshold based upon the number of plants removed. Although the average coast buckwheat plant may have 300 flower heads and each flowerhead can support one adult butterfly, the density of adult El Segundo blue butterflies is likely to be much lower. Based upon research by Pratt (pers. comm. 2007), we anticipate that each host plant could support one adult El Segundo blue butterfly, although not all of them are likely to support one butterfly at the moment they are removed (most butterflies will move off if disturbed). Therefore, if 300 coast buckwheat plants are removed during the project activities, the Air Force must reinitiate formal consultation with the Service. Once this limit is reached, any actions causing the loss of additional host plants should cease pending reinitiation.

Note: The estimate of 300 plants removed was based upon a previous similar project with a much smaller footprint. It is likely that the actual number of coastal buckwheat plants that would be removed will be higher. Therefore, prior to initiating the project, VAFB will have a Service-approved biologist survey the route and estimate the number of coastal buckwheat plants that are likely to be removed. If our estimate of 300 plants proves to be incorrect, the Air Force will contact us to revise the number accordingly. This revision should not require reinitiation because we have anticipated a low number based upon proposed avoidance and minimization measures and a smaller project footprint; however, if VAFB determines through pre-project surveys that substantially more than 300 coastal buckwheat plants may be removed, we will re-evaluate our effects analysis to determine if reinitiation is necessary.

- c. It is impossible to count the number of vernal pool fairy shrimp cysts crushed by project activities, and because we do not expect any take due to habitat loss, we are basing the reinitiation threshold on a surrogate. The take we anticipate will result from intrusion into vernal pool habitat and crushing of cysts (intrusions include vehicle and foot traffic, as well as deposition of materials in a vernal pool). Therefore, if the activities intrude into known occupied or potentially

occupied vernal pools on three separate occasions (regardless of the extent of the intrusion), the Air Force must reinitiate consultation with the Service. Any operations causing such intrusions should cease pending reinitiation.

- d. Based on the measures to avoid effects to California red-legged frog breeding habitat and the limited possibility of adversely affecting a California red-legged frog while working in upland vegetation, if one adult or one subadult California red-legged frog is found killed or injured due to project activities, the Air Force must reinitiate consultation with the Service. Any operations causing such take should cease pending reinitiation.

2. The following terms and conditions implement reasonable and prudent measure 2:

- a. The Air Force must request our approval of any biologist who will conduct activities related to this biological opinion at least 15 days prior to any such activities being conducted. Please be advised that possession of a 10(a)(1)(A) permit for the covered species does not substitute for the implementation of this measure. Authorization of Service-approved biologists is valid for this consultation only.
- b. The Air Force must use Service-approved biologists to conduct five (5) pre-activity surveys of the proposed project area for the El Segundo blue butterfly if a project has the potential to adversely affect coast buckwheat plants within areas that are defined by the Service-approved biologist as “likely to be occupied,” and if the actions occur during the time period when El Segundo blue butterflies are typically active (June 1 to September 15). If the surveys are positive the coast buckwheat plants would be considered occupied. If the surveys are negative the coast buckwheat plants would be considered unoccupied habitat for the remainder of the season. However, for surveys to be determined negative they must occur at a time when the environmental conditions would support adults emerging from diapause and a reference site, which is nearest to the project site and that is known to be occupied, must have El Segundo blue butterflies present. In addition, surveys must not occur during poor weather conditions (e.g. rain, fog, high wind), temperature must be at least 60 degrees Fahrenheit with wind speeds of less than 10 miles per hour, and surveys must occur between 9:00 a.m. and 4:00 p.m.
- c. California red-legged frogs must be relocated from all project activities that are near riparian or aquatic habitat and may result in injury or mortality of these individuals. California red-legged frogs may only be captured by hand or dip net and transported in buckets separate from other species. When capturing and removing California red-legged frogs, the Service-approved biologist(s) must minimize the amount of time that animals are held in captivity. California red-legged frogs must be maintained in a manner that does not expose them to

temperatures or any other environmental conditions that could cause injury or undue stress.

- d. Term and Condition 2.c. has the potential to cause the transfer of chytrid fungus between drainages. Therefore, to avoid transferring disease or pathogens between aquatic habitats during the course of surveys and handling of California red-legged frogs, the Service-approved biologist(s) must follow the Declining Amphibian Population Task Force's Code of Practice. A copy of this Code of Practice is enclosed. You may substitute a bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water) for the ethanol solution. Care must be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat.

REPORTING REQUIREMENTS

The Air Force must provide a written report to the Service within 90 days following completion of the proposed project. The report must state the impacts to habitat for the vernal pool fairy shrimp (i.e., intrusions into vernal pool habitat, alterations of hydrology that were repaired) and El Segundo blue butterfly (i.e., loss of host plants). The report must also disclose the number of El Segundo blue butterflies and California red-legged frogs killed or injured, describing the circumstances of the mortalities or injuries if known. The report must also document the number and size of any California red-legged frogs relocated from the action area, the date and time of relocation, and a description of relocation sites. The report must contain a brief discussion of any problems encountered in implementing minimization measures, results of biological surveys and sighting records, and any other pertinent information. We encourage you to submit recommendations regarding modification of or additional measures that would improve or maintain protection of listed species, while simplifying compliance with the Act.

DISPOSITION OF DEAD OR INJURED SPECIMENS

Upon locating a dead El Segundo blue butterfly, vernal pool fairy shrimp, or California red-legged frog, initial notification must be made to the Ventura Fish and Wildlife Office by facsimile at (805) 644-3958 immediately and in writing at the letterhead address within 3 working days. Notification must include the date, time, and location of the carcass; cause of death, if known; and any other pertinent information.

Care must be taken in handling injured specimens to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible state for later analysis. The finder of injured specimens has the responsibility to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed, unless to remove it from the path of further harm or destruction. Should any listed species survive injury, the Service must be contacted regarding their final disposition.

The remains must be placed with educational or research institutions holding the appropriate State and Federal permits, such as the Santa Barbara Natural History Museum (Contact: Paul

Collins, Santa Barbara Natural History Museum, Vertebrate Zoology Department, 2559 Puesta Del Sol, Santa Barbara, California 93460, (805) 682-4711, extension 321).

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. The Air Force should continue conducting surveys of any areas at VAFB that contain coast buckwheat to look for El Segundo blue butterflies, to refine our knowledge of the subspecies' distribution.
2. The Air Force should complete surveys and mapping of all vernal pool habitat on VAFB to determine occupancy by vernal pool fairy shrimp.

REINITIATION NOTICE

This concludes formal consultation on the effects of the project to replace existing electrical lines at VAFB. Reinitiation of formal consultation is required if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may adversely affect listed species or critical habitat in a manner or to an extent not considered in this biological opinion; (3) the agency action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by this action (50 CFR 402.16). In instances where the amount or extent of incidental take is exceeded, the exemption issued pursuant to section 7(o)(2) will have lapsed and any further take would be a violation of section 4(d) or 9. Consequently, we recommend that any operations causing such take cease pending reinitiation.

If you have any questions regarding this biological opinion, please contact Rick Farris of my staff at (805) 644-1766, extension 316.

Sincerely,



Diane K. Noda
Field Supervisor

LITERATURE CITED

- Arnold, R.A. 1983. Ecological studies on six endangered butterflies (Lepidoptera: Lycaenidae); island biogeography, patch dynamics, and the design of habitat preserves. University of California. Publ. in Entomol. 99: 1-161.
- Arnold, R.A. 1986. Studies of the El Segundo blue butterfly-1984. Inland fisheries administrative report No. 86-4. State of California Department of Fish and Game. 39 pp.
- Arnold, R.A. and A.E. Goins. 1987. Habitat enhancement techniques for the El Segundo blue butterfly: an urban endangered species. Integrating man and nature in the metropolitan environment. Proc. Natl. Sym on Urban Wildl., Chevy Chase, MD., 4-7 November 1986, L. W. Adams and D. L. Leedy, eds. Published by Natl Institute for Urban Wildl., 10921 Trotting Ridge Way, Columbia MD 21044.
- Bulger, J.B., N.J. Scott, and R.B. Seymour. 2003. Terrestrial activity and conservation of adult California red-legged frogs *Rana aurora draytonii* in coastal forests and grasslands. Biological conservation 110 (2003): 85-95.
- California Natural Diversity Data Base. 2012. Rarefind: A database application for the California Department of Fish and Game, Natural Heritage Division data, California Natural Diversity Data Base. Sacramento, California.
- Christopher, S.V. 2002. Sensitive amphibian inventory at Vandenberg Air Force Base, Santa Barbara County, California. Summary of Preliminary Results and Site Maps. Appendix A Field Survey Data January 1995 through March 2002.
- Donahue, J.P. 1975. A report on 24 species of California butterflies being considered for placement on the Federal list of endangered or threatened species. Unpublished report submitted to the California Department of Food and Agriculture. 58 pp.
- Eriksen, C.H. and D. Belk. 1999. Fairy shrimps of California's puddles, pools, and playas, Mad River Press, Eureka, California.
- Fidenci, P. 2004. The California red-legged frog, *Rana aurora draytonii*, along the Arroyo Santo Domingo, Northern Baja California, Mexico. The Herpetological Journal, Volume 88. London, England.
- Grismer, L. 2002. Reptiles and amphibians of Baja California, including its Pacific island and the islands in the Sea of Cortez. University of California Press, Berkeley and Los Angeles, California.
- Hayes, M.P. and M.M. Miyamoto. 1984. Biochemical, behavioral and body size differences between *Rana aurora aurora* and *Rana aurora draytonii*. Copeia 1984(4): 1018-1022.

- Hayes, M.P. and M.R. Tennant. 1985. Diet and feeding behavior of the California red-legged frog *Rana aurora draytonii* (Ranidae). The Southwestern Naturalist 30(4): 601-605.
- Helm, B.P. 1998. Biogeography of eight large branchiopods endemic to California. Pages 124-139 in: C. W. Witham, E. T. Bauder, D. Belk, W. R. Ferren Jr. and R. Ornduff, editors. Ecology, conservation, and management of vernal pool ecosystems--Proceedings from a 1996 Conference. California Native Plant Society, Sacramento, California.
- Jennings, M.R. and M.P. Hayes. 1985. Pre-1900 over harvest of California red-legged frogs (*Rana aurora draytonii*): The inducement for bullfrog (*Rana catesbeiana*) introduction. Herpetologica 41(1): 94-103.
- Jennings, M.R., M.P. Hayes, and D.C. Holland. 1992. A petition to the U.S. Fish and Wildlife Service to place the California red-legged frog (*Rana aurora draytonii*) and the western pond turtle (*Clemmys marmorata*) on the list of endangered and threatened wildlife and plants. 21 pp.
- Mattoni, R. 1988. The *Euphilotes battoides* complex: recognition of a species and description of a new subspecies (*Lycaenidae*). Journal of Research on the Lepidoptera 27: 173-185.
- Mattoni, R. 1990. The endangered El Segundo blue butterfly. Journal of research on the Lepidoptera. Vol. 29(4): 277-304.
- Pratt, G.F. 1987. Competition as a controlling factor of *Euphilotes battoides allyni* larval abundance (Lepidoptera: Lycaenidae). Atala, Journal of invertebrate conservation. Vol. 15(1-2): 1-9.
- Pratt, G.F. 1994. Evolution of *Euphilotes* (Lepidoptera: Lycaenidae) by seasonal and host shifts. Biological Journal of the Linnean Society 51: 387-416.
- Proctor, V.W. 1964. Viability of crustacean eggs recovered from ducks. Ecology 45(3): 656-658.
- Proctor, V.W., C.R. Malone, and V.L. DeVlaming. 1967. Dispersal of aquatic organisms: viability of disseminules recovered from the intestinal tract of captive killdeer. Ecology 48(4): 672-676.
- Shields, O. 1975. Studies on North American *Philotes*. IV. Taxonomic and biological notes, and new subspecies. Bull. Allyn Mus. 28. 36 pp.
- Smith, R. and D. Krofta. 2005. Field notes documenting the occurrence of California red-legged frogs in Baja California, Mexico. In litt.
- Soulé, M.E. ed. 1987. Viable populations for conservation. Cambridge University Press, Cambridge, United Kingdom. 189 pp.

Stebbins, R.C. 1985. A field guide to western reptiles and amphibians. Houghton Mifflin Company, Boston, Massachusetts.

Storer, T.I. 1925. A synopsis of the amphibia of California. University of California Publications in Zoology 27: 1-342.

[Air Force] U.S. Air Force. 2010. Flight season surveys for the El Segundo blue butterfly (*Euphilotes battoides allyni*). Prepared by Mantech-SRS Technologies, Inc., and Richard Arnold for 30th Space Wing Asset Management Flight Environmental Conservation.

[Service] U.S. Fish and Wildlife Service. 1976. Endangered and threatened wildlife and plants; determination that six species of butterflies are endangered species. Federal Register 41: 22041.

[Service] U.S. Fish and Wildlife Service. 1996. Endangered and threatened wildlife and plants; determination of threatened status for the California red-legged frog. Federal Register 61: 25813-25833.

[Service] U.S. Fish and Wildlife Service. 1998. Recovery plan for the El Segundo blue butterfly (*Euphilotes battoides allyni*). Portland, Oregon.

[Service] U.S. Fish and Wildlife Service. 2002. Recovery plan for the California red-legged frog (*Rana aurora draytonii*). Portland, Oregon.

[Service] U.S. Fish and Wildlife Service. 2005. Recovery plan for vernal pool ecosystems of California and southern Oregon. U.S. Fish and Wildlife Service, Portland, Oregon. 634 pp.

[Service] U.S. Fish and Wildlife Service. 2007. Vernal pool fairy shrimp (*Branchinecta lynchi*) 5-year review. Sacramento Fish and Wildlife Office, Sacramento, California.

[Service] U.S. Fish and Wildlife Service. 2010. Endangered and threatened wildlife and plants; revised designation of critical habitat for the California red-legged frog, final rule. Federal Register 75 (51): 12815-12864.

[VAFB] Vandenberg Air Force Base. 2011. Biological Assessment: Potential Effects to El Segundo Blue Butterfly, California Red-legged Frog, and Vernal Pool Fairy Shrimp; Replacement of K-Series Electrical Distribution Feeders at Vandenberg Air Force Base, Santa Barbara County, California. October 2011. 13 pp.

Voyles, J., S. Young, L. Berger, C. Campbell, W.F. Voyles, A. Dinudom, D. Cook, R. Webb, R.A. Alford, L.F. Skerratt, and R. Speare. 2009. Pathogenesis of chytridiomycosis, a cause of catastrophic amphibian declines. Science 326: 582-585.

- Wilcox, B.A. and D.D. Murphy. 1985. Conservation strategies: the effects of fragmentation on extinction. *The American Naturalist* 125: 879-887.
- Wright, A.H. and A.A. Wright. 1949. Handbook of frogs and toads of the United States and Canada. Comstock Publishing Company, Inc., Ithaca, New York. xii + appendix.

PERSONAL COMMUNICATIONS

- Arnold, R. 2007. Electronic mail. Density of *Euphilotes* on coast buckwheat. Dated September 14, 2007. Entomological Consulting Services, Ltd. Pleasant Hill, California.
- Ballmer, G. 2006. Electronic mail. El Segundo blue butterfly identification. Dated August 25, 2007. Department of Entomology, University of California Riverside, California.
- Bell, E. 2007. Electronic mail. El Segundo blue butterfly counts on VAFB. Dated July 5, 2007. Biologist. Vandenberg Air Force Base, Santa Barbara County, California.
- Pratt, G. 2006a. Personal discussion regarding El Segundo blue butterflies observed at VAFB. Dated December 19, 2006. Department of Entomology, University of California Riverside, California.
- Pratt, G. 2006b. Electronic mail. El Segundo blue butterflies at VAFB. Dated August 31, 2006. Department of Entomology, University of California Riverside, California.
- Pratt, G. 2006c. Electronic mail. El Segundo blue butterfly identification. Dated August 24, 2007. Department of Entomology, University of California Riverside, California.
- Pratt, G. 2007. Electronic mail. Density of *Euphilotes* on coast buckwheat. Dated September 14, 2007. Department of Entomology, University of California Riverside, California.

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Appendix B-2

National Historic Preservation Act Regulatory Consultation

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**OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION**

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April 23, 2012

Reply in Reference To: USAF120123A

Richard N. Cote - Deputy Base Civil Engineer
Department of the Air Force
30th Space Wing (AFSPC) - 30th Civil Engineer Squadron
1172 Iceland Ave
Vandenberg AFB CA 93437-6012

Re: Section 106 consultation for the *K1, K4, K7 and K8 Overhead Electrical Feeder Line Project*

Dear Mr. Cote:

Thank you for consulting regarding the above cited undertaking. Pursuant to 36 CFR Part 800 (as amended 8-05-04) regulations implementing Section 106 of the National Historic Preservation Act (NHPA), the United States Air Force (USAF), Vandenberg Air Force Base (VAFB) is seeking comments on (1) the Area of Potential Effects (APE); and consensus on the (2) ineligibility of archaeological sites Ca-Sba-932, -2829, -2834, -2836 and -4009H; and, concurrence on (3) "No Adverse Effect" finding for archaeological sites Ca-Sba-0550, -0923, -0927H, -0931, -1130, -2412/2941, -2831, -2946H, -2952 and -3107H.

The undertaking proposes to upgrade five 12kV overhead electrical feeder lines (identified as K1, K4, K8, K6 and K7) that are suspended from wooden poles. The lines originate at Substation K on Bear Creek Road and service Space Launch Complex 3, 4 and 6. Combined, the feeder lines constitute a total of 29.9-linear miles. Proposed work involves (1) demolishing existing wooden poles and replacing each with new wooden poles, (2) relocating portions of lines to new alignments adjacent existing roads, (3) constructing temporary access roads, and (4) project staging. VAFB determined the APE encompasses a 60.0-m wide corridor surrounding existing and proposed new feeder lines, access roads, staging areas and the archaeological sites they connect. Additional communications indicated the vertical depth of the APE is 6 to 8-ft per pole. A mechanical auger mounted on a rubber tire truck will be used for digging holes, and that individual poles will be set into place either by hand, boom-crane staged off site, or helicopter. The APE is depicted in Figures 3A to 3S of the following study (and five appendix reports) you provided as evidence of identifying historic properties:

- *Identification of Historic Properties and Assessment of Adverse Effects, K1, K4, K6, K7 and K8 Feeder Line Replacement Project, Vandenberg Air Force Base, Santa Barbara County, California* (Brasket 2011)

Based on records research, Native American (NA) consultation, the mid-1990s base-wide inventory, and field-work (test excavation and survey) completed at individual sites; VAFB determined the APE includes 17 previously recorded archaeological sites. VAFB indicated two of these sites (Ca-Sbr-1940 and Ca-Sbr-2446) were previously determined ineligible and provided evidence in letters of SHPO consensus dated March 2, 1995 (USFS950210A) and June 20, 2011 (USFS110418A). VAFB indicated four of these sites (Ca-Sba-0550, -0931, -0932 and -2412/2941) were previously determined eligible and provided evidence in letters of SHPO consensus dated December 15, 1977, March 8, 1999 (USAF990216A) and April, 17, 2003 (USAF030224C).

VAFB identified seven of the sites in the APE (Ca-Sba-0923, -0927H, -1130, -2831, -2946H, -2952 and -3107H) as unevaluated resources that will be treated as potentially eligible properties for

purposes of the proposed undertaking. VAFB determined the remaining five sites located in the APE (Ca-Sba-0932, -2829, -2834, -2836 and -4009H) are ineligible and seeks SHPO consensus.

Based on a review of submitted materials and additional communications, I have the following comments:

1. Pursuant to 36 CFR Parts 800.4(a)(1), I find the APE appropriately determined and documented.
2. Pursuant to 36 CFR Part 800.4(b)(1), I find the *Level of Effort* discussed in submitted materials and in additional communications appropriate for identifying historic properties. Please be aware I was initially concerned with the quality of survey completed in the APE as this work was not discussed in submitted materials. Additional communications indicated approximately 83% of the APE had been surveyed with 15.0-m transects (with the remainder receiving less intensive coverage due to steep slopes and dense vegetation) in the mid-1990s as part of the base-wide inventory (VAFB's baseline survey). These communications indicated the physical condition of the APE has not changed since that work was completed. Please be advised VAFB should describe the base-wide inventory in all future submittals when it is used as a basis for survey coverage.
3. I **concur** with the determinations of ineligibility for sites Ca-Sba-0932, -2829, -2834, -2836 and -4009H. In order to remove Ca-Sbr-0932 (previously determined eligible through SHPO consensus) from the California Register of Historic Resources, a separate action notifying the Registration Unit of my office needs to be initiated by VAFB.
4. For demolition - I find the treatments described in your submittal appropriate for avoiding impacts to Ca-Sba-0550, -0923, -0927H, -0931, -1130, -2412/2941, -2831, -2946H, -2952 and -3107H as they will consist of one or more of the following:
 - A. In-place abandonment of existing poles
 - B. Hand felling of existing poles at ground level
 - C. Removal of felled poles by bucking poles into smaller pieces and hand carry
 - D. Removal of felled poles by boom-crane staged on existing roads or off-site, or by helicopter
 - E. Use of environmental fencing for avoidance
 - F. Archaeological monitoring of the above activities
5. For construction - Though no specific treatments were provided for construction, I find the proposed undertaking will not impact Ca-Sba-0550, -0923, -0927H, -0931, -1130, -2831, -2952 and -3107H for the following reasons:
 - A. Ca-Sba-0923, -0927H, -0931, -2831, -2952 and -3107H will be avoided as the new feeder line alignment has been located outside site boundaries.
 - B. VAFB worked in consultation with the Santa Ynez Band of Chumash Indians for moving the existing pole on the feeder line (K1) that traverses the site to a new location outside the viewshed of the main rock art panel at site Ca-Sba-0550 and because VAFB indicated such sites at the base typically contain no subsurface component.
 - C. Test excavations identified no subsurface component within the existing feeder line alignment (K7) where the three new poles will be installed at prehistoric site Ca-Sba-1130.
6. For construction - I find there will be an effect to previously determined eligible prehistoric site Ca-Sba-2412/2941 and assumed eligible historic archaeological site Ca-Sba-2946, however I find the effect will not be adverse for the following reasons:
 - A. Archaeological testing completed at Ca-Sba-2412/2941 indicated the proposed location of three new poles on the existing K7 feeder line alignment that bisects the site are outside the

three artifact concentrations and in an area exhibiting a significant decrease in the frequency and diversity of prehistoric remains.

- B. Field survey completed at Ca-Sba-2946H found only one fragment of non-diagnostic porcelain and no evidence of structural remains within the existing K7 feeder line alignment that bisects the site where two new poles will be installed.
7. Based on the above comments, I **concur** with a finding of "No Adverse Effect" pursuant to 36 CFR Part 800.5(b) with the following conditions:
- A. VAFB implement archaeological monitoring during construction activities at assumed eligible historic archaeological site Ca-Sba-2946H and eligible prehistoric site Ca-Sba-2412/2941.
 - B. For installing new poles at the above two sites, VAFB require the auger mounted rubber tire truck to approach and exit the new pole locations on the same route of travel so as to avoid making ground disturbing acute turns and multiple trails within site boundaries.
 - C. VAFB install the one new pole at eligible rock art site Ca-Sba-0550 by means of hand carry or boom-crane so as to avoid potential impacts to rock art caused by wind generated from a helicopter.
 - D. If you agree to the above proposed conditions, please evidence your agreement by signing the signature block below. Also, please return the letter to me as soon as possible or provide me with a separate letter concurring on the proposed conditions.

Be advised that under certain circumstances, such as an unanticipated discovery or a change in project scope, VAFB may have additional future responsibilities for the undertaking under 36 CFR Part 800. Thank you for considering historic properties during project planning. If you have any questions, please contact Jeff Brooke of my staff at (916) 445-7003 or jbrooke@parks.ca.gov.

Sincerely,

Susan H Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

	Date: 25 Apr 12
Richard N. Cote - Deputy Base Civil Engineer Department of the Air Force	

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Appendix B-3

Native American Consultation

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DEPARTMENT OF THE AIR FORCE

30TH SPACE WING (AFSPC)

January 5, 2012

Christopher Ryan
30CES/CEANC
1028 Iceland Avenue
Vandenberg AFB CA 93437-6010

Mr. Sam Cohen
Santa Ynez Band of Chumash Indians
P.O. Box 517
Santa Ynez, California 93460

Dear Sam:

With this letter, the 30th Space Wing of the United States Air Force, Vandenberg Air Force Base (VAFB), is continuing consultation with the Santa Ynez Band of Chumash Indians (SYBCI) for the proposed K1, K4, K6, K7, and K8 Feeder Lines Replacement project in accordance with Section 106 of the National Historic Preservation Act. The project would improve electrical supply to critical launch and support facilities by installing approximately 30 miles of new electrical feeder lines and poles along an alignment that permits easy access for the purposes of regular maintenance.

Purpose of the Project

The purpose of the proposed project is to replace five outdated 12 kilovolt overhead electrical feeder lines that are suspended from a single wood pole support system to ensure a reliable and continuing power source to critical facilities. These electrical feeder lines support the South Base cantonment area, several space launch complexes, radar tracking stations, and other facilities critical to the security and mission of the base. Many segments of these feeder lines traverse steep terrain without any vehicular access points. The corrosive salt air and difficulty in accessing these lines for maintenance has led to degradation of electrical lines and equipment, and has resulted in power failure. One goal of the project is to enable access for routine maintenance. Therefore, all new feeder lines will either be established next to existing roads, or new permanent gravel access roads will be built adjacent to the feeder lines.

Project Description

Each of the five K circuit electrical feeder lines originate from Substation K on Bear Creek Road. To facilitate regular maintenance of the lines, some portions will be realigned along existing roads or have new access roads built underneath or adjacent to the line. Along segments where the existing lines are already located adjacent to a road, new poles and electrical equipment will be built within twenty feet of the existing line. Once the new line is constructed the old one will be dismantled and removed. Construction of new feeder lines will be a three-step process. First, access routes along the proposed line will be established as needed. Second, concrete poles will be set in, replacing existing wooden poles. And third, cross arms and other hardware will be installed, followed by hanging the new electrical cable.

New access routes will be graded and cleared of vegetation to a maximum width of 15 feet and then overlaid with gravel to prohibit vegetation re-growth. At each location where a new pole will be installed, a

10-foot-diameter circle will be cleared of vegetation and a geotechnical fabric will be laid on the ground surface and covered with gravel. This is intended to act as a fuel break around each pole in case of wildfire and to facilitate ease of access to the pole for routine maintenance. An approximately 2-foot-diameter hole will be dug to a depth of 6-10 feet for each pole. A boom truck that can reach 20 feet will then be used to install poles.

Demolition will include cutting electrical cable from poles and loading it into trucks or roll-off bins. Wood poles will be felled at ground level, loaded onto trucks by a boom truck, and disposed of. For poles that are located within archaeological sites, a non-ground disturbing method will be employed to avoid impacts to the site. These methods may include felling at ground level, bucking, and carrying out by hand; removal of the pole by helicopter; or by staging a boom truck outside of site boundaries or from an existing road and lifting the poles off site. Orange exclusionary fencing and monitors will be used to keep people and equipment from encroaching on significant site deposits.

Access routes will include temporary roads to demolish existing feeder lines that will not be replaced in their current alignment, and permanent fifteen foot wide gravel access roads along new construction. The temporary access routes would either use ephemeral unmaintained roads that would be cleared of vegetation, or in some cases, access would be gained by driving over existing vegetation to remove poles and electrical equipment. Staging areas will be established to lie down and stock pile wood poles and electrical line and store equipment and vehicles. The staging areas will be established on pavement or dirt turnouts and are included in the APE.

Project Location

Each of the feeder lines begins at Substation K on Bear Creek Road and traverses hilly terrain to service various facilities. The K1 feeder extends south from the substation parallel to Arguello Road, crosses Honda Canyon, and then runs west along Honda Ridge Road to Space Launch Complex (SLC) 6. The K4 feeder traverses cross country two miles west to service SLC-4. The K6 feeder runs 0.8 miles east to SLC 3. The K8 feeder runs east from the substation, travels cross country to Santa Ynez Road where it takes a southerly turn, parallels Santa Ynez Road, and then connects to the K1 circuit at Arguello Road. The K7 feeder extends east cross country from the substation to Santa Ynez Road and then travels south to Clark Street where it then turns west towards the ocean along the northern edge of the Lompoc Terrace.

The Area of Potential Effects

The Area of Potential Effects (APE) was delineated by VAFB archaeologists and project engineers during the project design phase. The APE encompasses a 60 meter (192 foot) wide corridor based on the centerline of the feeder lines, archaeological sites within and partially within the corridor, access roads, and staging areas. Additionally, an Area of Direct Impacts (ADI) was developed to include those areas that would sustain ground disturbance during demolition and construction. The ADI is a 15 meter (50 foot) corridor based on both the existing and proposed powerline centerlines.

Resources within the APE

A comprehensive review of VAFB cultural resource records was conducted. The APE contains 17 previously recorded sites and one site that was recorded during the course of this project. Three sites have been previously determined eligible and two sites were previously determined ineligible. Eligibility evaluations were conducted at six sites and seven sites were assumed eligible for this project only. Eligibility and effects testing results are presented in the attached report (Enright et al. 2011).

Findings

After evaluation, VAFB determined that the following five cultural resource sites do not meet the NRHP criteria of significance appendices and, as such, are not eligible for listing on the NRHP:

CA-SBA-0932
CA-SBA-2829
CA-SBA-2834
CA-SBA-2836
CA-SBA-4009H

VAFB applied the criteria of effect at each of the three historic properties identified within the APE and at each of the seven cultural resources assumed to be eligible for the purposes of this project only. Where necessary, the project development team worked to avoid and minimize impacts to historic properties by modifying the project design and/or imposing conditions on project construction and/or demolition activities. As a result, VAFB determined and is seeking SHPO concurrence that the proposed project will have no adverse effect to any of the historic properties within the APE, which are listed below:

CA-SBA-0550	Previously Determined Eligible
CA-SBA-0931	
CA-SBA-2412/2941	
CA-SBA-0923	Unevaluated: Assumed Eligible for the Purposes of this Project
CA-SBA-0927H	
CA-SBA-1130	
CA-SBA-2831	
CA-SBA-2946H	
CA-SBA-2952	
CA-SBA-3107H	

Attached to this letter is the eligibility and effects testing report prepared by Applied Earthworks (Enright et al. 2011). If you would like to perform a site visit, please let me know and we can schedule a date and time together. If you would like additional information or have any questions, please do not hesitate to contact me at 606-0748 or via e-mail at christopher.ryan@vandenberg.af.mil. Thank you very much for your assistance.

Sincerely,

Christopher Ryan

Christopher Ryan, 30 CES/CEANC
Cultural Resources Team Leader

1 Attachment:

1. Enright et al. 2011

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DEPARTMENT OF THE AIR FORCE
30TH SPACE WING (AFSPC)

Christopher Ryan
30th Civil Engineer Squadron
1028 Iceland Avenue
Vandenberg AFB, CA 93437-6010

Mr. Sam Cohen
Santa Ynez Band of Chumash Indians
P.O. Box 517
Santa Ynez, CA 93460

Dear Sam:

The 30th Space Wing of the United States Air Force, Vandenberg Air Force Base (VAFB), is initiating consultation with the Santa Ynez Band of Chumash Indians for the K Circuit Feeder Lines Replacement project. The consultation is undertaken in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, and the implementing regulations [36 CFR Part 800].

VAFB proposes to improve electrical supply to mission critical launch and launch support facilities on south base by installing new electrical feeder lines and associated wood poles along an alignment that permits easy access for the purposes of regular maintenance. The existing electrical feeder lines and associated poles for the K Circuit are over 30 years old. Typical problems associated with the existing lines include corrosion of steel hardware, corrosion of the steel core of the actual electrical conductors, deterioration of the cross arms, and charring damage to the poles due to brush fires and pole-top fires.

Where possible, segments of the feeder line that are currently traversing cross country will be removed and realigned along existing roads. Otherwise, the feeder lines will remain in their existing alignment and poles will be replaced where they currently stand.

A segment of feeder line is aligned along the south facing slope in front of the Honda Ridge Rock Art Site (CA-SBA-550). One power pole is located on the edge of the trail in front of the rock art viewing platform and another pole is located near the head of the trail (Attachment 1). During project planning, several options were considered to eliminate or reduce the visual impact of the feeder line to the Honda Ridge Rock Art Site.

In Option 1, the existing distribution line route would remain as is. The power pole on the edge of the trail in front of the viewing platform would be cut off at its base and two new power poles would take its place, one to the east of the rock art panel and one to the west. This option would remove the pole closest to the viewing platform but would not completely

eliminate feeder line from the view shed of site. Options 2 and 3 consider two alternatives for re-routing the feeder line to the north of the site along the Building 518 access road and would remove the feeder line from the view shed of the site.

To consider the feasibility of the options, a geologic/geotechnical engineering study that was recently undertaken for slope stability along the north side of the ridge by Bengal Engineering, Inc. for another project and was used for analysis in this project. They also performed a geologic reconnaissance for the options listed above. There are documented landslide issues along the CDT access road and a deep-seated landslide complex on the north side of Building 518, which would present unstable and challenging conditions for Options 2 and 3. It is the recommendation of the geologic engineers that Options 2 and 3 not be implemented.

Therefore, VAFB wishes to consult with you to discuss implementation of Option 1, or to simply replace the poles in their current location. We propose a site visit to the Honda Ridge Rock Art Site no later than Wednesday May 4, 2011.

If you have any questions or require additional information, please contact me, or Kelli Brasket at (805) 606-9687. Thank you for your assistance with this matter.

Sincerely

Christopher Ryan

CHRISTOPHER RYAN
Cultural Resources Team Leader

1 Attachment: K1 Electrical Distribution Line at the Honda Ridge Rock Art Site

Appendix B-4

Coastal Zone Management Act Regulatory Consultation

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CALIFORNIA COASTAL COMMISSION

45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE (415) 904-5200
FAX (415) 904-5400
TDD (415) 597-5885



July 9, 2012

Beatrice L. Kephart
Chief, Asset Management Flight
ATTN: Dina Ryan
30 CES/CEA
1028 Iceland Avenue
Vandenberg AFB, CA 93437-6010

Subject: Negative Determination ND-022-12 (Repair and replacement of overhead electrical lines, Vandenberg AFB, Santa Barbara County)

Dear Ms. Kephart:

The Coastal Commission staff has reviewed the above-referenced negative determination. The Air Force proposes to repair and replace aging overhead electrical distribution lines (Feeders K1, K4, K6, K7, K8, N5, N9, and N10) on South Vandenberg Air Force Base. The Air Force states that the existing lines do not provide a reliable power source required to support Vandenberg AFB's launch and range missions and must be replaced. Approximately 31 miles of existing overhead lines would be replaced with approximately 33.7 miles of new lines. The replacement overhead lines would be located adjacent to existing roads or within close proximity to the old lines to the extent feasible to provide easy access and facilitate regular maintenance. In areas where the new feeder alignments cannot be located near existing roads, new access roads would be established. Following installation, testing, and initial operation of the new lines, the existing wires, electrical equipment, and poles would be removed. In environmentally sensitive areas, poles would be removed in stages and the use of non-invasive techniques (e.g., removal by helicopter, manual transport to roads) will be used. The replacement project is expected to take up to five years to complete.

Project construction activities hold the potential to temporarily affect soils, vegetation, and water quality at and adjacent to work areas. All exposed soil areas will be revegetated with a native seed mix and sufficient mulch to prevent erosion. The Air Force will implement a Stormwater Pollution Prevention Plan and incorporate best management practices into the project design to avoid adverse effects to water resources. The Air Force undertook formal consultation with the U.S. Fish and Wildlife Service due to known and potential occurrence of federally threatened and endangered species within the project area. The Service issued a Biological Opinion on May 9, 2012, stating that the proposed project would not jeopardize the continued existence of any federally listed species, and the Air Force stated that it would comply with all reasonable and prudent measures and all terms and conditions listed in the Biological Opinion to protect the El Segundo blue butterfly, vernal pool fairy shrimp, and California red-legged frog. The Air Force

also undertook consultation with the California State Historic Preservation Office (SHPO) to comply with Section 106 of the National Historic Preservation Act due to the presence of sensitive archaeological resources near Feeder Lines K1 and K7. In a letter dated April 23, 2012, the SHPO concurred with the Air Force's determination that the project will not adversely affect archaeological resources given a slight redesign in the project to avoid archaeological resources and implementation of cultural resource protection measures.

In conclusion, the Commission staff **agrees** that the proposed project will not adversely affect coastal resources. We therefore **concur** with your negative determination made pursuant to 15 CFR 930.35 of the NOAA implementing regulations. Please contact Larry Simon at (415) 904-5288 should you have any questions regarding this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "Charles Lester", written in a cursive style.

(for)

CHARLES LESTER
Executive Director

cc: CCC – South Central Coast District

Appendix C

Avoidance, Minimization, Monitoring, and Reporting Measures: Tracking Sheet

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APPENDIX C – Avoidance, Minimization, Monitoring, and Report Measures: Tracking Sheet

#	<i>Avoidance, Minimization, Monitoring, Reporting Measures K1 and K7 Feeder Replacement, Vandenberg AFB</i>	<i>Responsible Organization</i>	<i>Deliverable/ Report</i>	<i>Compliance Schedule</i>
1	Terms and Conditions from the United States Fish and Wildlife Service (USFWS) Biological Opinion: If one (1) adult or larva of the El Segundo blue butterfly is found killed or injured due to project activities, Vandenberg Air Force Base (VAFB) must notify the Ventura Fish and Wildlife Office immediately. If a second adult or larval El Segundo blue butterfly is found killed or injured by project activities, VAFB must reinitiate formal consultation with the USFWS. In instances where the amount or extent of incidental take is exceeded, any operations causing such take would cease pending re-initiation.	AF and AF Biological Resources Contractor	Daily notifications & monitoring reports submitted to 30 CES/ CEANC	During Construction Activities
2	Term and Condition from USFWS Biological Opinion: If 300 coast buckwheat plants are removed during the project activities, VAFB must reinitiate formal consultation with the USFWS. Once this limit is reached, any actions causing the loss of additional host plants would cease pending re-initiation. Prior to initiating the project, VAFB will have a USFWS-approved biologist survey the route and estimate the number of coastal buckwheat plants that are likely to be removed. If the USFWS' estimate of 300 plants proves to be incorrect, VAFB will contact the USFWS to revise the number accordingly. This revision would not require re-initiation because the USFWS have anticipates a low number based upon proposed avoidance and minimization measures and a smaller project footprint; however, if VAFB determines through pre-project surveys that substantially more than 300 coastal buckwheat plants may be removed, the USFWS will re-evaluate its effects analysis to determine if re-initiation is necessary.	AF and AF Biological Resources Contractor	Daily notifications & monitoring reports submitted to 30 CES/ CEANC	Prior and During Construction Activities
3	Term and Condition from USFWS Biological Opinion: If Proposed Action activities intrude into known occupied or potentially occupied vernal pools on three separate occasions (regardless of the extent of the intrusion), VAFB must reinitiate consultation with the USFWS. Any operations causing such intrusions would cease pending re-initiation.	AF and AF Biological Resources Contractor	Daily notifications & monitoring reports to 30 CES/ CEANC	During Construction Activities
4	Term and Condition from USFWS Biological Opinion: Based on the measures to avoid effects to California red-legged frog breeding habitat and the limited possibility of adversely affecting a California red-legged frog while working in upland vegetation, if one adult or one subadult California red-legged frog is found killed or injured due to project activities, VAFB must reinitiate consultation with the USFWS. Any operations causing such take would cease pending re-initiation.	AF and AF Biological Contractor	Immediate notification to 30 CES/CEANC and USFWS	Daily inspections prior to construction activities in known CRLF habitat areas
5	Term and Condition from USFWS Biological Opinion: VAFB must request the USFWS's approval of any biologist who will conduct activities related to this biological opinion at least 15 days prior to any such activities being conducted. Possession of a 10(a)(1)(A) permit for the covered species does not substitute for the implementation of this measure. Authorization of USFWS-approved biologists is valid for consultation #8-8-11-F-15 only.	AF	AF coordination with USFWS	15 days prior to any construction activities
6	Term and Condition from USFWS Biological Opinion: VAFB must use USFWS-approved biologists to conduct five preactivity surveys of the proposed project area for the El Segundo blue butterfly if a project has the potential to adversely affect coast buckwheat plants within areas that are defined by the USFWS-approved biologist as "likely to be occupied," and if the actions occur during the time period when El Segundo blue butterflies are typically active (June 1 to September 15). If the surveys are positive the coast buckwheat plants would be considered occupied. If the surveys are negative the coast buckwheat plants would be considered unoccupied habitat for the	AF and AF Biological Contractor	Monitoring reports submitted by biological contractor to 30 CES/ CEANC and USFWS	Prior to construction activities.

AMMR Tracking Sheet

#	<i>Avoidance, Minimization, Monitoring, Reporting Measures K1 and K7 Feeder Replacement, Vandenberg AFB</i>	<i>Responsible Organization</i>	<i>Deliverable/ Report</i>	<i>Compliance Schedule</i>
	remainder of the season. However, for surveys to be determined negative they must occur at a time when the environmental conditions would support adults emerging from diapause and a reference site, which is nearest to the project site and that is known to be occupied, must have El Segundo blue butterflies present. In addition, surveys must not occur during poor weather conditions (e.g. rain, fog, high wind), temperature must be at least 60 degrees Fahrenheit with wind speeds of less than 10 miles per hour, and surveys must occur between 9:00 a.m. and 4:00 p.m.			
7	Term and Condition from USFWS Biological Opinion: California red-legged frogs must be relocated from all project activities that are near riparian or aquatic habitat and may result in injury or mortality of these individuals. California red-legged frogs may only be captured by hand or dip net and transported in buckets separate from other species. When capturing and removing California red-legged frogs, the USFWS-approved biologist(s) must minimize the amount of time that animals are held in captivity. California redlegged frogs must be maintained in a manner that does not expose them to temperatures or any other environmental conditions that could cause injury or undue stress. This Term and Condition has the potential to cause the transfer of chytrid fungus between drainages. Therefore, to avoid transferring disease or pathogens between aquatic habitats during the course of surveys and handling of California redlegged frogs, the USFWS-approved biologist(s) must follow the Declining Amphibian Population Task Force's Code of Practice. A copy of this Code of Practice is enclosed. You may substitute a bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water) for the ethanol solution. Care must be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat.	AF and AF Biological Contractor	Immediate notification from biological contractor to 30 CES/ CEANC	Prior to construction activities.

#	<i>Avoidance, Minimization, Monitoring, Reporting Measures K1 and K7 Feeder Replacement, Vandenberg AFB</i>	<i>Responsible Organization</i>	<i>Deliverable/ Report</i>	<i>Compliance Schedule</i>
8	Reporting Requirements from USFWS Biological Opinion: VAFB must provide a written report to the USFWS within 90 days following completion of the proposed project. The report must state the impacts to habitat for the vernal pool fairy shrimp (i.e., intrusions into vernal pool habitat, alterations of hydrology that were repaired) and El Segundo blue butterfly (i.e., loss of host plants). The report must also disclose the number of El Segundo blue butterflies and California red-legged frogs killed or injured, describing the circumstances of the mortalities or injuries if known. The report must also document the number and size of any California red-legged frogs relocated from the action area, the date and time of relocation, and a description of relocation sites. The report must contain a brief discussion of any problems encountered in implementing minimization measures, results of biological surveys and sighting records, and any other pertinent information.	AF and AF Biological Contractor	Disclosure Report	90 days following project completion
9	Disposition of Dead or Injured Specimens Requirements from USFWS Biological Opinion: Upon locating a dead El Segundo blue butterfly, vernal pool fairy shrimp, or California redlegged frog, Vandenberg AFB will make initial notification to the Ventura Fish and Wildlife Office by facsimile at (805) 644-3958 immediately and in writing at the letterhead address within three working days. Notification will include the date, time, and location of the carcass; cause of death, if known; and any other pertinent information. Care will be taken in handling injured specimens to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible state for later analysis. The finder of injured specimens will be responsible in ensuring that evidence intrinsic to the specimen is not unnecessarily disturbed, unless to remove it from the path of further harm or destruction. Should any listed species survive injury, the USFWS will be contacted regarding their final disposition. The remains will be placed with educational or research institutions holding the appropriate State and Federal permits, such as the Santa Barbara Natural History Museum			
10	Condition from the California State Historic Preservation Officer: Vandenberg AFB will implement the following protection measures at archaeological sites in the project area: a. CA-SBA-2946H and CA-SBA-2412/2941 will have archaeological and Native American monitors present during construction activities. For installing new power poles at the sites, an auger mounted rubber tire truck will be used to approach and exit the new pole locations on the same route of travel so as to avoid making ground disturbing acute turns and multiple trails with site boundaries. b. CA-SBA-550: new power pole installation will be conducted by either hand-carrying the pole and equipment or via a boom-crane.	AF and AF Cultural Resources Contractor	Daily notifications & monitoring reports submitted to 30 CES/ CEANC	During construction activities

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