



Diverse Communications Project at Vandenberg Air Force Base



Supplemental Environmental Assessment

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**DIVERSE COMMUNICATIONS PROJECT AT VANDENBERG AIR FORCE BASE
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT**

AGENCY: Missile Defense Agency

ACTION: Finding of No Significant Impact

BACKGROUND: The Missile Defense Agency (MDA) is responsible for developing, testing, and deploying the Ballistic Missile Defense System (BMDS). The BMDS is designed to intercept threat missiles during all phases of their flight: boost, midcourse, and terminal. Ground-Based Midcourse Defense (GMD) is an element of the midcourse defense, during which the Ground-Based Interceptors (GBIs) intercept and destroy long-range missiles during the ballistic (midcourse) phase of their flight before their reentry into the Earth's atmosphere. In December 2002, the President directed the Department of Defense (DOD) to field a set of initial missile defense capabilities beginning in 2004. In support of this directive, MDA established operational Ground-Based Interceptor (GBI) launch facilities at Vandenberg Air Force Base (AFB), California, as part of an initial defense of the United States from a limited ballistic missile attack. This included installation of communications cables between support facilities and missile silos. These activities were previously analyzed in the *GMD Initial Defensive Operations Capability at Vandenberg Air Force Base Environmental Assessment (IDOC EA)*, August 2003, which is hereby incorporated by reference.

The MDA prepared this Supplemental Environmental Assessment (SEA), which is hereby incorporated by reference, to evaluate the potential environmental consequences of constructing and operating a diverse communications system to support the GMD at Vandenberg AFB. The attached SEA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, and its implementing regulations, 42 United States Code 4321 et seq. and 40 Code of Federal Regulations (CFR) 1500-1508, respectively; 32 CFR Part 651, *Environmental Analysis of Army Actions*; and 32 CFR 989, *Environmental Impact Analysis Process*. The purpose of the Proposed Action is to construct a diverse communications system at Vandenberg AFB to provide redundancy to the current GMD components.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES:

MDA proposes construction of a diverse communications system at Vandenberg AFB to support the capability to launch defensive GBI missiles from Vandenberg AFB. A diverse communications system would provide redundancy to the current operational GMD communication system as well as physical separation between the two systems (diversity). The project would use existing Vandenberg AFB communications infrastructure wherever possible. Along the routes identified for the diverse communications system, there are six locations where existing communications infrastructure is either inadequate or unavailable for MDA use. MDA plans to install new underground communications lines, manholes (MH), and handholes (HH) at these six locations for a total of approximately 31,500 feet of new lines.

In accordance with the Federal regulations for implementing NEPA, the SEA also analyzes the No Action Alternative, which serves as the baseline from which to compare the Proposed Action. Under the No Action Alternative, the MDA would not construct and operate a diverse communications system.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES: Each environmental resource was evaluated for impacts from activities associated with implementing the Proposed Action. No further evaluation was conducted for those resources where impacts from the Proposed Action are the same as

those described in the GMD IDOC EA. Specifically, the SEA did not analyze air quality, water resources, geology and soils, infrastructure, land use, socioeconomics, and environmental justice because the GMD IDOC EA adequately evaluated and described impacts, and the Proposed Action in this SEA is not expected to cause impact beyond those discussed in the GMD IDOC EA. The GMD IDOC EA found no significant impact to these resource areas from construction and operation of GMD IDO [now called Limited Defensive Operations (LDO)] at Vandenberg AFB. Therefore, this SEA evaluates the potential impacts to only biological resources (threatened and endangered special-status species), cultural resources, and coastal zone management.

All Proposed Action activities would be conducted in compliance with applicable Federal, state, and local regulations and requirements. The following paragraphs summarize the potential effects on biological resources (special-status species) cultural resources, and coastal zone management at Vandenberg AFB.

Biological Resources (Special-Status Species). Surveys of the project site at Vandenberg AFB have determined the presence of federally endangered Gaviota tarplant, the unarmored threespine stickleback, and potential suitable habitat for the endangered El Segundo blue butterfly; those areas where coast buckwheat (the El Segundo blue butterfly's host plant) occurs. Surveys also determined the presence of the federally threatened California red-legged frog. On June 20, 2008, Vandenberg AFB received a Biological Opinion prepared by the US Fish and Wildlife Service (USFWS). The USFWS in its Biological Opinion concurred with the Vandenberg AFB determination that the Proposed Action may affect, but is not likely to adversely affect the Gaviota tarplant because the MDA would implement measures to avoid adverse effects to the Gaviota tarplant and because only approximately 0.06 acre would be temporarily affected, mostly in habitats that are routinely impacted by maintenance and mowing activities. The Biological Opinion also concluded that the Proposed Action could adversely affect the El Segundo blue butterfly, unarmored threespine stickleback, and the California red-legged frog, but minimization measures would reduce adverse impacts and therefore the Proposed Action would not jeopardize the continued existence of the El Segundo blue butterfly, unarmored threespine stickleback, or California red-legged frog. The USFWS was able to reach this conclusion because:

1. Implementing the Proposed Action would only result in temporary adverse effects to the El Segundo blue butterfly, unarmored threespine stickleback, California red-legged frog, and their respective habitats;
2. The MDA would implement a frac-out contingency plan to minimize the effects of a frac-out, which should reduce the downstream effects to the California red-legged frog and unarmored threespine stickleback; and
3. The MDA has included measures in the Proposed Action to minimize and reduce the adverse effects on the El Segundo blue butterfly, unarmored threespine stickleback, and California red-legged frog.

Cultural Resources. Eight archaeological were identified within 100 feet of the various diverse communications project routes. Three of the sites were determined to be outside the area of potential effects. Of the remaining five sites, Vandenberg AFB determined the proposed project would have no adverse effects on three sites and no effect on the other two sites. Vandenberg AFB would continue to consult with the Santa Ynez Band of Chumash Indians on this project. Vandenberg AFB determined that archaeological and Native American monitoring would be required during the cable installation at one of the sites. The California State Historic Preservation Office concurred with the finding of no adverse effect on March 24, 2008.

Coastal Zone Management. Most of the proposed diverse communication line activities at Vandenberg AFB would take place outside of the coastal zone. Only those activities for the launch facility sites would be within the coastal zone. Under the Proposed Action, the MDA and USAF would

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comply with Federal Coastal Zone Consistency regulations (15 CFR Part 930) and the California Coastal Zone Management Program. Because the proposed activities would not have a significant impact on physical and natural resources, require implementation of new restrictions to beach access or other recreational areas, or adversely affect the visual qualities of the coastline, Vandenberg AFB anticipated that the proposed activities would be found to be consistent with the goals and objectives of the California program. As part of coordination and consultation with the California Coastal Commission, a Negative Determination was sent to the Commission for their review and comment. The California Coastal Commission concurred with the Negative Determination and agreed in their June 2, 2008 letter that the proposed Diverse Communication System will not adversely affect coastal zone resources.

CONCLUSION: Based on analysis of the proposed construction and operation of a diverse communications system for MDA at Vandenberg AFB, this SEA identified no significant impacts affecting the quality of the human environment. Preparation of an Environmental Impact Statement is not required.

DEADLINE FOR RECEIPT OF WRITTEN COMMENTS: Fifteen days from the date of public notice.

POINT OF CONTACT: Submit written comments or requests for a copy of the Diverse Communications Project at Vandenberg Air Force Base SEA to the address below. The SEA and draft Finding of No Significant are also available on the Internet at: <http://www.mda.mil/mdalink/html/enviro.html>.

US Army Space and Missile Defense Command/Army Strategic Command
Attention: SMDC-EN-V (David Hasley)
Post Office Box 1500
Huntsville, AL 35807-3801

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**FINDING OF NO SIGNIFICANT IMPACT
for
DIVERSE COMMUNICATIONS PROJECT AT VANDENBERG AIR FORCE BASE
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT**

AGENCY: United States Air Force (USAF)

CONCUR:

STEVEN W. WINTERS, Colonel, USAF
Vice Commander, 30th Space Wing
Chairman, Environmental, Safety, and Occupational Health Council
Vandenberg AFB, CA

DATE

APPROVED:

CHRIS PUCKETT
SES, DAF
Director of Installations and Logistics

Date

AGENCY: Missile Defense Agency (MDA)

APPROVED:

ALBERT D. HEMPHILL II
Deputy for Agency Operations

Date

TABLE OF CONTENTS

	<u>Page</u>
TABLE OF CONTENTS	i
ACRONYMS AND ABBREVIATIONS	iii
<u>1.0 PURPOSE OF AND NEED FOR ACTION</u>	1
1.1 BACKGROUND	1
1.2 PURPOSE AND NEED	1
1.3 SUPPORTING ENVIRONMENTAL PLANS, PERMITS, AND CONSULTATIONS .	1
1.4 PUBLIC NOTIFICATION AND REVIEW	2
<u>2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES</u>	3
2.1 PROPOSED ACTION	3
2.1.1 INSTALLATION LOCATIONS	3
2.1.1.1 LF 21, LF 23, and LF 24	3
2.1.1.2 LF 02 and LF 03	5
2.1.1.3 El Rancho Road and RIDT (Building 1914).....	5
2.1.1.4 Bishop Road	6
2.1.1.5 San Antonio Road West	6
2.1.1.6 Cross Road and Building 1768	6
2.1.2 INSTALLATION METHODS	7
2.1.2.1 Plowing.....	7
2.1.2.2 Trenching	7
2.1.2.3 Horizontal Directional Drilling (HDD) Boring	8
2.1.3 AVOIDANCE AND MINIMIZATION MEASURES	9
2.1.3.1 California Red-legged Frog (<i>Rana aurora draytonii</i>)	10
2.1.3.2 Coast Horned Lizard (<i>Phrynosoma coronatum frontale</i>).....	11
2.1.3.3 El Segundo Blue Butterfly (<i>Euphilotes battoides allyni</i>).....	12
2.1.3.4 Gaviota Tarplant (<i>Deinandra increscens</i> subspecies <i>villosa</i>).....	13
2.1.3.5 Two-striped Garter Snake (<i>Thamnophis hammondi</i>)	15
2.1.3.6 Unarmored Threespine Stickleback (<i>Gasterosteus aculeatus williamsoni</i>).....	15
2.1.3.7 Southwestern Pond Turtle (<i>Emys marmorata pallida</i>)	15
2.1.3.8 Vernal Pool Fairy Shrimp (<i>Branchinecta lynchi</i>).....	16
2.2 NO ACTION ALTERNATIVE	16
2.3 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD	16
<u>3.0 AFFECTED ENVIRONMENT</u>	17
3.1 BIOLOGICAL RESOURCES	20
3.1.1 SPECIAL-STATUS SPECIES	20
3.1.2 HABITATS	25
3.2 CULTURAL RESOURCES	26
3.3 COASTAL ZONE MANAGEMENT	28
<u>4.0 ENVIRONMENTAL CONSEQUENCES</u>	29
4.1 BIOLOGICAL RESOURCES	29
4.1.1 IMPACTS TO SPECIAL-STATUS SPECIES	29
4.1.2 IMPACTS TO HABITAT	33
4.1.3 CUMULATIVE EFFECTS	33
4.1.4 MITIGATING MEASURES	33
4.2 CULTURAL RESOURCES	35
4.3 COASTAL ZONE MANAGEMENT	35
4.4 ENVIRONMENTAL EFFECTS OF THE NO ACTION ALTERNATIVE	36
<u>5.0 LIST OF REFERENCES</u>	37

6.0 LIST OF AGENCIES AND ORGANIZATIONS CONTACTED..... 40
7.0 LIST OF PREPARERS..... 41
8.0 DISTRIBUTION LIST..... 42

APPENDIX A US Fish and Wildlife Service Response..... A-1
APPENDIX B State Historic Preservation Officer Correspondence..... B-1
APPENDIX C California Coastal Commission Response..... C-1

LIST OF FIGURES

Figure 2.1-1: Proposed Project Locations..... 4

LIST OF TABLES

Table 2.1-1: Installation Methods at Proposed Locations 7
Table 2.1-2: Special-Status Species Known to Occur or that Could Occur at Proposed Project
Locations..... 10
Table 4.1-1: Gaviota Tarplant Temporarily Affected.....32

ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
BMDs	Ballistic Missile Defense System
BMP	Best Management Practice
CA	California
CDFG	California Department of Fish and Game
CFR	Code of Federal Regulations
CZM	Coastal Zone Management
DOD	Department of Defense
EA	Environmental Assessment
ESA	Endangered Species Act
EO	Executive Order
FONSI	Finding of No Significant Impact
FR	Federal Register
GBI	Ground-Based Interceptor
GIS	Geographic Information System
GMD	Ground-Based Midcourse Defense
GPS	Global Positioning System
IDOC	Initial Defensive Operations Capability
INRMP	Integrated Natural Resources Management Plan
LDO	Limited Defensive Operations (formerly IDO)
LF	Launch Facility
MDA	Missile Defense Agency
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
RIDT	Relocatable In-Flight Interceptor Communication system Data Terminal
ROI	Region of Influence
SEA	Supplemental EA
SHPO	State Historic Preservation Officer
US	United States
USAF	United States Air Force
USFWS	US Fish and Wildlife Service

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1.0 PURPOSE OF AND NEED FOR ACTION

1.1 BACKGROUND

The Missile Defense Agency (MDA) is responsible for developing the Ballistic Missile Defense System (BMDS). Ground-Based Midcourse Defense (GMD) is a BMDS element that is designed to intercept long-range ballistic missiles before they reenter the Earth's atmosphere. In December 2002, the President directed the Department of Defense (DOD) to field test a set of initial missile defense capabilities beginning in 2004. In support of this directive, MDA established operational Ground-Based Interceptor (GBI) launch facilities at Vandenberg Air Force Base (AFB), California (CA), as part of an initial defense of the United States (US) from a limited ballistic missile attack. This included installation of communication cables between support facilities and missile silos. These activities were previously analyzed in the GMD *Initial Defensive Operations Capability (IDOC) at Vandenberg Air Force Base Environmental Assessment* (IDOC EA), (MDA, 2003b).

The proposed diverse communications system would be similar to the existing communication system that was previously analyzed in the IDOC EA in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, and its implementing regulations, 42 United States Code 4321 et seq. and 40 Code of Federal Regulations (CFR) 1500-1508; 32 CFR Part 651, *Environmental Analysis of Army Actions*; and 32 CFR Part 989, *Environmental Impact Analysis Process*. The IDOC EA described and summarized the environmental effects of the construction and operation of the communication system at Vandenberg AFB. As a result of continuing development of BMDS components, MDA proposes construction of a diverse communications system at Vandenberg AFB. This Supplemental Environmental Assessment (SEA) supplements the IDOC EA by analyzing the potential environmental impacts that might result from the construction and operation of the diverse communications system.

1.2 PURPOSE AND NEED

The purpose of MDA is to defend the United States and its allies against the threat of a limited strategic ballistic missile attack. The purpose of a diverse communications system at Vandenberg AFB would be to support the capability to launch defensive GBI missiles from Vandenberg AFB. The diverse communications system would provide redundancy to the current operational GMD communications system as well as physical separation between the two systems (diversity).

1.3 SUPPORTING ENVIRONMENTAL PLANS, PERMITS, AND CONSULTATIONS

In support of this SEA, a biological assessment was submitted to the US Fish and Wildlife (USFWS) as part of the consultation process (the USFWS response, dated June 20, 2008, is contained in Appendix A). Additionally, MDA worked with Vandenberg AFB Environmental Office (30 CES/CEV) archaeologists to minimize impacts to cultural resources. Consultation with the California State Historic Preservation Officer (SHPO) was completed on March 24, 2008 (Appendix B). The MDA determined the Proposed Action would not have an adverse effect on the coastal zone. The California Coastal Commission concurred with the Negative Declaration on May 28, 2008 (Appendix C). A Notice of Intent will be submitted to the State Water Resources Control Board for the National Pollutant Discharge Elimination System (NPDES) General Construction Storm Water Permit for this project. Contractors would be required to prepare and comply with a Stormwater Pollution Prevention Plan.

1.4 PUBLIC NOTIFICATION AND REVIEW

In accordance with the Council on Environmental Quality, DOD, US Army, and US Air Force (USAF) regulations for implementing NEPA, the MDA is soliciting comments on this SEA and the enclosed Draft Finding of No Significant Impact (FONSI) from interested and affected parties. A Notice of Availability for the SEA and Draft FONSI were published in the following CA newspapers:

- *Lompoc Record*
- *Santa Barbara News-Press*
- *Santa Maria Times*.

Copies of the SEA and Draft FONSI have been placed in local libraries and are available over the Internet at <http://www.mda.mil/mdalink/html/enviro.html>. Agencies, organizations, and libraries that received a copy of the SEA/Draft FONSI are listed in Chapter 8. The IDOC EA was also placed in the libraries and is available at the same Internet web site.

Following the 15-day public review period (as specified in the newspaper notices), the MDA would consider public and agency comments received to decide whether to (1) sign the FONSI, which would allow the Proposed Action to proceed; or (2) conduct additional environmental analysis (if needed).

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

Two actions are analyzed in this SEA—the Proposed Action and the No Action Alternative. Within this chapter, Section 2.1 describes the Proposed Action, including construction and operation of a diverse communications system. Section 2.2 describes the No Action Alternative. Alternatives to the Proposed Action that were considered and eliminated from further study are discussed in Section 2.3.

2.1 PROPOSED ACTION

MDA proposes construction of a diverse communications system at Vandenberg AFB. The project would use existing Vandenberg AFB communications infrastructure wherever possible. Along the routes identified for MDA diversity, there are six locations where existing communications infrastructure is either inadequate or unavailable for MDA use. The Proposed Action would install new communications lines, manholes (MH), and handholes (HH) at these six locations (see Figure 2.1-1), identified as:

- Launch Facility (LF) 21, LF 23, and LF 24 (Buildings 1962, 1964, and 1965)
- LF 02 and LF 03 (Buildings 1952 and 1972)
- El Rancho Road and the Relocatable In-Flight Interceptor Communication System Data Terminal (RIDT) (Building 1914)
- Bishop Road
- San Antonio Road West
- Cross Road and Building 1768

Avoidance and minimization measures for potential impacts on threatened, endangered, and other special-status species are included in the proposed project. These are discussed later in the chapter.

2.1.1 Installation Locations

The proposed communication lines would add redundancy and diverse capability to current lines. Each of the six locations and planned routes are described in more detail below.

2.1.1.1 LF 21, LF 23, and LF 24

LF 21, LF 23, and LF 24 are on the southwestern foothill slopes facing the Pacific Ocean, as shown in Figure 2.1-1. Communication lines are planned for installation between LF 24 and LF 23 and between LF 23 and LF 21. Along roadsides, communication lines would be installed within 10 feet of the paved road edge.

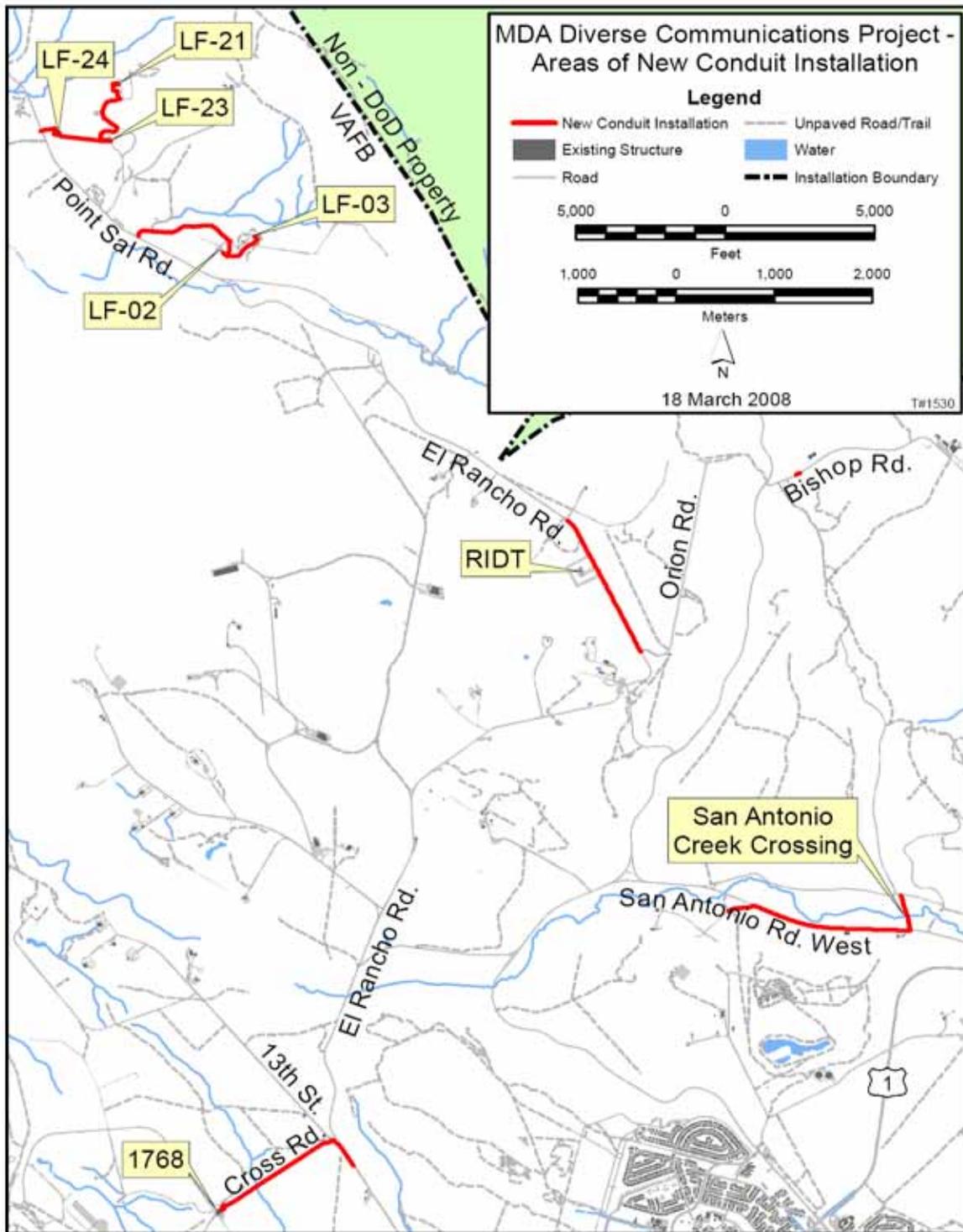


Figure 2.1-1: Proposed Project Locations

A total of approximately 7,480 feet of communication line would be installed by a combination of trenching and plowing without vibration. The communication line would be installed from the existing HH 1965A-A1 to LF 24, which is southwest of the intersection of Point Sal Road and the access road, to LF 24, Parquee Road. Approximately 1,300 feet of line would cross under Point Sal Road and continue along the northern edge of Parquee Road to new HH 1965 A1. Approximately 150 feet of communication line would exit HH 1965 A1, cross under Parquee Road, and tie into LF 24. The portion of communication line under the road would be concrete encased where it crosses an existing communications line. Approximately 137 feet of communication line is planned to exit existing HH 1965 and continue around the southern perimeter of LF 24 to proposed HH 1965 A2. From HH 1965 A2, approximately 1,550 feet of communication line would be installed uphill towards LF 23 to proposed MH 1964 A1. An additional 300 feet of communication line would tie MH 1964 A1 to LF 23. Approximately 1,000 feet of communication line would be installed from MH 1964 A1 north and along the northern border of LF 23 to planned HH 1964 A2. Approximately 2,140 feet of communication line will be laid from HH 1964 A2 west of Soldado Road, between the guard rail and Soldado Road. A concrete ditch that runs to the north and parallel to Soldado Road is located near the section of Soldado Road that runs east-west prior to the intersection with Tow Road. In this section, the communication line would be installed north of Soldado Road between the concrete drainage and Soldado Road to planned HH 1962 A1. Approximately 700 feet of communication line would be installed from HH 1962 A1 to HH 1962 A2. Approximately 200 feet of communication line would tie HH 1962 A2 to LF 21.

The staging area would be located near the northeast portion of the intersection of Globe Road and Point Sal Road.

2.1.1.2 LF 02 and LF 03

LF 02 and LF 03 are on the southwestern foothill slopes facing the Pacific Ocean (Figure 2.1-1). Communication line installation is planned along the southern portion of Taft Road and between LF 02 and LF 03.

A total of approximately 5,400 feet of communication line would be installed by a combination of trenching, boring, and plowing without vibration. HH 1991 B1 is proposed at the southwest corner of the intersection of Taft Road and Colt Road. Approximately 2,950 feet of communication line is planned from HH 1991 B1 within 10 feet of the southern edge of Taft Road to MH 1971 A1. Approximately 650 feet of communication line would be installed along an existing dirt road that runs from HH 1971 A1 to proposed MH 1971 A2. Approximately 75 feet of communication line would be installed from MH 1971 A2 to LF 02. Approximately 1,600 feet of communication line would be installed within an existing fire access road from MH 1971 A2 across Buff Road to planned HH 1972 A1. Approximately 125 feet of communication line would be installed from HH 1972 A1 to LF 03.

The staging area would also be located near the northeast portion of the intersection of Globe Road and Point Sal Road.

2.1.1.3 El Rancho Road and RIDT (Building 1914)

The existing RIDT (Building 1914) is located on the west side of El Rancho Road in what is commonly called Titan Pasture, as shown in Figure 2.1-1. Approximately 5,100 feet of communication line is proposed to be installed on the southwestern side of the road alongside the RIDT site by a combination of trenching and plowing without vibration. Installation would occur in the area between El Rancho Road and the existing pasture fenceline, in an area within 10 feet from the edge of El Rancho Road.

The start of communication line along El Rancho Road is proposed at HH 1987-1 near the intersection of El Rancho Road and Brioso Road. Approximately 1,846 feet of communication line is planned from this intersection to MH 1913 A. Approximately 646 feet of communication line would tie MH 1913 to HH 127 C2. Note that MH 1913 and MH 1913A are not being connected under this project. Approximately 2,585 feet of communication line is planned between HH 127 C2 and HH 127 C1.

The staging areas would be located at the intersection of Curly Road and Sun Road.

2.1.1.4 Bishop Road

At an area near the intersection of Grant Road and Bishop Road (Figure 2.1-1), a 215-foot section of communication line is planned for installation on the north side of Bishop Road. The communication line would be installed on the shoulder of the road, no more than 10 feet from the edge of Bishop Road. Approximately 215 feet of communication line is planned for installation by plowing, between HH 1905 D and MH 104 B.

Due to the small size of this project area, a construction staging area would not be needed.

2.1.1.5 San Antonio Road West

A communication line would be installed along the southern edge of Butt Road and San Antonio Road West and under San Antonio Creek (Figure 2.1-1). Along roadsides, the communication line would be installed within 10 feet of the existing road edge.

Approximately 7,510 feet of communication line would be installed by a combination of plowing and boring. Approximately 3,148 feet of communication line would be installed from MH 104 M to MH 104 K. Approximately 3,048 feet of communication line would be installed from MH 104 K to MH 104 J. The communication line would be installed by boring under San Antonio Road West at MH 104 J north under San Antonio Creek to MH 104 H located on the south side of Richmond Road, southeast of its intersection with Grant Road. This section is a linear distance of 1,315 feet.

The staging area would be located at existing MH 104 H and MH 104 J (to the south of San Antonio Road West).

2.1.1.6 Cross Road and Building 1768

The proposed route begins at the intersection of El Rancho Road, 13th Street, and Cross Road. In some areas, installation would occur between the northwestern edge of Cross Road and an existing guardrail, as shown in Figure 2.1-1.

Approximately 5,760 feet of communication line would be installed by a combination of plowing and trenching. Approximately 1,096 feet of communication line would be installed from HH 222 EP on southwestern side of 13th Street to the proposed HH 222 ER1 at the 3-way intersection. Approximately 24 feet of concrete encasement would be used where the proposed line crosses the existing line in this area. Approximately 2,236 feet of communication line would tie HH 222 ER1 to proposed HH 196 AB. The communication line would continue 2,236 feet from HH 196 AB to proposed HH 196 A1. Approximately 196 feet of concrete-encased communication line would tie HH 196 A1 to Building 1768. There would be some concrete encasement of the line as it enters HH196 A1 just outside the fence of Building 1768.

The staging area would be located east of Building 1768 in an existing paved parking lot.

2.1.2 INSTALLATION METHODS

Communication lines would be installed underground to a minimum depth of 24 inches and a maximum of 36 inches. To meet the redundancy and diversity requirements, new lines must be physically separated from existing lines by at least 12 feet. In areas where both lines must cross an existing line, the proposed line would be encased in concrete at their intersection. Methods of installation include plowing, plowing without vibration, trenching, and boring. Prior planning and coordination will ensure there is no service disruption in existing line providing MDA operations and test communications capability. Table 2.1-1 summarizes the methods that could be used at each of the six locations. Each method is described in detail below.

Table 2.1-1: Installation Methods at Proposed Locations

Location	Plowing	Plowing without Vibration	Trenching	Horizontal Directional Drilling (HDD) Boring
LF 21, LF 23, and LF 24		X	X	
LF 02 and LF 03		X	X	X
El Rancho Road and RIDT	X		X	
Bishop Road	X			
San Antonio Road West	X			X
Cross Road and Building 1768	X		X	

2.1.2.1 Plowing

Using a treaded, two-track vehicle, the conduit and subduct system would be simultaneously plowed into the ground at an angle of 30 degrees vertical with respect to grade. The plowing and placement of conduit is accomplished in a single operation. The initial slice into the ground is made by a 3- to 4-inch-wide rip plow attached to the two-track vehicle. Each track is approximately 2 feet wide. During plowing, the soil is removed temporarily within the slice and then replaced around the newly laid conduit. This soil would be unexcavated disturbed soil. The plow machine can reach a maximum depth of 36 inches. The soil is displaced temporarily by 4 inches (2 inches on each side of center) to accommodate a 4-inch conduit. The plow machinery requires a 10-foot wide open path during installation.

To reduce impacts to biological resources while plowing, the vibration mechanism on the plow machine would not be used. The vibration mechanism has the potential to bury seed. To minimize burying seed, the vibration mechanism would not be used in areas that are too large to remove the topsoil and set it aside for replacement.

2.1.2.2 Trenching

The trench machine loosens the soil, which is then stockpiled next to the trench. Once the trench is excavated, a crew places the conduit into the trench by hand. A skip loader follows the crew to replace the excavated soil. If a large number of rocks are excavated, then they would not be returned to the trench; sand or select fill is used instead to complete the backfill. The total width of the construction zone can be up to 30 feet.

An open cut and restore method would be used at road crossings where directional boring is not feasible, and in sections of the route where installing under the road itself would minimize potential adverse effects to biological and cultural resources. A rock wheel will cut a trench through the pavement and other

places and encases the rollpipe/conduit in a concrete slurry. The asphalt or concrete surface would be restored to original condition.

2.1.2.3 Horizontal Directional Drilling (HDD) Boring

HDD boring would be used where the proposed route encounters sensitive environmental areas (i.e., cultural resources and biological resources), to which trenching and plowing would have adverse effects. The proposed project would require boring operations at two locations, San Antonio Road West and Taft Road near LF 02, to protect cultural and biological resources.

A work area approximately 100 feet long by 50 feet wide would be required at the bore entry and exit points. Bore lengths can extend up to 2,000 feet and a maximum depth of 25 feet below grade. A surface-operated drilling device would be angled into the ground from the surface at the entry pit and directed to its destination using a radio-controlled mole that contains a cutter head. A truck-mounted diesel generator would be used to power the equipment at the drill site. Once the bore head is drilled to the destination location, the tunnel is reamed as required and conduit is placed.

During the boring process, bentonite fluid (a clay-water mix) is pumped through the borehole to lubricate the drill bit, carry drill cuttings to the surface, and prevent the bore tunnel from collapsing. The boring fluid is typically stored in tanks at the drill site when not in use. After the bore is completed, excess slurry remaining is removed from the site and either reused by the drilling contractor or disposed of at an appropriate facility.

Although it is not a common occurrence, fluid can escape the borehole through fissures or cracks in the soil and reach the ground surface. Bentonite is a natural sealant that does not contain chemicals, additives, or toxic substances. Every effort would be made to complete directional bores at depths so as to prevent bentonite releases. Best management practices (BMPs) would be implemented, as needed. These BMPs would include:

- Preparation of a frac-out contingency plan. A frac-out is the condition where drilling mud is released through fractured bedrock into the surrounding rock and sand, and travels toward the surface of the stream or river.
- Staging materials and equipment for spill cleanup
- Monitoring for frac-out

The contractor would provide a frac-out contingency plan to establish operational procedures and responsibilities for the prevention, containment, and clean-up of frac-outs associated with the proposed directional drilling project. The specific objectives of this plan are to:

- Minimize the potential for a frac-out associated with directional drilling activities;
- Provide for the timely detection of frac-outs;
- Protect the environmentally sensitive riverbed and associated riparian vegetation;
- Ensure an organized, timely, and “minimum-impact” response in the event of a frac-out and release of drilling bentonite; and
- Ensure that all appropriate notifications are made immediately to the California Department of Fish and Game and Regional Water Quality Control Board within 24 hours; and that required documentation is completed.

The following list identifies some materials and equipment to be maintained at the drilling site in sufficient quantities to ensure containment of any inadvertent releases of drilling fluid:

- Straw or hay bales (certified weed free)
- Stakes to secure bales

- Straw logs (wattles or fiber rolls)
- Silt fencing
- Sand bags
- Shovels
- Pumps with leak-free hoses

The following additional materials and equipment would be maintained at a nearby location in sufficient quantities to ensure containment of any inadvertent releases of drilling fluid:

- Light tower(s) available if necessary so that cleanup work could continue after dark.
- On-Call vacuum truck and agreement for an approved drilling fluid disposal site.
- Heavy equipment such as backhoes that may be utilized to control and clean up drilling fluid seepage.
- A sufficient pumping system would be in place to accommodate all drilling fluids at the bore entry and exit location to contain all drilling fluids within the bore entry and exit pits.

The contractor would be alert to factors indicating a possible frac-out, which include observed loss of drilling pressure, slow-down in the volume of returned drilling muds, or visual observation of drilling material extruding to the surface. In the event of a frac-out condition, drilling operations would stop and the released fluid would be contained. A non-toxic polymer or similar substance may be used to stop the leak, as appropriate. A biological monitor would also be present during these drilling operations. In the event of a frac-out, MDA would be required to notify the US Army Corps of Engineers and determine if a permit is required under Section 404 of the Clean Water Act. (US Army, 2008)

2.1.3 AVOIDANCE AND MINIMIZATION MEASURES

MDA coordinated with Vandenberg AFB during project development to avoid or minimize impacts to sensitive resources, both biological and cultural. Routes originally suggested were realigned to avoid biological resources. The proposed project reflects those changes by incorporating alternate routes, using alternate locations within existing routes, using alternate construction methods, and staging construction equipment in designated areas, to avoid sensitive resources or minimize adverse effects to sensitive resources. No realignments or minimization measures were necessary for cultural resources.

Table 2.1-2 summarizes the special-status species known to occur or that could occur in each of the six proposed project locations.

Table 2.1-2: Special-Status Species Known to Occur or that Could Occur at Proposed Project Locations

<i>Species</i>	<i>Status</i>	<i>LF 21, LF 23, LF 24</i>	<i>LF 02, LF 03</i>	<i>RIDT</i>	<i>Bishop Road</i>	<i>San Antonio Road West</i>	<i>Cross Road</i>
California red-legged frog	FT		X		X	X	
Coast horned lizard	CSC					X	
El Segundo blue butterfly	FE	X	X				X
Gaviota tarplant	FE, SE, 1B	X	X	X	X	X	X
Two-striped garter snake	CSC					X	
Unarmored threespine stickleback	FE, SE					X	
Vernal pool fairy shrimp*	FT						
Southwestern pond turtle	CSC					X	
Status Definitions: Endangered Species Act FE – Federally Endangered FT – Federally Threatened SE – State Endangered California Department of Fish and Game CSC – California Species of Special Concern California Native Plant Society 1B – Rare or endangered throughout its range * Vernal pool fairy shrimp—although none of the proposed six routes contain previously mapped vernal pool fairy shrimp habitat, measures to ensure that unmapped habitat is not impacted by the proposed project have been included							

2.1.3.1 California Red-legged Frog (*Rana aurora draytonii*)

Locations LF 02, LF 03, Bishop Road, and San Antonio Road West occur in proximity to known or potential California red-legged frog habitat. No equipment or personnel would cross or operate within surface waters. Therefore, no California red-legged frog larvae or breeding areas would be affected by this project. The following measures to avoid or minimize disturbances and adverse effects on California red-legged frogs would be implemented:

- No activities would occur in riparian habitat or ponds.
- Because project activities would occur outside of riparian habitat or ponds and during daylight hours, the chance of encountering adult California red-legged frogs is low. California red-legged frogs have mainly been observed in close association with streams, within about 300 feet of the densely vegetated riparian corridors (CRLF listing rule, 1996).
- Preconstruction surveys would be conducted in the vicinity of LF 02, LF 03, Bishop Road, and San Antonio Creek by a USFWS approved biologist one week prior to the start of project activities. If no frogs are found after the survey, construction fencing would be installed to prevent frogs from entering the construction area. Installation of the fencing would be monitored by a USFWS approved biologist.
- In the event that frogs are found during construction activities, work would be stopped.
- In the event that preconstruction surveys find adult California red-legged frogs within the project area, biologists authorized by the USFWS or with the appropriate USFWS permit would move the adult frogs outside the project area. Frogs would be relocated to a location similar to where it is normally encountered to reduce the risk of predation. Bulger *et al.* (2003) noted that migrating frogs were within 1650 feet of wetland habitat, and that these dispersing frogs were widely dispersed in space and time and not likely to warrant special protective measures as long as the breeding habitat and 330-foot buffer were preserved. After the frogs are relocated, a USFWS approved biologist would then monitor installation of fencing to delineate the project area.

- During relocation California red-legged frogs would not be harassed. Harass is defined by the USFWS 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. Since the projects would not be impacting wetland and riparian areas, the probability of encountering the species is low.
- Biological monitors would permanently remove any introduced non-native wildlife species found within California red-legged frog habitat that could predate adults, larvae, or egg masses. When practicable, invasive non-native plants in the project area shall be removed.

LF 02, LF 03

- California red-legged frog habitat was mapped northwest of the proposed route and in Shuman Creek. Indirect effects to the occupied habitat would be avoided by implementation of BMPs to avoid sedimentation. The use of BMPs would provide additional measures to protect water quality, such as the use of erosion control mats, straw wattles, and silt fencing throughout the project area.

Bishop Road

- California red-legged frog habitat has been mapped northeast of MH 104 B. Silt fencing would be installed in between the project area and wetland habitat to ensure no siltation occurs. A biologist would monitor the fence installation.
- Preconstruction surveys would be conducted to monitor California red-legged frogs.
- BMPs would be implemented during construction to avoid sedimentation. The use of BMPs would provide additional measures to protect water quality, such as the use of erosion control mats, straw wattles, and silt fencing throughout the project area.

San Antonio Road West

- The habitat surrounding San Antonio Creek was mapped as potential California red-legged frog habitat. No work would occur within the creek or associated riparian habitat. A bore machine would be used to bore beneath the creek to minimize impacts to habitat. Riparian habitat would be fenced prior to construction to minimize impacts. A biologist would monitor the installation of this fence and the placement of entrance and exit bore pits. The biologist would be present during boring under San Antonio Creek.
- A qualified biologist would conduct pre-construction surveys each day throughout the duration of the project and would monitor the installation of fencing around riparian habitat at the project area. The surveys would document the presence of the California red-legged frog adults, larvae, or eggs within the project area. The 30th Space Wing Commander or the Commander's designee, in coordination with the corresponding contracting officer, would have the authority to stop the project if California red-legged frogs are found within the project area that could be harmed.

2.1.3.2 Coast Horned Lizard (*Phrynosoma coronatum frontale*)

The coast horned lizard was previously found in upland habitat near San Antonio Creek. The following measures to avoid or minimize disturbances and adverse effects on coast horned lizards would be implemented:

San Antonio Road West

- Biological training for special-status species would be given to construction crews before the start of work and as needed throughout construction. Handouts that include photos of special-status species that could occur in the project area would be provided.
- A qualified biologist would survey the project area for coast horned lizards prior to the start of any ground disturbing activities. If individuals are found, they would be relocated to a location outside and downstream of the project area. The biologist would hold a valid scientific collecting permit from the California Department of Fish and Game (CDFG) that allows for relocation of the species.

2.1.3.3 El Segundo Blue Butterfly (*Euphilotes battoides allyni*)

All of the project areas are located outside the known occupied habitat of the El Segundo blue butterfly based upon 2007 flight survey data.

Additional seacliff buckwheat—host plant to the El Segundo blue butterfly—may germinate prior to installation of the communication line. These new plants would not have gone through a bloom cycle between the time of this SEA preparation and Proposed Action construction. Therefore, these plants would not be sufficient to support El Segundo blue butterfly larvae. Thus, any new plants that germinate between the SEA preparation and construction may be disturbed during construction.

The following measures to avoid or minimize disturbances and adverse effects on El Segundo blue butterflies would be implemented:

- Work would be scheduled in areas furthest from coast buckwheat plants first and then work would be scheduled in areas that contain coast buckwheat plants near the end of the flight season (1 June to 15 September), to the extent practicable. If portions of the project occur during the flight season, then the project proponent would call the Vandenberg Environmental Office (30 CES/CEVNN) to determine whether the known occupied habitat has changed based on additional data collected.
- Throughout the project, the contractors would be required to comply with the California State Water Resources Control Board NPDES General Permit for Storm Water Discharges Associated with Construction Activity, including erosion and dust control requirements. Per the IDOC EA Air Quality sections, standard dust reduction measures would be implemented, such as water truck use and covering of any stockpiled materials. To the extent feasible, road maintenance and repair activities associated with trenching activities in areas near coastal buckwheat plants would be scheduled for winter (i.e. wetter) months, although dust control measures would be a standard requirement throughout the project.
- During the flight season of the El Segundo blue butterfly all vehicles and equipment working near areas with seacliff buckwheat would travel at a maximum speed of 5 miles per hour.

LF 21, LF 23, LF 24

- In the area between Soldado Road and LF 21, several individuals of the seacliff buckwheat are present. Installation of the communication line would occur along the northern edge of Soldado Road between the edge of the road and the concrete ditch to avoid impacts. The communication line would be installed parallel to Tow Road to avoid seacliff buckwheat. A qualified biologist would monitor the installation of protective barriers in locations where construction equipment and/or personnel would be situated adjacent to or in the near vicinity of seacliff buckwheat.

LF 02, LF 03

- Seacliff buckwheat is present within a 150-foot section along Taft Road. The communication line would be installed by boring under the seacliff buckwheat. A 2-foot buffer (in all directions including the root zone) around the seacliff buckwheat species would be maintained to avoid impacts. A qualified biologist would monitor the installation of construction fencing in locations where construction equipment and/or personnel would be situated adjacent to or in the near vicinity of seacliff buckwheat.

Cross Road and Building 1768

- There is one seacliff buckwheat individual present near the Cross Road communication line installation route. The seacliff buckwheat species is northwest of the guardrail and is not anticipated to be impacted by installation of the communication line. The seacliff buckwheat species would be flagged prior to ground disturbance by a biologist to avoid impacts.

2.1.3.4 Gaviota Tarplant (*Deinandra increscens* subspecies *villosa*)

Potential Gaviota tarplant habitat exists within all six of the proposed locations. The following measures would be implemented to reduce impacts to the species:

- The area of disturbance would be minimized.
- Off-road parking areas would be mapped and construction personnel would be informed of these designated areas.
- When feasible, installation in non-developed areas where Gaviota tarplant occurs and where vegetation would be cleared, conduit and cable would be installed after seed has set (30 October to 1 February) and outside the rainy season (January and February). Biological monitors would verify when the area has gone to seed and the project contractor would be informed of the optimal period to work. The cable would be laid as quickly as possible to reduce soil disturbance.
- Total habitat disturbances would be quantified through pre- and post-construction surveys.

LF 21, LF 23, LF 24

- From Point Sal Road to LF 24, the communication line would be installed roadside (along the northern edge of the road). The plow machine would be used. If tarplant cannot be avoided, the top 3 inches of soil within areas of ground disturbance would be scraped and set aside for replacement. Replacement of scraped topsoil would be done within 1 week of the scraping.
- Tarplant along the northern edge of the access road to LF 24 would be flagged and avoided during construction. Tarplant within the area between LF 24 and LF 23 would be flagged and avoided during installation. The communication line would be installed using the plow machine with vibration. If tarplant cannot be avoided, the top 3 inches of soil within areas of ground disturbance and tarplant would be scraped and set aside for replacement. Replacement of scraped topsoil would be done within 1 week of the scraping.
- Tarplant is present between Soldado Road and LF 21. Installation would occur along the northern edge of Soldado Road between the edge of the road and the concrete ditch to avoid impacts. The communication line would be installed using the plow machine without the vibration mechanism in this section. Tarplant in this area would be flagged and avoided when

feasible. If tarplant cannot be avoided, the top 3 inches of soil within areas of ground disturbance and tarplant would be scraped and set aside for replacement. Replacement of scraped topsoil would be done within 1 week of the scraping.

LF 02, LF 03

- In the area south of Taft Road, the communication line would be installed roadside, between the edge of the road and fenceline (up to 10 feet from edge of road). The plow machine with vibration would be used. The top 3 inches of soil within areas of ground disturbance would be scraped and set aside for replacement. Replacement of scraped topsoil would be done within 1 week of the scraping.
- Tarplant is present along the route planned between LF 02 and a fence that occurs prior to Buff Road. The communication line would be installed within an existing fireroad in this area. The fireroad is regularly maintained and is a disturbed area. The plow machine would be used. The top 3 inches of soil within areas that contain tarplant would be scraped and set aside for replacement. Replacement of scraped topsoil would be done within 1 week of the scraping.
- From a fence to Buff Road is open space habitat that contains tarplant habitat. The plow machine would be used without the vibration mechanism in this area to avoid burying tarplant seeds in this open space habitat.

El Rancho Road and RIDT

- Tarplant is present along the El Rancho Road communication line route. The plow machine with vibration would be used.
- Trenching would occur only in areas where Gaviota tarplant is absent.

Bishop Road

- Tarplant is present in two locations near the planned communication line. These two areas of tarplant would be fenced prior to ground-disturbing activities to ensure avoidance of impacts. A biologist familiar with the Gaviota tarplant would monitor installation of the fence.

San Antonio Road West

- Tarplant is present in areas along San Antonio Road West. The plow machine with vibration would be used in this area. The top 3 inches of soil in the roadside areas of the route where tarplant occurs would be scraped and set aside for replacement. Replacement of scraped topsoil would be done within 1 week of the scraping.

Cross Road and Building 1768

- Tarplant is present in areas along the proposed Cross Road route. A plow machine with vibration would be used for installation of the communication line in roadside areas. The top 3 inches of soil within roadside areas where tarplant is present would be scraped and set aside for replacement. Replacement of scraped topsoil would be done within 1 week of the scraping..

2.1.3.5 Two-striped Garter Snake (*Thamnophis hammondi*)

The two-striped garter snake was previously found in San Antonio Creek. No work would occur within the creek. A bore machine would be used to bore beneath the creek to minimize impacts to the Creek and riparian habitat. No direct impacts to the Creek or riparian habitat would be generated. Adverse effects to two-striped garter snakes and their habitat would be avoided whenever possible. The following measures to avoid or minimize disturbances and adverse effects on two-striped garter snakes would be implemented:

San Antonio Road West

- A qualified biologist would survey the project area for two-striped garter snakes prior to the start of ground disturbing activities. If individuals are found, they would be relocated outside and downstream of the project area. The biologist would hold a valid scientific collecting permit from the CDFG that allows for relocation of the species.

2.1.3.6 Unarmored Threespine Stickleback (*Gasterosteus aculeatus williamsoni*)

The unarmored threespine stickleback was previously found in San Antonio Creek. No work would be done within the creek. A bore machine would be used to bore beneath the creek to minimize impacts to the creek and riparian habitat. No direct impacts to the creek or riparian habitat would occur. Adverse effects to unarmored threespine sticklebacks and their habitat would be avoided whenever feasible. The following measures to avoid or minimize disturbances and adverse effects on unarmored threespine sticklebacks would be implemented:

San Antonio Road West

- Erosion control BMPs would be implemented during boring near the San Antonio Creek riparian corridor.
- Biological monitors would be required during all boring activities under San Antonio Creek.
- Project equipment maintenance and refueling would be conducted at least 500 feet away from riparian habitats and wetlands in designated areas approved by 30 CES/CEV. Secondary spill containment would be used during all maintenance and refueling operations.
- A spill containment kit would be kept on the premises if equipment is present within 200 feet of stream or pond habitat.
- Debris and other project spoils would be removed from the site and disposed of according to Air Force and Vandenberg AFB regulations.
- A contingency plan would be implemented in the event of a frac-out within San Antonio Creek.

2.1.3.7 Southwestern Pond Turtle (*Emys marmorata pallida*)

The southwestern pond turtle has been previously found in San Antonio Creek. No work would occur within the creek. A bore machine would be used to bore beneath the creek to minimize impacts to the creek and riparian habitat. No direct impacts to the creek or riparian habitat would occur. Adverse effects to southwestern pond turtles and their habitat would be avoided whenever possible. The following measures to avoid or minimize disturbances and adverse effects on southwestern pond turtles would be implemented:

San Antonio Road West

- A qualified biologist would survey the project area for southwestern pond turtles prior to the start of ground disturbing activities. If individuals are found, then they would be relocated outside and downstream of the project area. The biologist would hold a valid scientific collecting permit from the CDFG that allows for relocation of the species.

2.1.3.8 Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)

The Bishop Road project occurs in an area that was determined unsuitable for vernal pool fairy shrimp habitat. None of the six locations contain potential vernal pool fairy shrimp habitat. Therefore, this species would not be affected by the proposed MDA projects. The following measure to avoid or minimize disturbances and adverse effects on vernal pool fairy shrimp habitat would be implemented:

- Prior to construction, biological monitors would walk the project routes to ensure that no previously unmapped vernal pools occur in the proposed routes.

2.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, the MDA would not install a diverse communications system at VAFB. MDA would continue to use the existing communication system in its existing configuration.

2.3 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

Various alternatives were considered for different segments of the diverse communications project. One alternative was to place a segment in conduit on the cable bridge over San Antonio Creek, but MDA policy is to place operational communications lines underground. Another alternative was to use the abandoned existing power underground conduit on the south side of Cross Road for a run of approximately 2,000 feet, but this alternative was rejected because of the proximity to the existing mission communication cable and the difficulty of accessing the MHs at each end of the abandoned run. Various short segments at LF 21, LF 02, and LF 03 were rejected because of the underground conflicts with existing communication and electrical power lines. The alternative to use the El Rancho Bridge for a route was rejected because the San Antonio Road West route provided better diversity.

3.0 AFFECTED ENVIRONMENT

This chapter describes the environmental characteristics that may be affected by the Proposed Action. The activities associated with the diverse communications project could have an effect on biological resources (specifically special-status species), cultural resources, and coastal zone management at Vandenberg AFB. These resource areas are summarized in the sections below.

Impacts to other environmental resources at Vandenberg AFB would be similar to those discussed in the IDOC EA (MDA, 2003b). These resources are summarized in the following paragraphs and are not analyzed further in this SEA because the impacts do not differ from those identified in the IDOC EA for the initial communications cable installation.

Air Quality

The Proposed Action is not anticipated to impact the regional air quality. Emissions from conduit, HH, and MH installation would be regulated in accordance with the Memorandum of Agreement between Vandenberg AFB and the Santa Barbara County Air Pollution Control District. No exceedance of air quality standards or health-based standards of non-criteria pollutants would be anticipated during conduit, HH, and MH installation. The review of the Proposed Action as required by the General Conformity Rule resulted in a finding of presumed conformity.

On January 24, 2007, President Bush issued Executive Order (EO) 13423, Strengthening Federal Environmental, Energy, and Transportation Management. One of the main requirements established under this EO is the reduction of greenhouse gases through a reduction in energy intensity of 3 percent per year or 30 percent by the end of fiscal year 2015. Given the requirements of EO 13423, and the increasing concerns that greenhouse gases contribute to Global Climate Change, the MDA will 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 VAFB.

Airspace

The activities proposed would not result in short- or long-term impacts to airspace. No new special use airspace, or any modification to existing special use airspace, would be required to support the Proposed Action.

Environmental Justice

No environmental justice issues have been identified at Vandenberg AFB.

Geology and Soils

A Stormwater Pollution Prevention Plan would be developed for the site in coordination with 30 SW to satisfy the requirements of the NPDES. BMPs would be used for erosion and sediment control. The Vandenberg AFB *Spill Prevention Control and Countermeasure Plan* (30 SW Plan 32- 4002C) would provide resources and guidelines for use in the control, cleanup, and emergency response for spills of hazardous material or waste. This Plan also would provide measures to prevent soil erosion. In the event that the release of hazardous material or waste would occur, affected areas would be treated in accordance with applicable federal, state, and local regulations.

Hazardous Materials and Hazardous Waste

Hazardous materials use at Vandenberg AFB must conform to applicable federal, state, and local laws and regulations. On Vandenberg AFB, Air Force organizations are required to manage hazardous

materials through base's HazMart Pharmacy. The HazMart is the single point of control and accountability for the requisitioning, receipt, distribution, issue, and reissue of hazardous materials. Hazardous materials obtained from off base suppliers are also coordinated through Vandenberg AFB's HazMart Pharmacy. Hazardous materials are inventoried and tracked using Environmental Management System software. These procedures are in accordance with the 30 SW *Hazardous Materials Management Plan*. In the unlikely event a spill or release occurs, the use of procedures outlined in the Vandenberg AFB *Spill Prevention Control and Countermeasures Plan* (30 SW Plan 32-4002C) and *Hazardous Materials Emergency Response Plan* (30 SW Plan 32-4002A) would ensure that the potential impact would be minimal.

For hazardous waste, the base Hazardous Waste Management Plan (30 SW Plan 32-7043-A) describes the procedures for packaging, handling, transporting, and disposing of such wastes. If not reused or recycled, hazardous wastes are transported off base for appropriate treatment and disposal.

Health and Safety

Installation activities would comply with Occupational Safety and Health Administration (OSHA), USAF safety and health regulations, the US Army Corps of Engineers Safety and Health Requirements Manual (EM 385-1-1), Range Safety requirements and other recognized standards for operations that involve construction or facility modifications as applicable.

Infrastructure

USAF approval for work at the project sites would be requested and received prior to any construction or road excavation. These permits require the notification and approval of the Utilities Shop, the Communication Squadron, and the Explosive Ordnance Disposal Flight to avoid impacting existing utilities, telephone cables, and fiber optic lines, or unexpected encounters with explosive ordnance. The Electrical Division would be consulted for the identification and location flagging of underground electric lines on site. MDA would also be consulted for identification and flagging of critical infrastructure supporting MDA operations and test activities.

Transportation procedures would comply with Federal Aviation Administration, Department of Transportation, OSHA, and applicable USAF safety regulations. These procedures would minimize the potential for accidents, as well as provide the means to mitigate potential adverse effects should an accident occur. These limited events would not have a substantial impact on existing transportation patterns or volume on or off base. Construction and operational activities would have no long-term adverse impact on transportation on Vandenberg AFB and would have no impact to off base transportation.

Land Use

Numerous communities are located less than 10 miles from the base, but are separated by wide buffers of agricultural areas. The county's predominant land uses are agriculture and natural forest. A Federal Correctional Institution is adjacent to Vandenberg Village and along the eastern base boundary.

Approximately 33 percent of the base has been disturbed, leaving the remainder in its natural state. The installation is bounded on the west by 35 miles of Pacific Ocean coastline, and occupies approximately 6 percent of the county's total land area. The composition of base land uses consists of residential, commercial, industrial, service, and administrative activities, requiring 520 miles of roads, 17 miles of railroad tracks, and approximately 1,000 buildings.

A base land management plan has been developed to document and classify various land use types to establish and maintain Vandenberg AFB's natural resources and serve as a guide for multiple-use/sustained-yield management. In addition to these guidelines, various USAF safety regulations, such

as the Range Safety Requirements, EWR 127-1, and the Vandenberg AFB Comprehensive Plan, restrict on-base development, as do several state and federal regulations designed to preserve cultural, historical, and environmental integrity.

The installation is divided into northern and southern regions by the Santa Ynez River and West Ocean Avenue. Most development is on North Vandenberg AFB and consists primarily of administrative, industrial, and residential facilities. Launch complexes include the former facilities for Peacekeeper and Minuteman intercontinental ballistic missiles. North Vandenberg also plays host to launch silos and facilities supporting the MDA operational and test mission. Land use in the area adjacent to the northern boundary of the base is predominantly dedicated to grazing of livestock.

Vandenberg AFB's 35 miles of undeveloped coastline exist as a fraction of the 840-mile-long California Coastal National Monument composed of small, federally owned islands, rocks, and exposed reefs.

Noise

Noise from construction would comply with the Occupational Safety and Health Act, the USAF Occupational Safety and Health regulations, the US Army Corps of Engineers Safety and Health Requirements Manual (EM 385-1-1), Range Safety requirements, and other recognized standards for operations that involve construction or facility modifications. The proposed sites are within the boundaries of Vandenberg AFB, which eliminates concerns about noise exposure to the local public outside the base. A health and safety plan, requiring the use of hearing protection when appropriate, would be prepared by the contractor and submitted to the base to ensure the health and safety of onsite workers.

Construction noise and the increased presence of personnel could affect special-status species within the area. Construction ground disturbance and equipment noise-related impacts could include loss of habitat, displacement of wildlife, and short-term disruption of daily/seasonal behavior. While some wildlife may potentially leave the immediate area permanently, others may likely become accustomed to the increased noise and human presence. Construction activities may temporarily disturb wildlife in the immediate area, however, the activities would be limited in duration, and no direct physical auditory changes in wildlife are anticipated.

Socioeconomics

Construction of the diverse communications lines would not cause displacement of populations, residences, or businesses within Santa Barbara County. By spending money in the local economy, mainly via accommodation and procurement of goods and services, the additional personnel would represent both a potential increase in local service-based employment opportunities and a small but positive temporary economic impact to the local community. The overall impact would, however, be slight and would not lead to population growth.

Water Resources

Construction of the diverse communications lines would follow spill prevention, containment, and control measures, and thus, would minimize potential impacts to surface water.

Because the cumulative area disturbed by the Proposed Action would be greater than 0.4 hectare (1 acre), a NPDES General Permit for Storm Water Discharges Associated with Construction Activity would apply. MDA would submit a Notice of Intent to comply with this State General Permit for construction activities to the State Water Quality Control Board. A Stormwater Pollution Prevention Plan would be developed by the contractor in coordination with 30 SW and submitted for review to 30 CES/CEVC to

satisfy the requirements of the NPDES. During construction activities, stormwater BMPs would be implemented during and after construction.

3.1 BIOLOGICAL RESOURCES

The region of influence (ROI) for biological resources includes the area around the six project segments that are widely scattered over north Vandenberg AFB.

3.1.1 SPECIAL-STATUS SPECIES

Special-status species include federal and state threatened and endangered species, as well as CDFG Species of Special Concern. To determine which special-status species could occur within the project area, biological resource geographic information system (GIS) data layers were collected from the Vandenberg AFB GeoBase Integration Office. Data layers included mapping data for California red-legged frog, coast horned lizard, El Segundo blue butterfly, seacliff buckwheat, Gaviota tarplant, two-striped garter snake, unarmored threespine stickleback, vernal pool fairy shrimp, and southwestern pond turtle. The Proposed Action is not located in wetlands.

Due to the lack of tarplant data along some portions of the proposed routes, new field surveys were conducted on 24 and 25 October 2007. Biologists surveyed proposed communication line routes for the presence of tarplant. The tarplant peak flowering period occurs between early June and mid-August, but flowering may occur into September or October depending on environmental conditions.

A site on Vandenberg AFB that contains a known population of tarplant was visited prior to the surveys, to verify that tarplant was aboveground and visible on 24 and 25 October 2007. During the time the surveys were conducted, tarplant was visible and identifiable. However, it was not identifiable to the subspecies level (Gaviota tarplant versus grassland tarplant).

Visual surveys were conducted at all six proposed new diverse communications lines locations. A global positioning system (GPS) unit was used to record all tarplant occurrences near the proposed installation areas to a minimum one-foot accuracy. Tarplant data was uploaded to GIS and added to the proposed communication line route maps. Routes were modified to avoid and/or reduce impacts to biological resources where feasible.

A seacliff buckwheat survey was conducted 20 November 2007. Seacliff buckwheat occurrences were logged using a GPS unit to a minimum of one foot accuracy. GIS was used to overlay the areas of seacliff buckwheat occurrence onto the proposed routes. Communication line routes were modified to avoid/reduce impacts to seacliff buckwheat where feasible.

Previous surveys and reports at Vandenberg AFB were also reviewed to compile the species status information described below. The *Draft Integrated Natural Resources Management Plan* (INRMP) (Tetra Tech 2006), *Threatened and Endangered Species Management Plan* (SRS Technologies 2006a), and *Fish and Wildlife Management Plan* (SRS Technologies 2006b) were reviewed to gather information on special-status species at Vandenberg AFB.

California Red-legged Frog

The California red-legged frog was listed as federally threatened on 20 May 1996 (61 FR 25813). The USFWS designated critical habitat for California red-legged frogs on 13 March 2001 (66 FR 14626) and then redesignated critical habitat on 13 April 2006 (50 FR 19244). During this redesignation, the amount of critical habitat for the species was reduced from 4.1 million acres to approximately 450,000 acres.

Vandenberg AFB was excluded from this designation under 4(a)(3) of the Endangered Species Act (ESA) which states that the Department of Defense lands can be excluded from critical habitat designation if the site's INRMP provides a benefit to the species. Because Vandenberg AFB has a Draft INRMP that contains conservation measures for the California red-legged frog and its habitat, critical habitat was not designated within Vandenberg AFB. Critical habitat for the California red-legged frog is presently under review by the USFWS because questions have been raised about the scientific information used and whether the decision to reduce the amount of critical habitat was consistent with the appropriate legal standards. Upon completion of this review, Vandenberg AFB may have designated critical habitat if protection measures are not properly implemented. Currently, the proposed projects are not within critical habitat for this species. The proposed project contains avoidance and minimization measures to protect the primary constituent elements of critical habitat.

Under the Sikes Act Improvement Amendments of 1997 (16 USC. 670 *et seq.*), the Secretary of Defense is directed to "carry out a program to provide for the conservation and rehabilitation of natural resources on military installations." AFI 32-7064, Section 2.1 directs that "Based on an interdisciplinary approach to ecosystem management, the INRMP ensures the successful accomplishment of the military mission by integrating all aspects of natural resources management with each other and the rest of the installation's mission."

The Draft INRMP for Vandenberg AFB protects essential habitat by these conservation measures:

- Avoiding California red-legged frogs and their habitat, whenever possible, in project planning
- Scheduling activities that may affect California red-legged frogs outside of the peak breeding period (December-March)
- Coordinating with Vandenberg AFB water quality staff to prevent degradation and contamination of aquatic habitats
- Prohibiting the introduction of non-native fishes into streams on-base

Additional measures for protection of California red-legged frogs are provided by excluding cattle from wetlands and riparian areas through the installation and maintenance of fencing. The Draft INRMP specifies periodic monitoring of the distribution and abundance of California red-legged frog populations on the base, and periodic surveys to provide continuous evaluations of the subspecies' status at known and new sites identified on the base.

California red-legged frogs breed from November to April, usually laying egg masses during or shortly following large rainfall events from late December to mid- to late April. California red-legged frogs require aquatic habitat for breeding and cover, but they 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 refugia for dispersing frogs. California red-legged frogs often disperse from their breeding habitat as water levels fall below approximately 3 feet, finding cover in upland areas under brush or duff to retain moisture. 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 2 miles from breeding habitat (Bulger *et al.* 2003).

California red-legged frogs occur in nearly all permanent streams and ponds on Vandenberg AFB. They have been documented in scattered locations along San Antonio Creek, Cañada Honda Lagoon, Jalama Creek, and Santa Ynez River, and were observed in high numbers in the dune swale wetlands on San Antonio Terrace, particularly at two wetland sites created in 1991 (Christopher 2002).

Coast Horned Lizard

The coast horned lizard is listed as a California Species of Concern by the CDFG. This species is found in areas with abundant, open vegetation such as riparian scrub, coastal sage scrub, coastal dune scrub, open chaparral, and annual grassland, with loose, sandy soils and open shrub canopy. Coast horned lizards have been documented in chaparral and scrub near Pine Lakes and 13th Street on North Vandenberg AFB (Christopher 1996). This species is active above ground April through October. The reproductive season for this species varies from year to year and geographically depending on local conditions, but has been reported mostly from May through June.

The coast horned lizard has disappeared from much of its range in California. Habitat fragmentation, development, introduction of non-native plants and animals, and alteration of fire regimes has significantly impacted this species. The invasion of exotic plants can degrade habitat and alter the arthropod prey base (primarily native harvester ants) that this species requires. The introduction of nonnative ant species can also lead to a significant reduction in suitable prey (SRS Technologies 2006b)

El Segundo Blue Butterfly

The El Segundo blue butterfly was listed as federally endangered under the ESA on 1 June 1976 (41 FR 22041). Critical habitat for this species was proposed on 8 February 1977 (42 FR 7972). At the time of publication of critical habitat, this species was not known to occur on Vandenberg AFB. A Final Recovery Plan was published in 1998 (USFWS 1998).

A member of the family Lycaenidae, this butterfly is one of five species of *Eupholites battoides*—the square spotted butterflies. This butterfly is endemic to coastal sand dunes that support suitable conditions for the early life stages, larval food plants, adult nectar sources, and adult feeding, perching, and courtship areas. While the primary factor limiting El Segundo blue butterfly populations is the occurrence of its host plant, seacliff buckwheat, its presence is not always indicative of the occurrence of this butterfly. The distribution of seacliff buckwheat is much more extensive than that of the butterfly (Hickman 1993). Age class distribution and density of host plant patches are important to successful colonization and maintenance of butterfly colonies (USFWS 1984).

El Segundo blue butterfly emerge during summer with the opening of the flowers of seacliff buckwheat, which is used for larval food, adult nectaring, mate location, copulation, and oviposition. The host plant also provides a layer of litter beneath the plant where pupation typically occurs. The adult life of these butterflies is relatively short—only a few days between 1 June and 14 September, during which time they mate and lay eggs (Arnold 1983). The eggs hatch within a week or so of their deposition. The larvae feed on the flower heads of the host plant for approximately 1 month before they enter the pupal stage (Mattoni 1992).

Population fluctuations are not unusual among insects, especially those that have a single generation per year, such as the El Segundo blue butterfly. Factors such as seasonal weather conditions, increased parasitism and predation, a higher incidence of disease, or a decline in food plant or flowerhead numbers, may individually or collectively affect population numbers. The El Segundo blue butterfly is a relatively sedentary non-migratory species. Adults may disperse as few as 100 feet during their entire lifetimes, and movement is generally restricted to the immediate vicinity of host plants (Arnold 1983).

El Segundo blue butterfly was thought to occur exclusively at the El Segundo Dunes in Los Angeles County until their potential discovery on Vandenberg AFB during the course of terrestrial arthropod surveys in 2004-2005 (Pratt 2006). Pratt (2006) raised the question of whether the Vandenberg AFB population is the same species that is found at the El Segundo Dunes or if it is actually a unique taxon. Molecular studies are being conducted at the University of California, Riverside to determine the relationship of the Vandenberg AFB butterflies to other members of the *Euphilotes* complex. Results are due in June 2008; however it is possible the results will be inconclusive.

3000 acres were surveyed on Vandenberg AFB during the summer of 2007; and 167 adults were documented (Mantech et al 2007). Results from these surveys showed that the populations of the El Segundo blue butterfly on Vandenberg AFB were concentrated in two distinct areas. Based upon the results from these surveys, Vandenberg AFB considers approximately 17,470 acres to be occupied by the butterfly. This was determined by buffering the known El Segundo blue butterfly localities by 1 mile, which is the approximate maximum dispersal distance of the subspecies (USFWS 2008a).

Gaviota Tarplant

Two species of tarplant occur at Vandenberg AFB: the Gaviota tarplant (*Deinandra increscens* subspecies *villosa*) and the grassland tarplant (*Deinandra increscens* subspecies *increscens*). The Gaviota tarplant was listed as federally endangered under the ESA on 20 March 2000 (65 FR 14888) and as state-endangered by the California Fish and Game Commission in January 1990 (California Code of Regulations, Title 14, Section 670.2). Critical habitat for this species was designated on 7 November 2002 (67 FR 67968). However, Vandenberg AFB was excluded from this designation under section 4(b)(2) of the ESA. As a result, the proposed project is not in critical habitat. The grassland tarplant is not a listed species.

Tarplants are typically low growing, spreading annuals (1 to 3 feet in height) with a grayish-green cast due to the variable villous pubescence on leaves, upper stems, and flowering heads. The yellow flowering heads have a typically open paniculate to densely corymbose capitulescence. The number of ray and disc florets varies in number within flowering heads. Ray floret number varies between 8 and 13, but most commonly will possess 10 to 13 florets. Disc floret number varies between 13 and 31, but typically heads will possess 13 to 18. Field biologists have often used floret number as a principal feature to aid in distinguishing between Gaviota tarplant and grassland tarplant. It has become increasingly clear that floret number is more variable than when the subspecies was first described from a single population and several herbarium specimens.

Tarplant seeds germinate following winter rains. Peak flowering occurs between early June and mid-August, but flowering may occur into September or October depending on environmental conditions.

Populations occur in mildly disturbed areas within coastal grassland communities. Less commonly, Gaviota tarplants occur in broad grassy areas within coastal sage scrub associations.

Competitive species that respond to large amounts of disturbance tend to germinate rapidly and establish dense populations tend to displace Gaviota tarplants. Areas of high disturbance are typically devoid of Gaviota tarplants even when the soil profile is conducive to germination and establishment.

Two-striped Garter Snake

The two-striped garter snake is considered a species of special concern by the CDFG. The species is semi-aquatic and is typically found in permanent and intermittent rivers and creeks in a variety of habitats

(scrub, chaparral, oak-woodlands, and riparian woodland). Previous field surveys were conducted to determine the occurrence of this species on Vandenberg AFB (Christopher 1995, 1996). The species is known to occur in San Antonio Creek, Cañada Honda, and Jalama Creeks at Vandenberg AFB, however, it may be more widespread (SRS Technologies 2006b).

The two-striped garter snake has disappeared from numerous localities in southern and central California. Much of its habitat has been lost due to modification, predation by introduced fish, bullfrogs, and feral pigs, and a loss of prey food base, particularly amphibians and fish.

Unarmored Threespine Stickleback

The unarmored threespine stickleback was listed as federally endangered under the ESA on 13 October 1970 (35 FR 160478) and as state endangered by the CFGD in June of 1970 (California Code of Regulations, Title 14, Section 670.2). Critical habitat for this species was proposed in 1980 but a final rule was never published. A Recovery Plan was published in 1985.

The unarmored threespine stickleback is a small, scaleless, freshwater fish that occurs in slow moving waters of streams and rivers. Historically, this species was found throughout southern California. By 1985 it only remained in a small portion of the upper Santa Clara River drainage in Los Angeles County and the San Antonio Creek drainage in Santa Barbara County. This species requires slow water flow with low turbidity as well as aquatic vegetation for cover and nest material. It is sensitive to excessive sedimentation and the loss of habitat through changes in water flow, water level, and the growth of emergent plants. Main threats to the species include urban development, pollution, mining, predation by non-native species, water quality degradation, and channelization of streams.

At Vandenberg AFB the unarmored threespine stickleback occurs in San Antonio Creek and possibly in Cañada Honda Creek. The population in Cañada Honda Creek was transplanted successfully from San Antonio Creek in the mid-1980s. However, no individuals have been documented in Cañada Honda Creek in the last 10 years (SRS Technologies 2006b).

A special-status fish survey was conducted in San Antonio Creek at the crossing of El Rancho Road (Tetra Tech 2000). The study showed that unarmored threespine sticklebacks were abundant in the 1.2 miles above and below El Rancho Road and in San Antonio Creek. This survey was conducted approximately 2.5 miles downstream of the proposed construction area.

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp was listed as federally threatened on 19 September 1994 (59 FR 48136). The USFWS designated critical habitat for vernal pool fairy shrimp on 6 August 2003 (68 FR 46684). Vernal pool fairy shrimp were not known to occur on Vandenberg AFB at that time; thus Vandenberg AFB was excluded from the designation. In addition, section 4(b)(2) of the ESA excludes Vandenberg AFB from critical habitat designation. As a result, the proposed projects are not within critical habitat.

The vernal pool fairy shrimp is a small crustacean that occupies a variety of temporary wetland habitats, from small, clear, sandstone rock pools, to large, turbid, grassland valley floor pools, and vernal pools. Vernal pool fairy shrimp are found in temporary wetland habitats throughout the Central Valley and western Riverside County in California, and near Medford, Oregon (Eriksen and Belk 1999). This fairy shrimp species occurs in neutral to slightly alkaline pools throughout the California Central Valley, and in rock outcrop pools along the Interior Coast Ranges, south of the Sacramento River Delta.

Seasonal wetland habitats occur throughout Vandenberg AFB, and include vernal pools in relict dune habitats, grassland vernal pools, landslide pools, swales, stock tanks, toe drains, roadside ditches, and

human made depressions. Vernal pool fairy shrimp were documented in 2005 and 2006 in numerous temporary wetland habitats on Vandenberg AFB through federal protocol presence/absence surveys (SRS Technologies 2006b).

Southwestern Pond Turtle

The southwestern pond turtle is listed as a California Species of Concern by the CDFG. This aquatic turtle is associated with permanent or nearly permanent water in a wide variety of habitat types including ponds, lakes, streams, irrigation ditches, or permanent pools along intermittent streams. Southwestern pond turtles have been documented on Vandenberg AFB along San Antonio Creek, the Santa Ynez River, Cañada Honda Creek, and Punchbowl and Pine Canyon Lakes (Christopher 1995, 1996).

3.1.2 HABITATS

LF 21, LF 23, and LF 24

Habitat within the proposed route consists mainly of roadside areas that are dominated by non-native species. Between HH1965 A2 and HH 1964 A1, however, an open space area with small areas of coastal sage scrub habitat, non-native grasses, and tarplant (as described above) is present). Large patches of iceplant also occur within this open space area. An additional open space area occurs between HH 1962 A1 and HH 1962 A2. This area contains non-native grasses, tarplant, and seacliff buckwheat (as described above). The remaining areas within this proposed route are roadside habitat, which is dominated by non-native species, but also may contain tarplant.

LF 02 and LF 03

Habitats within the proposed route include roadside areas and open space areas with non-native vegetation. The proposed route is characterized as roadside habitat along Taft Road from Colt Road to Mina Road towards LF 02. This area is dominated by non-native grassland species. However, iceplant, curly dock, dudleya, tarplant and seacliff buckwheat also occur. The route from LF 02 to LF 03 is open space dominated by non-native species. Shuman Creek is to the south of the proposed route and is not within the project area.

El Rancho Road and RIDT

The proposed route from HH 1987-1 to HH 127 C1 is along the roadside. The disturbed roadside area includes non-native grasses, iceplant, and tarplant. The area south of El Rancho Road and the proposed route is fenced. This area, designated as the Titan Pasture, has been surveyed and is known habitat for tarplant. The proposed route is outside the fenced Titan Pasture.

Bishop Road

The habitat along the proposed route is a roadside area with non-native and native species. The proposed route passes through non-native grasses and native bunchgrasses. Chaparral habitat is also present near the proposed route and includes coyote brush, black sage, and chamise. There is a ditch northeast of the proposed route, however, the ditch does not contain a predominance of wetland vegetation. The proposed route does not intersect with the ditch. Oak trees occur in the vicinity of the proposed route, and an open space area dominated by non-native grassland also occurs near the proposed route. Tarplant is present in this open space area.

San Antonio Road West

Habitats within the proposed route include roadside areas and an agricultural field. Roadside areas have been mowed and include non-native grasses, mustard, telegraph weed, and tarplant. The agricultural field is lacking vegetation due to frequent disturbance (plowing). San Antonio Creek occurs within the

proposed route. The proposed route would be bored under San Antonio Creek, therefore, impacts to the creek, wetlands, and riparian vegetation would not occur.

Cross Road and Building 1768

Habitats within the proposed route include roadside areas that are dominated by non-native species. Species include non-native grasses, iceplant, and scattered tarplant and one individual of seacliff buckwheat. An unnamed waterway passes under the proposed route, however, this drainage would not be impacted by the proposed route. A eucalyptus grove exists near the unnamed waterway, but the grove is outside the proposed route.

3.2 CULTURAL RESOURCES

Cultural resources include prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or any other reason. Cultural resources are limited, nonrenewable resources whose potential for scientific research or value as a traditional resource to native peoples may be easily diminished by actions impacting their integrity.

The ROI¹ for cultural resources includes the six project segments that are widely scattered over north Vandenberg AFB.

Background research included an examination of the Vandenberg AFB GIS cultural resources layers and other data held at 30th Civil Engineer Squadron, Environmental Flight, Cultural Resources Section (30 CES/CEVNC), Vandenberg AFB (Peterson and Lebow, 2008). In addition, a records search at the Central Coast Information Center at the Anthropology Department, University of California, Santa Barbara was completed. Background research included a review of archaeological literature, archaeological base maps, and cultural resource records. Previous archaeological studies and archaeological resources within 0.25 mile of the proposed cable alignments were identified. Maps examined at 30 CES/CEVNC included the Vandenberg AFB C-1 series (46 map set), the Base Comprehensive Plan GIS, and US Geological Survey topographic maps.

This effort identified 84 previous archaeological studies within 0.25 mile of the various project routes. Previous studies included large-area surveys as well as archaeological inventories, testing, and monitoring related to various specific projects. The entire MDA Diverse Communications Project is covered by one or more of these studies, and all project components were previously surveyed for archaeological resources.

Background research also revealed that 28 isolated artifacts have been recorded within 0.25 mile of the MDA Diverse Communications Project, although none are within the project's ROI (Peterson and Lebow, 2008). Fifty-five archaeological or historical sites have been recorded within 0.25 mile of the MDA Diverse Communications Project (Peterson and Lebow, 2008). Of these, however, only 8 (CA-SBA-592, -733, -1926, -2696, -2887, -3040, -3288H, and -3527H) are within 100 feet of the project's ROI.

CA-SBA-592 is a low- to moderate-density lithic scatter with a few vertebrate and invertebrate faunal remains. Testing by Applied EarthWorks, Inc. in 1997 (Lebow) included 65 shovel test pits and 9 test excavation units, adequately defining the site's boundary. Based on the boundary defined by subsurface testing, the MDA Diverse Communications Project cable route passes near but does not cross the site. The site's eligibility for the National Register of Historic Places (NRHP) has not been formally evaluated.

¹ The term ROI is synonymous with the "area of potential effect" as defined under cultural resource regulations, 36 CFR 800.16(d).

CA-SBA-733 was originally described as a low- to moderate-density scatter of shell and chipping waste with some bone and ground stone. A site inspection for the MDA Diverse Communications Project revealed five loci, including two containing moderately dense shell midden, two scatters of lithic debitage and marine shell, and one apparent chert quarry. CA-SBA-733 is a contributing element of the San Antonio Terrace Archaeological District and is eligible for the NRHP. However, the GMD Diverse Communications Project passes through the southern margin of the site, which contains only a sparse scatter of lithic material, probably from raw material testing. Most of the route through the site area would be in road fill that is 3–10 feet deep. Applied EarthWorks tested the portion of the route that crosses native soil and found only a very sparse archaeological deposit (Peterson and Lebow, 2008). Vandenberg AFB determined that the cable route through CA-SBA-733 would not affect the site's significant qualities, and the SHPO concurred in a letter dated March 24, 2008 (Appendix B).

CA-SBA-1926 is a buried, multicomponent site dating to the Middle Period. Testing by Applied EarthWorks in 1997 found lithic debitage and tools, ground stone, beads, a possible pendant, marine and freshwater shell, and bones of deer, and possibly elk, rodents, bird, and fish. Faunal preservation is good. Archaeological materials were found to depths of 6 feet below the surface (Harro et al. 1997). CA-SBA-1926 was determined eligible for the NRHP in consultation with the SHPO on 23 October 1997. The MDA Diverse Communications Project would be installed in a raised road shoulder through the site. Due to the elevated road surface, and because the site itself is buried beneath noncultural native fill, the cable itself would not be deep enough to impact the buried archaeological deposit. Consequently, cable installation would not affect the site's significant qualities.

CA-SBA-2696 is a multicomponent prehistoric site buried under about 28 inches of noncultural sediments. Testing and subsequent data recovery excavations associated with the Mission Hills/Santa Ynez Extension of the Coastal Branch Aqueduct (Colton et al. 1997) found cultural materials to depths of nearly 10 feet, including lithic debitage and tools, abundant vertebrate faunal material, marine shell, and archaeobotanical remains. Radiocarbon analysis indicates that the site was occupied between approximately 370 B.C. and A.D. 590 with three periods of abandonment and reoccupation. The site was determined eligible for the NRHP in consultation with the SHPO on 22 June 1995. The cable would be installed by boring under the site, at a depth greater than 10 feet below the surface. Bore holes would be placed outside the site boundaries, which were defined by subsurface excavation.

CA-SBA-2887 is a low- to moderate-density lithic scatter, including lithic debitage, a few hammerstones, and two possible manos. The site was inspected for the MDA Diverse Communications Project, when it was found that the mapped site boundary coincides with the natural distribution of gravels and cobbles on the surface. Outside the boundary the surface is mainly sand with very few rocks or pebbles. The cable route is outside the site's mapped boundary, and no archaeological materials were found during Applied EarthWorks' inspection of the project route (Peterson and Lebow, 2008). The NRHP eligibility of CA-SBA-2887 has not been evaluated.

CA-SBA-3040 is recorded as a moderately dense scatter of lithic debitage and shatter with a few cores and core fragments. The site was inspected for the MDA Diverse Communications Project, when its location and condition were confirmed. The site boundary appears to coincide roughly with the natural distribution of rocks and cobbles on the surface, many of these were chert. The site probably represents opportunistic testing and collection of raw material exposed on the surface. The MDA Diverse Communications Project cable route is at least 65 feet outside the site's mapped boundary, and no archaeological materials were found in the project route during Applied EarthWorks' inspection (Peterson and Lebow, 2008). The NRHP eligibility of CA-SBA-3040 has not been evaluated.

CA-SBA-3288H was originally recorded as a sparse lithic and shell scatter with several historical structure remnants of unknown age and function. It was subsequently examined during a survey and evaluation of historical sites on Vandenberg AFB (Palmer 2000), at which time it was found that the site included foundation remnants and a refuse deposit from a Swiss-Italian dairy operation dating to the early twentieth century, and part of Port Petrol, an oil storage facility active from the 1930s up to the Korean War. The facility was acquired by the Army in 1942 and developed into a Camp Cooke petroleum supply depot. The site included buildings, sludge ponds, several storage tanks, pipelines, and various other facilities. During World War II, nine storage tanks, a house, and eight buildings existed at the shoreline portion of the site. Most of the facilities were removed after the end of the Korean War and almost nothing remains aside from earthen tank pads and concrete foundations. The prehistoric materials (four flakes, two pieces of shatter, one possible core, and two shell fragments) were noted on the eastern edge of the site. Abundant Monterey chert gravel and disturbance is evident in this part of the site, and the lithic debris may have been mechanically produced. The MDA Diverse Communications Project line passes through the site's eastern end. Part of this run is through an area that was graded and contoured during construction of a launch facility in 1964–1965. No known historical features are evident on the route east of the launch facility. The eligibility of CA-SBA-3288H has not been formally evaluated. However, consultation with the SHPO for an earlier cable project that ran from Point Sal Road to the launch facility on a route very similar to the MDA Diverse Communications Project, determined that the site would not be affected (Galbraith, 30 CES/CEVNC, personal communication 2007).

CA-SBA-3527H is the historical Juan Pedro Camp, represented by a low-density scatter of early twentieth century domestic artifacts and building materials that represent the remains of a historical camp associated with sheep grazing between the 1830s and 1950s. Remnants of a demolished wood frame and corrugated metal panel building and a historical road are reported; very little is visible today. The MDA Diverse Communications Project passes by the southern border of CA-SBA-3527H, and would be installed adjacent to a paved road. Installation of the cable would not affect the site, because the road is cut below the elevation of the site and a ditch lies between the road and the site. The site's NRHP eligibility has not been evaluated.

3.3 COASTAL ZONE MANAGEMENT

A federal activity in or affecting a coastal zone requires preparation of a Coastal Zone Consistency Determination by the proponent in coordination with the Vandenberg AFB Environmental Division. All federal development projects in a coastal zone and all federal activities which could directly affect a coastal zone must be consistent to the maximum extent practicable with the Coastal Zone Management (CZM) Program as authorized by the Coastal Zone Management Act of 1972. The CZM Programs are administered at the federal level by the Coastal Programs Division within the National Oceanic and Atmospheric Administration Administration's Office of Ocean and Coastal Resource Management.

At Vandenberg AFB, the coastal zone extends seaward out to the 3-nautical mile state water limit, and inland approximately 0.75 mile at the northern base boundary to approximately 4.5 mile at the southern end of the base (National Oceanic and Atmospheric Administration, 2004; Vandenberg AFB, 2005). The ROI for the Proposed Action includes those on-base areas within the coastal zone that could be affected by project-related activities. For the proposed diverse communications system, only the LF sites (LF 02, LF 03, LF 21, LF 23, and LF 24) are located within the coastal zone, per the Vandenberg AFB General Plan.

4.0 ENVIRONMENTAL CONSEQUENCES

This chapter describes the potential environmental consequences of the Proposed Action described in Chapter 2 by comparing it with the affected environmental resources described in Chapter 3. The SEA did not further analyze other resource areas—including air quality, water resources, geology and soils, land use, infrastructure, land use, socioeconomics, and environmental justice—because the MDA does not anticipate significant or other major impacts to these resources from implementation of the Proposed Action. The potential effects on these resources would not differ from those described in the GMD IDOC EA. A list of all agencies and organizations consulted as part of this analysis is provided in Chapter 6.

4.1 BIOLOGICAL RESOURCES

The primary proposed activities that may have a potential effect on the vegetation and wildlife of Vandenberg AFB include site preparation and staging activities for the communication line installation. These impacts would include vegetation disturbance and removal, as well as disturbance to wildlife from the associated noise and presence of personnel.

Installation of the communication lines could displace wildlife, however, similar vegetation exists near the affected areas for displaced wildlife. Typically the noise at 50 feet from a construction site does not exceed an equivalent sound level of 90 dBA. There are no absolute standards of short-term noise impacts for potentially noise-sensitive species. The effects of noise on wildlife vary from serious to no effect in different species and situations. Behavioral responses to noise also vary from startling to retreat from favorable habitat, due partly to the fact that wildlife can be very sensitive to sounds in some situations and very insensitive to the same sounds in other situations (Larkin, 1996).

Most of the site preparation noise and human activity would be caused by truck and other heavy machinery traffic to and from the IDOC facilities, as well as the potential short-term use of the heavy machinery. The increased presence of personnel would tend to cause birds and other mobile species of wildlife to temporarily evacuate areas subject to the highest level of noise. Additional ruderal vegetation is nearby for displaced wildlife.

All transportation of equipment and materials (such as fuels) would be conducted in accordance with DOT regulations and USAF regulations such as Air Force Policy Directive 24-2, Preparation and Movement of Air Force Materiel, and Air Force Instruction 24-201, Cargo Movement. Adherence to standard operating procedures for spill prevention, containment, and control measures while transporting equipment and materials would preclude impacts to biological resources.

4.1.1 IMPACTS TO SPECIAL-STATUS SPECIES

Avoidance and minimization measures for impacts to California red-legged frog, coast horned lizard, El Segundo blue butterfly, Gaviota tarplant, two-striped garter snake, unarmored threespine stickleback, and southwestern pond turtle are included in the proposed project. As a result of these avoidance and minimization measures, there would be no impacts to the habitat supporting special-status species in the project area on Vandenberg AFB.

Reconnaissance-level pre-construction surveys and construction monitoring would be conducted to minimize the risk of mortality to state species of concern during site clearing for those areas that require grading or vegetation removal. A description of the impacts to each special-status species that could be generated by the proposed project are detailed below.

IMPACTS TO CALIFORNIA RED-LEGGED FROG

Potential California red-legged frog habitat occurs near the Bishop Road, San Antonio Road West, and LF 02, LF 03 locations. The proposed routes, however, have been designed to minimize potential impacts to California red-legged frog habitat. In addition, all of the proposed routes occur in upland habitat. No work would occur within San Antonio Creek or associated riparian habitat. A bore machine would be used to bore beneath the creek to minimize impacts to San Antonio Creek. The bore entry and exit holes would be in the agricultural fields on the terraces north and south of San Antonio Creek. The bore entry point is planned to begin on the terrace approximately 460 feet to the south of the streambed, continue under San Antonio Creek at a depth between 5 and 20 feet below the streambed, and resurface in the northern terrace located approximately 660 feet to the north of the streambed. The boring route would follow an existing utility line. Direct impacts to San Antonio Creek would not occur. Indirect impacts may include increased sedimentation due to potential erosion from construction activities outside of the creek and its riparian habitat; however, BMPs would be implemented to reduce these indirect impacts. Aquatic habitat that is used by the California red-legged frog would not be affected by the proposed project. None of the proposed routes pass through California red-legged frog habitat; therefore, zero acres of California red-legged frog habitat would be impacted by the proposed project. Noise and vibration generated from activities may cause California red-legged frogs to temporarily abandon habitat adjacent to work areas. Such disturbance may increase the potential for predation and desiccation when California red-legged frogs leave shelter sites. A USFWS approved biologist conducting pre-construction surveys of the area and capturing and removing California red-legged frogs from the project area should minimize this effect.

The proposed project could adversely affect the California red-legged frog, but with implementation of the avoidance and minimization measures that are included in this project, the proposed project would minimally impact the species and its habitat. Therefore, the proposed MDA Diverse Communications Installation project would not jeopardize the continued existence of the California red-legged frog.

IMPACTS TO COAST HORNED LIZARD

The coast horned lizard has been previously reported in upland areas near the proposed San Antonio Road West location. With implementation of the avoidance and minimization measures for the coast horned lizard that are included in this project, the proposed project would minimally impact coast horned lizards and their habitat. Therefore, the proposed MDA Diverse Communications Installation project may affect, but is not likely to adversely affect, the coast horned lizard.

IMPACTS TO EL SEGUNDO BLUE BUTTERFLY

All of the proposed project areas are located outside of the known occupied habitat of the El Segundo blue butterfly based upon 2007 flight survey data.

The host plant for the El Segundo blue butterfly, seacliff buckwheat, occurs in the Cross Road and Building 1768; LF 02, LF 03; and LF 21, LF 23, LF 24 proposed locations. In each location, however, avoidance measures would ensure that a 2-foot buffer (in most areas, 10 or more feet) around each seacliff buckwheat would be created. The proposed project could adversely affect the El Segundo blue butterfly, but with implementation of the avoidance and minimization measures that are included in this project, the proposed project would minimally impact El Segundo blue butterflies and their habitat. The proposed MDA Diverse Communications Installation project would not jeopardize the continued existence of the El Segundo blue butterfly.

IMPACTS TO GAVIOTA TARPLANT

The proposed project would result in the short-term temporary loss of non-native grassland and ruderal communities, both of which are suitable habitat for the Gaviota tarplant. Installation of the fiber optic cable through either trenching or plowing would result in the temporary short-term loss of all vegetation within an approximately 4-inch-wide corridor. Any individuals of Gaviota tarplant present within that corridor would be lost, and the seed bank within that corridor would be disturbed as a result of excavation, which could delay or prevent the reestablishment of plants. Along road shoulders, however, Gaviota tarplant occurs in the low-quality habitat represented by the ruderal community and is subject to continuous disturbance as a result of mowing and road maintenance. In addition, plants that occur within this ruderal habitat are often isolated from high quality suitable habitat by nature of their location.

Table 4.1-1 quantifies the areas of temporary ground disturbance that would be impacted during construction. These areas are based on a 10-foot-wide vehicle corridor for line installation areas, and a 3 foot by 5 foot area of disturbance at man holes and hand holes. The acreages shown are for those areas where tarplant was previously mapped and are located within the proposed areas of disturbance. Overall, approximately 0.0632 acres of potential Gaviota tarplant habitat would be temporarily disturbed during construction.

Table 4.1-1: Gaviota Tarplant Temporarily Affected

Location	Area of Tarplant Impacted (ft²)	# Boxes In Tarplant	Box Area (ft²)	Total Area of Tarplant Impacted (ft²)	Total Acres of Tarplant Impacted
LF 21, LF 23, LF 24	546.8	0	0	546.8	0.0125
LF 02, LF 03	2139	0	0	2139	0.0491
RIDT	0	0	0	0	0
Bishop Road	0	0	0	0	0
San Antonio Road West	0	0	0	0	0
Cross Road and Building 1768	68.89	0	0	68.89	0.0016
			Total	2755	0.0632
Notes: Calculations based on disturbance area from machinery that is within areas occupied by tarplant. Calculations made based on areas where tarplant has been previously mapped in the proposed vehicle routes and proposed man hole and hand hole locations.					

The majority of the affected habitat shown in Table 4.1-1 occurs along the ruderal community of road shoulders. This habitat, although suitable, is not considered high quality for the species given the continuous disturbance it experiences as a result of mowing and road maintenance performed for safety purposes. In addition, this ruderal habitat in many sections (except RIDT) occurs in areas where there is no adjacent suitable habitat; individuals of the species that occur in these sectors are restricted to a long narrow corridor with no opportunity for expansion in the surrounding space. At RIDT, there is a fenceline between the adjacent tarplant habitat and the proposed route. The RIDT route would be installed outside the fenceline, and would not disturb the Gaviota tarplant population within the fenceline. Given these factors, the habitat shown in Table 4.1.4-1 is considered low quality.

Cross country areas are those that occur in open space, as opposed to along road shoulders. In cross country areas, it is not feasible to scrape and set aside the top 3 inches of soil. These areas are considered potential Gaviota tarplant habitat that would be temporarily impacted by the project. These areas are also not high quality habitat. For example, the area considered cross country in the LF 02, LF 03 route is located near LF 03. Several invasive plant species dominate this area, including iceplant. This is also the case for the cross country portion of the LF 21, LF 23, LF 24 route. Therefore, although cross country areas are not along road shoulders, they are still considered low quality Gaviota tarplant habitat. Effects to Gaviota tarplant would be insignificant upon implementation of the avoidance and minimization measures and overall temporary impact of 0.0632 acres of Gaviota tarplant. Permanent loss of Gaviota tarplant is not expected in any of the locations with implementation of avoidance and minimization measures. Impacts to Gaviota tarplant would be direct, indirect, and temporary for 0.0632 acres of Gaviota tarplant. Therefore, the proposed MDA Diverse Communications Installation project may affect, but is not likely to adversely affect, the Gaviota tarplant because the minimal impacts to plants growing within low quality habitat are insignificant.

IMPACTS TO TWO-STRIPED GARTER SNAKE

The two-striped garter snake is known to occur in the habitat near the proposed San Antonio Road West location. The proposed project occurs in upland areas. No work would occur within the creek or associated riparian habitat. A bore machine would bore beneath the creek to minimize impacts to San Antonio Creek. Direct impacts to San Antonio Creek would not be generated by the proposed project. Indirect impacts may include increased sedimentation, however, BMPs would be implemented to reduce these indirect impacts. Aquatic habitat that is used by the two-striped garter snake would not be affected by the proposed project. With implementation of the avoidance and minimization measures for the two-striped garter snake that are included in this project, the proposed project would minimally impact two-striped garter and its habitat. Therefore, the proposed MDA Diverse Communications Installation project may affect, but is not likely to adversely affect, the two-striped garter snake.

IMPACTS TO UNARMORED THREESPINE STICKLEBACK

The unarmored threespine stickleback is known to occur in San Antonio Creek. The proposed project occurs in upland areas. No work would occur within the creek or associated riparian habitat. A bore machine would bore beneath the creek to minimize impacts to San Antonio Creek. Direct impacts to San Antonio Creek would not be generated by the proposed project. Indirect impacts may include increased sedimentation, however, BMPs would be implemented to reduce these indirect impacts. The proposed project could adversely affect the unarmored threespine stickleback, but with implementation of the avoidance and minimization measures that are included in this project, the proposed project would minimally impact unarmored threespine stickleback and its habitat. Therefore, the proposed MDA Diverse Communications Installation project would not jeopardize the continued existence of the unarmored threespine stickleback.

IMPACTS TO VERNAL FAIRY SHRIMP

The proposed project would not impact the vernal pool fairy shrimp. The only proposed location that is near potential vernal pool fairy shrimp habitat is Bishop Road. The GIS data from Vandenberg AFB indicates that the proposed project route is considered unsuitable as habitat for the vernal pool fairy shrimp. Therefore, the Diverse Communications Installation project would have no effect on the vernal pool fairy shrimp.

IMPACTS TO SOUTHWESTERN POND TURTLE

The southwestern pond turtle is known to occur in San Antonio Creek. The proposed project occurs in upland areas, and no work would occur within the creek or associated riparian habitat. A bore machine would bore beneath the creek to minimize impacts to San Antonio Creek. Direct impacts to San Antonio Creek would not be generated by the proposed project. Indirect impacts may include increased sedimentation; however, BMPs would be implemented to reduce these indirect impacts. With implementation of the avoidance and minimization measures for the southwestern pond turtle that are included in this project, the proposed project would minimally impact southwestern pond turtle and its habitat. Therefore, the proposed MDA Diverse Communications Installation project may affect, but is not likely to adversely affect, the southwestern pond turtle.

4.1.2 IMPACTS TO HABITAT

The majority of the habitat that would be impacted by the proposed project is roadside habitat that is dominated by non-native species. However, small areas of open space habitat would be temporarily impacted by the proposed project. The proposed project would not involve work within wetland or riparian habitat, therefore, no impacts would be generated. BMPs would be implemented to protect habitats from indirect impacts, such as frac-out during the boring under San Antonio Creek.

4.1.3 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. Future Federal actions unrelated to the Proposed Action would require separate consultation under Section 7 of the ESA.

The majority of the proposed communications lines would be installed along existing road shoulders or in paved roads. These areas routinely undergo mowing and are subject to other disturbances associated with road and existing utilities maintenance. It is anticipated that disturbances would continue to occur, affecting this low quality Gaviota tarplant habitat. However, these disturbances have occurred on a continuous basis in the past, and Gaviota tarplant has also continued to resprout in these areas.

Access to the man holes and hand holes would continue to occur in the future for maintenance and repair purposes, with no other anticipated significant projects planned at any of these sites throughout the installation. Maintenance activities at MH are rare, and every attempt would be made in the future to minimize disturbance.

4.1.4 MITIGATING MEASURES

On June 20, 2008, Vandenberg AFB received a Biological Opinion prepared by the USFWS Ventura Fish and Wildlife Office (see Appendix A). The USFWS concluded in its Biological Opinion the Proposed Action could adversely affect the El Segundo blue butterfly, unarmored threespine stickleback, and the California red-legged frog, but minimization measures would reduce adverse impacts and therefore the Proposed Action would not jeopardize the continued existence of the El Segundo blue butterfly, unarmored threespine stickleback, or California red-legged frog. The MDA would implement a frac-out contingency plan to minimize the effects of a bentonite plume in the event of a frac-out, which should reduce the downstream effects to the California red-legged frog and unarmored threespine stickleback. The MDA would also implement the measures described in the Proposed Action to minimize and reduce the adverse effects on the El Segundo blue butterfly, unarmored threespine stickleback, and California red-legged frog.

To minimize adverse effects, the following measures would be implemented.

- If more than two El Segundo blue butterflies are found dead or injured, the Air Force must notify the Ventura Fish and Wildlife Office immediately. The Ventura Fish and Wildlife Office will review the project activities to determine if additional protective measures are needed. The cause of death or injury must be determined by a USFWS approved biologist. Project activities may continue during this review period, provided that all protective measures proposed by the Air Force and the terms and conditions of the Biological Opinion have been, and continue to be, implemented.
- The MDA or Air Force must contact the Ventura Fish and Wildlife Office if more than five unarmored threespine sticklebacks or five California red-legged frogs are found dead or injured. The cause of death or injury must be determined by a USFWS approved biologist. Project activities may continue during this review period, provided that all protective measures proposed by the Air Force and the terms and conditions of the Biological Opinion have been, and continue to be, implemented.
- The Biological Opinion identifies two biologists that are authorized to independently survey for, monitor, capture and relocate California red-legged frogs. The MDA or Air Force must request approval of any other biologist(s) it wishes to survey for, monitor, capture and relocate California red-legged frogs for the purposes discussed in the Biological Opinion. The request must be in writing and be received at least 15 days prior to any such activities being conducted.
- When capturing and relocating California red-legged frogs from the project area, the USFWS approved biologist(s) must minimize the amount of time that animals are held in captivity. During this time, they 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. California red-legged frogs must be captured by hand or dipnet and transported in buckets separate from other species.
- To avoid transferring disease or pathogens between aquatic habitats during the course of surveys and handling of California red-legged frogs, the USFWS approved biologist(s) must follow the Declining Amphibian Population Task Force's Code of Practice.
- A USFWS approved biologist(s) must conduct a training session for all project personnel prior to the onset of any ground-disturbing activities within the action area. At a minimum, this training must include a description of the El Segundo blue butterfly, California red-legged frog, the unarmored threespine stickleback, and their habitats; the general provisions of the Act; the necessity for adhering to the provisions of the Act; the penalties associated with violating the provisions of the Act; the specific measures that are incorporated into the description of the proposed action to avoid and/or minimize the adverse effects to the El Segundo blue butterfly, unarmored threespine stickleback, and California red-legged frog; the areas in which the project activities may be accomplished; and the corrective actions to take in the event of a frac-out within San Antonio Creek.
- A USFWS approved biologist must be present during the horizontal directional drilling under San Antonio Creek and be in close contact with the operator to be alert to factors that would indicate a potential frac-out. The USFWS approved biologist(s) must also have the authority to stop specific work activities until appropriate corrective measures are taken in the event of a frac-out.

4.2 CULTURAL RESOURCES

Six of the eight sites discussed in Section 3.3 would be avoided during the MDA Diverse Communications Project. Four of these sites (CA-SBA-592, -2887, -3040, and -3527H) are outside the cable route and would not be impacted by cable installation. Site CA-SBA-1926 is within the cable route, but the cable would be installed in road fill for the length of the site. The site is buried beneath native soil under the road fill, and the combination of road fill and the noncultural native soil is sufficient to provide a protective blanket over the archaeological deposit. Consequently, CA-SBA-1926 would not be impacted by installation of the cable. At CA-SBA-2696, the cable would be installed by boring beneath the site. Boring depth would be approximately 10 feet below the surface, ensuring that the cultural deposit is avoided. Boring and receiving pits would be outside the site boundary. Thus, CA-SBA-2696 would not be impacted by cable installation.

Most of the cable route through CA-SBA-733 is in road fill that would sufficiently protect the site. A short segment of the route crosses native soil within the site boundary. Testing in this area revealed only a sparse scatter of lithic debris (Peterson and Lebow, 2008), unlike the qualities that make the site eligible for the NRHP. Consequently, Vandenberg AFB determined that installation of the cable would not adversely affect the site's significant qualities.

The cable route passes through the eastern portion of CA-SBA-3288H. This portion of the site is already disturbed from construction of a launch facility in 1964–1965, and no historical features are evident in this portion of the site. Consequently, Vandenberg AFB determined that installation of the cable would not affect the site.

On March 24, 2008, the California SHPO agreed with Vandenberg AFB's no adverse affect finding for this project undertaking. As a result of these findings, no significant direct or indirect impacts to cultural resources are expected as a result of implementing the Proposed Action. No mitigation measures for cultural resources are required by the California SHPO. Vandenberg AFB would require an archaeologist and a Native American representative monitor any ground-disturbing work within the boundary of prehistoric site SBA-733 near LF-23, Soldado Road, and HH 1964 A2.

Cumulative Impacts

Vandenberg AFB has an Integrated Cultural Resources Management Plan already in place for the long-term protection and management of cultural resources that are found on the base. Also, per Federal and state regulations, and agreements with the California SHPO, Vandenberg AFB personnel regularly coordinate and consult with the SHPO and Native American representatives prior to implementing new projects where historical, archaeological, or traditional resources could be affected. As part of normal procedures, workers are informed of the sensitivity of cultural resources and the mitigation measures that might be required if sites are inadvertently damaged or destroyed, and security forces regularly patrol the base to help prevent potential vandalism and looting of such resources. Because of the requirements and procedures already in place, and the limited potential for proposed construction activities and operations to affect cultural resources on base, implementation of the activities at Vandenberg AFB is not expected to result in any significant cumulative impacts on these resources.

4.3 COASTAL ZONE MANAGEMENT

Most of the proposed diverse communication line activities at Vandenberg AFB would take place outside of the coastal zone. Only those activities for the LF sites would be within the coastal zone. Under the Proposed Action, the MDA and USAF would comply with Federal Coastal Zone Consistency regulations (15 CFR Part 930) and the California Coastal Zone Management Program. Because the proposed

activities would not have a significant impact on physical and natural resources, require implementation of new restrictions to beach access or other recreational areas, or adversely affect the visual qualities of the coastline, it is anticipated that the proposed activities would be found to be consistent with the goals and objectives of the California program. As part of coordination and consultation with the California Coastal Commission, a Negative Determination was sent to the Commission for their review and comment. The California Coastal Commission concurred with the Negative Determination and agreed that the proposed Diverse Communication System will not adversely affect coastal zone resources in their June 2, 2008 letter (Appendix C).

Cumulative Impacts

Vandenberg AFB contains over 35 miles of coastline consisting of a variety of natural communities, resources, and recreation areas. The base has taken many steps to protect and maintain coastal resources in collaboration with federal, state, and local agencies. This includes funding for research of marine mammals on base, enforcing the limited access regulations to key wildlife areas on base, and minimizing the closure of public beaches. Vandenberg AFB personnel regularly consult with the California Coastal Commission prior to implementing new projects that might affect the policies of the Coastal Zone Management Act. As a result, implementation of the Proposed Action at Vandenberg AFB is not expected to result in any significant cumulative impacts on Coastal Zone Management.

4.4 ENVIRONMENTAL EFFECTS OF THE NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction and operation of the Diverse Communications Installation project would not occur.

As a result, the potential for impacts resulting from proposed construction would not occur. Vandenberg AFB would continue ongoing operations, with environmental conditions expected to remain unchanged from that described for the Affected Environment in Chapter 3 of the SEA.

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6.0 LIST OF AGENCIES AND ORGANIZATIONS CONTACTED

The following agencies and organizations were consulted or provided information during the preparation of the SEA:

California Office of Historic Preservation, Sacramento, CA

US Fish and Wildlife Service, Ventura Field Office, Ventura, CA

Vandenberg Air Force Base Environmental Office, 30 CES/CEV

Vandenberg Air Force Base GeoBase Integration Office

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8.0 DISTRIBUTION LIST

The following is a list of agencies, organizations, and libraries that were sent a copy of the SEA and Draft FONSI. The SEA and Draft FONSI were also made available on the Internet at the below referenced web site.

Federal Agencies

US Fish and Wildlife Service, Ventura Field Office, Ventura, CA
US Environmental Protection Agency, Region IX, San Francisco, CA

State and Local Agencies

California Coastal Commission, San Francisco, CA
California Department of Fish and Game, Santa Barbara, CA
California Office of Historic Preservation, Sacramento, CA
Central Coast Regional Water Quality Control Board, San Luis Obispo, CA
Santa Barbara County Air Pollution Control District, Santa Barbara, CA
University of California, Santa Barbara, Dept. of Ecology, Evolution, and Marine Biology,
Santa Barbara, CA

Native American Tribes

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

Organizations

La Purisima Audubon Society, Lompoc, CA
Environmental Defense Center, Santa Barbara, CA
Sierra Club, Santa Barbara, CA
California Native Plant Society, Los Osos, CA

Libraries

Lompoc Public Library, Lompoc, CA
Davidson Library, University of California, Santa Barbara, CA
Santa Barbara Public Library, Santa Barbara, CA
Santa Maria Public Library, Santa Maria, CA

Web site

<http://www.mda.mil/mdalink/html/enviro.html>

APPENDIX A

***US FISH AND WILDLIFE SERVICE
RESPONSE***

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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:
2008-F-0287

June 20, 2008

Thomas P. DeVenoge
Chief of Conservation, Environmental Flight
30 CES/CEVN
1028 Iceland Avenue
Vandenberg Air Force Base, California 93437

Subject: Biological Opinion for the Missile Defense Agency's Diverse Communications Project at Vandenberg Air Force Base, Santa Barbara County, California (1-8-08-F-10)

Dear Mr. DeVenoge:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the Missile Defense Agency's (MDA) proposed diverse communications project on Vandenberg Air Force Base (VAFB) and its effects on the federally endangered Gaviota tarplant (*Deinandra increscens* ssp. *villosa*), El Segundo blue butterfly (*Euphilotes battoides allyni*), and unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), and the federally threatened California red-legged frog (*Rana aurora draytonii*), in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act)(16 U.S.C. 1531 et seq.). We received your request, dated February 8, 2008, in our office on February 13, 2008.

This biological opinion was prepared using information provided in your request for formal consultation, electronic and telephone communications between our staffs, and information available in our files. A complete administrative record for this biological opinion is available at the Ventura Fish and Wildlife Office.

CONSULTATION HISTORY

In your February 8, 2008, letter, you requested our concurrence that the MDA's proposed diverse communications project may affect, but is not likely to adversely affect, the Gaviota tarplant, El Segundo blue butterfly, unarmored threespine stickleback, or California red-legged frog. You determined that the project activities would result in "insignificant effects to Gaviota tarplant" because avoidance and minimization measures would be implemented as part of the project and the amount of Gaviota tarplant impacted would be minimal. You also determined that effects to the California red-legged frog and the El Segundo blue butterfly would be discountable because avoidance and minimization measures will be implemented as part of the project and there is a low probability of observing a California red-legged frog or El Segundo blue butterfly within the

Thomas P. DeVenoge (1-8-08-F-10)

2

proposed project area. Furthermore, you determined that the project may affect, but is not likely to adversely affect, the unarmored threespine stickleback because the project activities would minimally impact this subspecies.

We provided our comments concerning the proposed project to the U.S. Air Force (Air Force) via electronic mail on February 27, 2008; the Air Force responded to our comments on March 6, 2008 (L. Lum, VAFB biologist, pers. comm. 2008a). We reviewed the Air Force's responses and transmitted an electronic mail recommending that they incorporate best management practices (BMPs) into the project description, specifically to minimize the potential adverse effects of the proposed horizontal directional drilling under San Antonio Creek due to the potential for bentonite fluid to leak into the creek (referred to as a "frac-out") while conducting project activities. The Air Force provided a frac-out contingency plan on March 11, 2008 (Lum, pers. comm. 2008b).

Upon further review of the proposed project activities, your responses to our comments, and the frac-out contingency plan, we determined that we do not concur that the proposed project may affect, but is not likely to adversely affect, the El Segundo blue butterfly, unarmored threespine stickleback, or California red-legged frog. However, we do concur with your determination that the proposed project may affect, but is not likely to adversely affect, the Gaviota tarplant. Our determinations are explained in the following paragraphs.

Gaviota tarplant occurs throughout the project area, although the majority of the Gaviota tarplant individuals occur along road shoulders in ruderal habitats that are historically subject to routine maintenance and mowing. In addition, the MDA proposes to implement the following measures to avoid adverse effects to Gaviota tarplant: the MDA will minimize the area of disturbance to the maximum extent practicable; when feasible, the MDA will conduct project activities after seed set (October 1) and outside of the rainy season (January and February) in non-developed areas; Gaviota tarplant individuals will be flagged and avoided when possible and, if individual tarplants cannot be avoided, the MDA will scrape the top 3 inches of soil (containing the Gaviota tarplant seed bank), set it aside, and replace it within 1 week; and the MDA will not hydroseed in open-space areas. Therefore, because the MDA will implement measures to avoid adverse effects to the Gaviota tarplant and because only approximately 0.06 acre would be temporarily affected, mostly in habitats that are routinely impacted by maintenance and mowing activities, we concur with your determination that the proposed project may affect, but is not likely to adversely affect the Gaviota tarplant.

Surveys were not conducted for the El Segundo blue butterfly within the project area. The presence of coast buckwheat (*Eriogonum parvifolium*), the El Segundo blue butterfly's host plant, represents the potential for the El Segundo blue butterfly to occur within the proposed project area. In addition, some of the proposed project activities could occur during the time period when the El Segundo blue butterfly is typically active and some of those activities would occur in close proximity or adjacent to coast buckwheat plants. The proposed project activities could adversely affect the El Segundo blue butterfly's ability to breed, feed, or shelter (e.g., through accumulation of dust on flower heads), and we do not have information that describes

Thomas P. DeVenoge (1-8-08-F-10)

3

how butterflies would be affected due to the presence of large equipment operating near or adjacent to their habitat. Therefore, because surveys for the El Segundo blue butterfly have not been conducted within the proposed project area and we do not have information indicating that project activities would not adversely affect the El Segundo blue butterfly, we do not concur with your determination that the project may affect, but is not likely to adversely affect, the El Segundo blue butterfly.

The unarmored threespine stickleback occurs in San Antonio Creek. Because there is potential for a frac-out to occur within the creek while conducting the horizontal directional drilling, and the MDA's frac-out contingency plan would result in further adverse effects to San Antonio Creek and individual unarmored threespine sticklebacks and (or) its habitat, we do not concur that the proposed project may affect, but is not likely to adversely affect, the unarmored threespine stickleback.

The California red-legged frog occurs near several of the proposed project sites; however, all of the proposed activities would occur in upland habitats and no equipment or personnel would work within surface water or associated riparian habitat. In addition, the MDA will implement measures to minimize potential adverse effects to the California red-legged frog such as: conducting all work during daylight hours, conducting pre-construction surveys, and installing a fence around riparian habitat. However, because the California red-legged frog is known to occur within San Antonio Creek and there is a potential for a frac-out to occur within the creek, and the MDA's frac-out contingency plan would result in additional adverse effects to individual frogs and (or) their habitat, we do not concur with your determination that the proposed project may affect, but is not likely to adversely affect, the California red-legged frog.

On May 2, 2008, per the Air Force's request, we submitted a draft biological opinion for their review. The Air Force provided their comments on the draft biological opinion on May 22, 2008, via electronic mail. You provided mostly editorial comments; however, you also provided one comment to correct an avoidance measure concerning the Gaviota tarplant. Our draft biological opinion stated that the MDA will conduct project activities after seed set (October 1) and outside of the rainy season (January and February) in non-developed areas. The Air Force noted that this measure should include the words "when feasible." Therefore, we incorporated the correct avoidance measure into the biological opinion. We did not address most of the editorial comments.

Additionally, you provided supplementary survey data for the El Segundo blue butterfly. We note that this information was not provided to us upon initiation of formal consultation. In 2007, the Air Force conducted surveys on VAFB that were led by Dr. Gordon Pratt and Dr. Richard Arnold. The primary purpose of these surveys was to gain a better understanding of the distribution the El Segundo blue butterfly on VAFB (Mantech SRS Technologies 2008). Some of the areas that the surveyors visited were within 1 mile of some of the proposed project areas. No El Segundo blue butterflies were observed in these surrounding areas. Therefore, you requested that we reevaluate the potential impacts to the El Segundo blue butterfly from the proposed project because you determined that effects to the El Segundo blue butterfly would be

Thomas P. DeVenoge (1-8-08-F-10)

4

extremely unlikely to occur based upon the lack of butterflies observed in surrounding areas, and because you will implement avoidance and minimization measures as part of the project description to reduce the potential effects to the El Segundo blue butterfly.

Upon review of your comments and the supplementary survey data, we determined that we do not concur with your determination that the proposed project may affect, but is not likely to adversely affect, the El Segundo blue butterfly. We based our determination on three factors. Firstly, failure to find an El Segundo blue butterfly in a given location during the 2007 surveys is not necessarily indicative that this species is absent (Mantech SRS Technologies 2008). The survey results are not appropriate for providing an estimate of abundance, a population index, or an accurate estimate of potential habitat on VAFB (Mantech SRS Technologies 2008). Secondly, due to low rainfall in the winter of 2006-2007, many coast buckwheat plants did not flower during the summer of 2007 or produced fewer and smaller flower heads that would have been produced during a year of average rainfall (Mantech SRS Technologies 2008). The winter of 2006-2007 was one of the driest years on record for VAFB, receiving 44 percent of historic average rainfall between July 2006 and June 2007 (VAFB 2008). The low rainfall may have contributed to an abbreviated flight season with few El Segundo blue butterflies emerging from diapause (Arnold 2007) and in locations where populations are small this would result in a decrease in likelihood of detecting El Segundo blue butterflies during surveys (Mantech SRS Technologies 2008). Many species of butterflies, including blues related to the El Segundo blue butterfly, living in desert habitats are not observable in years characterized by extremely low annual rainfall (Pratt and Ballmer 1987, Pratt 1988, Mattoni et al. 1997). Therefore, not observing the El Segundo blue butterfly within 1 mile of the proposed project areas does not indicate that the coast buckwheat plants within the proposed project area are unoccupied. Lastly, you proposed to avoid potentially affecting the El Segundo blue butterfly during its active season, to the extent practicable, by scheduling to work in areas furthest from coast buckwheat plants first and then work in areas that contain coast buckwheat plants closer to the end of the butterfly's active season. Conversely, it could also be possible that the MDA would conduct project activities when El Segundo blue butterflies are present, and because we don't know if the coast buckwheat plants in the proposed project area are occupied, the proposed project could adversely affect the El Segundo blue butterfly.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The MDA proposes to upgrade the communications system at VAFB to augment the existing distribution infrastructures, and install new fiber optic cable to deliver a high-speed, broadband, and robust digital information transport system. The new communication lines would be redundant to existing lines to ensure communications availability in the event one line is interrupted. To meet this requirement, the new communications line and existing line must be separated by at least 12 feet. In areas where the proposed line and existing line would cross, the proposed line would be encased in concrete.

Thomas P. DeVenoge (1-8-08-F-10)

5

The MDA would install approximately 31,442 feet of communication line along with manholes and handholes using a combination of installation methods such as trenching, plowing (with and without vibration), and horizontal directional drilling. The MDA proposes to install communication lines and associated infrastructure at the following six locations on VAFB:

1. Launch Facility (LF) 21, LF 23, and LF 24;
2. LF 2 and LF 3;
3. Relocatable In-flight Interceptor Communications System Data Terminal (RIDT);
4. Bishop Road;
5. San Antonio Road West; and
6. Cross Road and Building 1768.

The MDA coordinated with VAFB staff during the development of the project to avoid or minimize potential adverse impacts to biological resources. Consequently, the MDA incorporated alternate routes, alternate locations within existing routes, alternate construction methods, and designated staging areas into the project description. As a result, the majority of the communication lines would be installed on or adjacent to road shoulders and the staging areas would be located within existing roadways or adjacent to existing infrastructure such as manholes. Moreover, as part of the project description, the MDA will implement the following measures to avoid or minimize adverse effects to the El Segundo blue butterfly, unarmored threespine stickleback, and California red-legged frog:

El Segundo blue butterfly

1. The MDA will schedule to work in areas furthest from coast buckwheat plants first and then work in areas that contain coast buckwheat plants near the end of the flight season, to the extent practicable;
2. Project vehicles working in near areas with coast buckwheat plants during the adult flight season (June 1 to September 15) will travel at speeds of no more than 5 miles per hour;
3. The MDA will flag and/or install construction fencing around coast buckwheat plants that are near the project activities; a qualified biologist will monitor the installation of the fence; and
4. The MDA will maintain a 2-foot buffer around coast buckwheat plants.

Thomas P. DeVenoge (1-8-08-F-10)

6

Unarmored threespine stickleback

1. The MDA will implement erosion control BMPs, such as installing erosion control mats, straw wattles, and silt fencing, during the boring activities;
2. The MDA will implement a contingency plan in the event of a frac-out within San Antonio Creek;
3. Equipment maintenance and refueling will be conducted at least 500 feet from the riparian habitat and wetland, in pre-designated areas. Secondary spill containment will be used during the operations; and
4. All debris and other project spoils will be removed from the site and disposed of according to VAFB regulations.

California red-legged frog

1. All project activities will occur during daylight hours;
2. No project activities will occur in riparian habitat or ponds;
3. A Service-approved biologist will conduct pre-construction surveys 1 week prior to the start of project activities. If a California red-legged frog is observed, a Service-approved biologist will capture and relocate frogs in the project area. The Service-approved biologist will then install fencing to delineate the project area;
4. The MDA will implement BMPs, such as installing erosion control mats, straw wattles, and silt fencing, to avoid sedimentation and protect water quality; and
5. At the San Antonio Road West site, a qualified biologist will conduct pre-construction surveys each day throughout the duration of the project and will monitor the installation of fencing around riparian habitat at the project area.

STATUS OF THE SPECIES

El Segundo blue butterfly

The El Segundo blue butterfly was listed as endangered on June 1, 1976 (Service 1976). Critical habitat for the species has not been designated. We issued the Recovery Plan for the El Segundo blue butterfly on September 28, 1998 (Service 1998). The El Segundo blue butterfly was formally described by Oakley Shields (1975) based on specimens that had been collected in the city of El Segundo.

Thomas P. DeVenoge (1-8-08-F-10)

7

The El Segundo blue butterfly is in the family Lycaenidae. It is one of five subspecies comprising the polytypic species, the square-spotted blue butterfly (*Euphilotes battoides*). These butterflies inhabit southern California, southern Nevada, Arizona, and northern Mexico. The El Segundo blue butterfly is presumed to be endemic to southwestern Los Angeles County in coastal southern California. The adults have a wingspan of 0.75 to 1.25 inches. The wings of males are a brilliant blue color with an orange border on the rear of the upper hindwings. The females have dull brown colored wings with an orange border on the upper distal surface of the hindwings (Service 1998).

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. 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 from September until 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).

Historically, the El Segundo blue butterfly likely inhabited much of the El Segundo Dunes. 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). There are known populations at four locations: 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).

Thomas P. DeVenoge (1-8-08-F-10)

8

The precise habitat requirements of El Segundo blue butterflies are not fully understood. Because El Segundo blue butterflies depend solely on coast buckwheat, their distribution is dependent upon the occurrence of coast buckwheat. The known range of coast buckwheat is greater than the range of the El Segundo blue butterfly; coast buckwheat extends from San Diego County to the northern end of Monterey County (Pratt, pers. comm. 2006b). However, El Segundo blue butterflies have not been definitively confirmed north of the Ballona Wetlands in Los Angeles County (Mattoni 1990). Additionally, 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, other insects utilizing coast buckwheat, and habitat fragmentation. Relatively fast-growing exotics such as acacia (*Acacia* spp.), iceplant (*Carprobrotus* spp.), other *Eriogonum* species, and non-native grasses compete with coast buckwheat by inhibiting seedlings from sprouting and maturation of juveniles (Mattoni 1990). Habitat fragmentation produces edge effects that facilitate the introduction of invasive, non-native plant species that have the ability to out-compete and displace coast buckwheat.

El Segundo blue butterflies are also adversely affected by competition, predation, and parasitism by other insect species that utilize coast buckwheat flower heads. Pratt (1987) observed numerous insects living in coast buckwheat inflorescences along with El Segundo blue butterfly larvae, including lepidopterous larvae in the families of Cochyliidae, Gelechiidae, Geometridae, Riodinidae, and even other Lycaenidae.

Habitat fragmentation is detrimental to small, isolated populations. 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). Given the low dispersal potential of El Segundo blue butterflies, it is unlikely that this species will naturally recolonize a site.

Newly discovered population at VAFB

The El Segundo blue butterfly was recently reported to occur at VAFB in 2005 by Dr. Gordon Pratt and in 2007 by Dr. Pratt and Dr. Richard Arnold (Pratt, pers. comm. 2006a; L. Bell, Vandenberg Air Force Base biologist, pers. comm. 2007). However, it is not completely clear if the individuals observed at VAFB are actually the El Segundo blue butterfly or morphologically similar species. 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

Thomas P. DeVenoge (1-8-08-F-10)

9

other known *Euphilotes battoides* group taxon (G. Ballmer, Department of Entomology, University of California Riverside, pers. comm. 2006; Pratt, pers. comm. 2006c). Therefore, we consider this species to be the El Segundo blue butterfly until we receive definitive information demonstrating otherwise. 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. Butterflies in the genus *Euphilotes* can be very similar morphologically yet significantly different genetically (Mattoni 1990; Pratt 1994). 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.

The uncertain taxonomic status of the populations that were recently discovered at VAFB makes it impossible to assess whether the current distribution of the El Segundo blue butterfly is different from the range previously stated. To definitively determine the identity of these butterflies, VAFB has collected male individuals to compare the genetic signatures among the butterflies from VAFB with known El Segundo blue butterflies. However, clarifying the taxonomic status of these populations will not be trivial as *Euphilotes* is a diverse genus with known cryptic speciation (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 (Ballmer, pers. comm. 2006). Based on the most recent surveys in 2007, VAFB contains a tentative total of 17,470 potentially occupied acres, which was determined by buffering the known El Segundo blue butterfly localities by 1 mile (the approximate maximum dispersal distance of the subspecies).

Unarmored threespine stickleback

The unarmored threespine stickleback was listed as endangered in 1970 primarily due to competition with or predation by non-native fish, loss of habitat through urbanization and channelization, and introgression with other subspecies of sticklebacks (Service 1970). Critical habitat for the unarmored threespine stickleback was proposed in 1980 for two reaches of the Santa Clara River, and single reaches of both San Francisquito Creek and San Antonio Creek; designation of critical habitat remains pending (Service 1980). The unarmored threespine stickleback is a fully protected species under California law (see California Fish and Game Code, Section 5515 (b)(9)). The recovery plan for the unarmored threespine stickleback (Service 1985) provides additional information on the biology of the species, reasons for its decline, areas of essential habitat, and the actions needed for recovery of the species.

Unarmored threespine sticklebacks are small fish (up to 2.36 inches) inhabiting slow moving reaches or quiet water microhabitats of streams and rivers. Favorable habitats usually are shaded by dense and abundant vegetation. In more open reaches, algal mats or barriers may provide refuge for the species. Unarmored threespine sticklebacks feed primarily on benthic insects, small crustaceans, and snails, and to a lesser degree, on flat worms, nematodes, and terrestrial insects. Unarmored threespine sticklebacks reproduce throughout the year with a minimum of

Thomas P. DeVenoge (1-8-08-F-10)

10

breeding activity occurring from October to January. Reproduction occurs in areas with adequate aquatic vegetation and gentle flow of water where males establish and vigorously defend territories. The male builds a nest of fine plant debris and algal strands and courts all females that enter his territory; a single nest may contain the eggs of several females. Following spawning, the males defend the nests and the newly hatched fry, which hatch after approximately 6 days. Unarmored threespine sticklebacks are believed to live for only 1 year (Service 1985).

Unarmored threespine sticklebacks historically were distributed throughout southern California but are now restricted to the upper Santa Clara River and its tributaries in Los Angeles and Ventura Counties, San Antonio Creeks on VAFB in Santa Barbara County, Shay Creek (tributary to Baldwin Lake) in San Bernardino County, and San Felipe Creek in San Diego County. A population was transplanted into San Felipe Creek in the Salton Sea drainage and into Cañada Honda Creek on VAFB. Transplanted populations tend not to persist (Moyle 2002). In fact, no individuals have been observed in Cañada Honda Creek in 13 years (Rhys Evans, VAFB Natural Resource Manager, pers. comm. 2008).

Habitat degradation in the form of flood control and channelization are the primary threats to the survival of the unarmored threespine stickleback. Other forms of habitat degradation can occur when people or livestock trample stream banks, causing increased soil erosion and sedimentation in streams and breeding pools and reducing the availability of plants and insects that serve as habitat and food for the species. Damage to, or destruction of, the emergent vegetation along the stream banks also degrades the shallow, weedy nursery areas that provide abundant food and shelter for unarmored threespine stickleback.

Other threats to unarmored threespine stickleback often occur in popular riparian areas near campgrounds where humans dam pools for wading and inadvertently trample adjacent sand or gravel bars during streamside recreational activities. These activities force the unarmored threespine stickleback to constantly move away from human traffic or be driven into areas where they are more susceptible to injury or mortality due to predation or recreational activities.

Exotic predators such as African clawed frogs, bullfrogs (*Rana catesbeiana*), mosquitofish (*Gambusia affinis*), red swamp crayfish (*Procambarus clarkii*), and green sunfish (*Lepomis cyanellus*), prey on or compete for resources with unarmored threespine sticklebacks. In addition, certain exotic species may serve as vectors for the Ich parasite (*Ichthyophthirius multifiliis*) that could infect populations of unarmored threespine stickleback. Populations of unarmored threespine stickleback in the Angeles National Forest were severely affected by the introduction of Ich in 1995 (U.S. Forest Service 2000). Introduced goldfish (*Carasius auratus*) were suspected to be the source of the Ich infestation.

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 (Service 2006). The Service completed a recovery plan for the subspecies in 2002 (Service 2002).

Thomas P. DeVenoge (1-8-08-F-10)

11

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. Tadpoles probably eat algae (Jennings et al. 1992). 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). Feeding activity probably occurs along the shoreline and on the surface of the water. 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 spring flows and cold temperatures in streams during the spring often make these sites risky environments for eggs and tadpoles (Service 2002). 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 likely 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

Thomas P. DeVenoge (1-8-08-F-10)

12

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).

The historic 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 5 extant populations, compared to approximately 26 historical records (Service 2006). Currently, California red-legged frogs are known from 3 disjunct regions in 26 California counties and 1 region in Baja California, Mexico (Grismer 2002; Fidenci 2004; and R. Smith and D. Krofta, in litt. 2005).

California red-legged frogs have been found at elevations that range from sea level to about 5,000 feet. In the Sierra Nevada Mountains, California red-legged frogs typically occur below 4,000 feet in elevation (Service 2006).

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, and signal crayfish (*Pacifastacus leniusculus*). Chytrid fungus (*Batrachochytrium dendrobatidis*) is a waterborne fungus that can decimate amphibian populations, and is considered a threat to California red-legged frog populations.

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 Code of Federal Regulations (CFR) 402.02). For the purposes of this biological opinion and based on information provided by the MDA and the Air Force, we consider the action area to include four of the six project areas. Coast buckwheat plants occur at three of the project areas; California red-legged frog habitat occurs near three of the project areas, but with the avoidance measures that the MDA will implement, the project activities should only affect the California red-legged frog at one project area; and the unarmored threespine stickleback is present at one area (See Table 1). Specifically, the action area for the El Segundo blue butterfly incorporates the areas of the communications line that would be installed near coast buckwheat plants. For the California red-legged frog and unarmored threespine stickleback, the action area includes a portion of San Antonio Creek directly above the bore hole and a short, but unspecified distance downstream due to a potential frac-out and the equipment proposed for use in the event of a frac-out.

Thomas P. DeVenoge (1-8-08-F-10)

13

Table 1. El Segundo blue butterfly, unarmored threespine stickleback, and California red-legged frog occurrences at the six proposed project sites.

Species	LF-21, LF-23, LF-24	LF-2, LF-3	RIDT	Bishop Road	San Antonio Road West	Cross Road/ Building 1768
El Segundo blue butterfly	X	X				X
Unarmored threespine stickleback					X	
California red-legged frog		X		X	X	

For this project, surveys were not conducted during the period when the El Segundo blue butterfly is typically active and observable; however, Tetra Tech, Inc. conducted surveys for its host plant on November 20, 2007. Several coast buckwheat plants occur in an area between Soldado Road and LF-21 and west of LF-24. Coast buckwheat plants are present within a 150-foot section along Taft Road, west of LF-2 and LF-3. One coast buckwheat plant was observed near the Cross Road communication line installation route.

Dr. Pratt and Dr. Arnold led a survey effort during the summer of 2007, with assistance from VAFB staff and Mantech SRS Technologies, to document where the El Segundo blue butterfly occurs on VAFB. The survey methodology included selecting sites at approximate 1-mile intervals in large contiguous stretches of potentially suitable habitat within the extensive coastal sand dune habitat on north VAFB; visiting locations known to be occupied by the El Segundo blue butterfly and expanding the survey to a wider perimeter until no additional butterflies were observed or potential habitat ceased; and surveying suitable habitat locations not previously known to support the El Segundo blue butterfly (Mantech SRS Technologies 2008).

During the 2007 survey effort, the surveyors visited various locations on VAFB and some of the areas were within 1 mile of the three project areas that contain coast buckwheat plants. Surveys were conducted approximately 0.5 mile away from LF-21, adjacent to LF-24; approximately 0.75 mile away from LF-21, adjacent to Minuteman Beach; and approximately 0.98 mile away from LF-21, near the eastern edge of the base. No El Segundo blue butterflies were observed. Surveys were also conducted approximately 0.2 mile south of LF-2 and LF-3 along 1.5 miles of Point Sal Road. Surveys documented the El Segundo blue butterfly approximately 1.2 miles southwest of LF-2 and LF-3 on San Antonio Terrace, which is the closest individual to the proposed project areas and is the northernmost occurrence on VAFB. Surveys continued an additional 0.5 mile north toward LF-2 and LF-3 and stopped approximately 0.7 mile south of LF-2 and LF-3. No individuals were observed. Lastly, surveys were conducted within the Cross Road project area, west of the 13th Street and Cross Road intersection, and approximately 0.8 mile northwest of Building 1768. No coast buckwheat plants were observed in these areas.

Surveys for the unarmored threespine stickleback were not conducted for this project; however, San Antonio Creek has been surveyed numerous times in previous years for the presence of unarmored threespine sticklebacks and other special-status fishes. The following information

Thomas P. DeVenoge (1-8-08-F-10)

14

was obtained from the Special-Status Fish Species Survey Report for San Antonio Creek (Tetra Tech 1999).

Dr. Camm Swift conducted surveys for special-status fish in San Antonio Creek from around the Lompoc-Casmalia Road Crossing downstream to the lagoon (Tetra Tech 1999). The Lompoc-Casmalia road crossing is approximately 1.5 miles downstream of the area where the MDA would bore under the creek to place the communication line. Dr. Swift surveyed San Antonio Creek by visual surveys confirmed by occasional seine hauls; careful seining, removal, counting, measuring, and returning of all fishes in 100-meter sections in the creek; setting and monitoring a downstream trap for seaward migrating steelhead (*Oncorhynchus mykiss*) just above Lompoc-Casmalia Road; and careful seining of multiple, 25-square-meter quadrants in the lagoon, primarily to obtain quantitative estimates of the federally endangered tidewater goby (*Eucyclogobius newberryi*) population in the lagoon (Tetra Tech 1999).

The unarmored threespine stickleback was the most common fish observed in the creek above the lagoon and is much more abundant in the upper half of the creek area that was surveyed due to the lower stream gradient, slower water velocity, more spread out channel, and lack of native or invasive aquatic predators. The unarmored threespine stickleback comprised approximately 70 percent of fish observed (excluding the survey transects and lagoon surveys) and comprised 99 percent of fish observed in the transects along with small numbers of arroyo chub (*Gila orcutti*), prickly sculpin (*Cottus asper*), mosquitofish, and tidewater goby (Tetra Tech 1999).

Approximately 48,000 unarmored threespine sticklebacks were estimated to inhabit the lower 8 kilometers of the creek above the lagoon with an average of 1.94 sticklebacks per meter, assuming that the deeper ponded areas not represented in the survey transects had about the same number of sticklebacks as the areas surveyed. The density of stickleback was the highest in the 2 kilometers above and below the El Rancho Road crossing, which is approximately 2.5 miles downstream of the project site. The unarmored threespine stickleback occurs upstream of VAFB in San Antonio Creek at least as far as Barka Slough (Tetra Tech 1999).

Protocol-level surveys were not conducted for the California red-legged frog within the project areas; however, California red-legged frogs have been documented in nearly all permanent streams and ponds on VAFB. Surveys conducted by Dr. Susan Christopher from 1995 to 2002 documented the presence of California red-legged frogs in various life stages in 98 out of 109 ephemeral, wetland, and riparian sites surveyed on VAFB. The highest concentrations of California red-legged frogs are in San Antonio Creek and the permanent ponds (J. Uyehara, VAFB biologist, pers. comm. 2008).

EFFECTS OF THE ACTION

The Air Force's proposed project activities could adversely affect the El Segundo blue butterfly, unarmored threespine stickleback, and California red-legged frog. The Air Force will install approximately 7,480 feet of communication line within the project area of LF-21, LF-23, and LF-24; approximately 5,400 feet within the LF-2 and LF-3 project area, and approximately 5,760

Thomas P. DeVenoge (1-8-08-F-10)

15

feet at the cross road project area. The combination of methods the MDA would use to install the communication lines in these areas would have an average disturbance zone 10 feet wide. The MDA would install a communication line under San Antonio Creek using horizontal directional drilling; the linear section bored under the creek would measure approximately 1,300 feet.

El Segundo blue butterfly

Coast buckwheat plants, which represent potential habitat for the El Segundo blue butterfly, are present within three of the six project areas. Based on the 2007 survey effort, all of the project areas are located outside of the area where this butterfly was observed; however, because surveys were not conducted within the project areas during the period when El Segundo blue butterfly adults are typically active, we do not know if the El Segundo blue butterfly is present within these areas. The 2007 surveys visited surrounding areas within 1 mile of the three project areas and did not observe the El Segundo blue butterfly in these areas. However, as stated previously, the failure to detect El Segundo blue butterflies in a given location during the 2007 surveys does not conclusively demonstrate that this butterfly is absent. Therefore, we assume that the El Segundo blue butterfly could occupy the coast buckwheat plants within the project areas.

At the three project areas that contain coast buckwheat plants, the MDA worked with the Air Force to delineate the communication line installation routes to avoid coast buckwheat plants. Consequently, the majority of the communication lines would be installed along road shoulders consisting mostly of ruderal vegetation that is subject to historical road maintenance and mowing activities. The staging areas would be located within existing roadways or adjacent to existing infrastructure. Additionally, the MDA will maintain a 2-foot buffer around coast buckwheat plants when conducting the project activities. Therefore, the installation of the communication lines should not directly affect coast buckwheat plants. However, the MDA could adversely affect the El Segundo blue butterfly because some of the activities would occur in the vicinity of coast buckwheat plants and the MDA could conduct some of the project activities during the time period when El Segundo blue butterflies are typically active.

Moving vehicles could cause mortality by striking adult butterflies in flight if they fly through the project areas. Larvae could also be crushed by the movement of vehicles and personnel; however, the implementation of a 2-foot buffer around all coast buckwheat plants should reduce the potential to crush larvae moving on the soil surface or diapausing pupae.

The vehicles and equipment that would be used to install the communication lines could generate dust that drifts onto nearby stands of coast buckwheat. The generation of dust may adversely affect El Segundo blue butterflies by disrupting their normal behavioral patterns such as breeding and feeding. Adult butterflies, upon emergence from the soil, fly to the flower heads of coast buckwheat in search of potential mates. Dust may cause adults to leave the area in search for other host plants. The deposition of dust on coast buckwheat may also reduce the palatability of the flower heads for feeding larvae. Because the life span of the adults is typically less than 2 weeks, precluding or disrupting normal behaviors could be detrimental to the production of the

Thomas P. DeVenoge (1-8-08-F-10)

16

next generation of butterflies. We assume that the potential deposition of dust on coast buckwheat plants would attenuate the further the plants are from the ground-disturbing activities. Scheduling road maintenance for periods when soils retain moisture from winter rains could reduce any adverse effects from dust.

Conducting the project activities could also produce conditions suitable for the establishment of invasive plant species that may spread and out-compete coast buckwheat plants that are growing nearby. However, because the majority of the communication lines would be installed on road shoulders where most of the vegetation is ruderal due to the routine maintenance and mowing activities, conducting the project activities should not substantially increase the amount of non-native species within the project area once the activities are completed.

Unarmored threespine stickleback

The horizontal directional drilling method that the MDA would use to bore under San Antonio Creek to place the communication line requires a 500-square-foot work area at the bore entry and exit points and the use of bentonite as drilling slurry. Bentonite fluid is pumped through the borehole to lubricate the drill bit, carry drill cuttings to the surface, and prevent the bore tunnel from collapsing (Service 2007). During the drilling process, a frac-out could occur in which the bentonite slurry can leak from the borehole through fissures or cracks in the soil and reach the surface. A frac-out can occur at any point along the directional bore, but the risk for a frac-out is greatest at the bore entry and exit points and the risk declines as the depth of the drill head increases. The potential for a frac-out within the creek could be reduced by geological core sampling along the pipeline alignment to look for substrate anomalies or potential obstructions (National Marine Fisheries Service 2003).

Bentonite is largely a bentonite clay-water mixture and is not classified as a toxic or hazardous substance. However, if a frac-out occurs and the bentonite is released into the waterway, the unarmored threespine stickleback could be adversely affected because released bentonite would increase the turbidity of the water at the release point and for some distance downstream, depending on the amount of drilling fluid released, the length of time it was released, the velocity of the water at the release site, and the volume of water in San Antonio Creek at the time of release (Service 2007). Bentonite is a very fine clay with positive and negative charges on its surface. These clay particles are attracted to oppositely charged surfaces, such as gill membranes, and could adhere to them, which makes bentonite particularly detrimental to aquatic organisms because affected organisms may suffocate if exposed to high concentrations of the slurry, overwhelming the animal's ability to clear the impacted gill filaments through physiological processes such as "coughing" or mucous secretion (National Marine Fisheries Service 2003). In addition, sticklebacks are visual feeders and they specialize in feeding on a limited number of organisms and are rather slow to learn to exploit new sources of food (Moyle 2002). Therefore, increased turbidity could reduce the stickleback's ability to capture food or impair other normal behaviors that are essential to growth and survival.

Thomas P. DeVenoge (1-8-08-F-10)

17

California red-legged frog

Because the project areas at LF-2 and LF-3 and Bishop Road would not occur in aquatic or riparian habitats, and the MDA will implement measures to avoid or minimize adverse effects to the California red-legged frog, the activities at those project areas should not adversely affect California red-legged frogs. However, a potential frac-out within the San Antonio Creek project area could adversely affect California red-legged frogs because bentonite released into the creek would increase the turbidity of the water at the release point and for some distance downstream, depending on the amount of drilling fluid released, the length of time it was released, the velocity of the water at the release site, and the volume of water in San Antonio Creek at the time of release (Service 2007). This turbid water could smother eggs of the California red-legged frog and alter the quality of the habitat to an extent that precludes the use by individuals. Additionally, temporary pulses of sediment during construction may cover algae and suffocate bottom-dwelling organisms, which could lead to a reduction in prey species and increase competition for food.

Noise and vibration generated from the repair activities may cause California red-legged frogs to temporarily abandon habitat adjacent to work areas. Such disturbance may increase the potential for predation and desiccation when California red-legged frogs leave shelter sites. A Service-approved biologist conducting pre-construction surveys of the area and capturing and removing California red-legged frogs from the project area should minimize this effect.

Capturing and handling California red-legged frogs to move them from a work area may result in injury or mortality as a result of improper handling, containment, transport of individuals, or from releasing them into unsuitable habitat. These effects would be reduced or prevented by the use of a Service-approved biologist.

In summary, the MDA coordinated with the Air Force to design the project to reduce the adverse impacts to biological resources, and they will implement additional measures as part of the project description to further reduce the adverse effects of the project. Therefore, conducting the project activities would have a temporary adverse effect on the El Segundo blue butterfly. The unarmored threespine stickleback and California red-legged frog would be adversely affected in the event of a frac-out in San Antonio Creek. The degree of impacts would be dependent upon the amount of drilling fluid released, the length of time it was released, the velocity of the water at the release site, and the volume of water in San Antonio Creek at the time of release. The California red-legged frog should not be adversely affected by the project activities at the other work areas.

We anticipate that if a frac-out occurs in the waterway of San Antonio Creek it would be difficult to contain. The MDA will implement a contingency plan in the event of a frac-out within San Antonio Creek; however, the cleanup efforts may result in increased disturbances of the ground surface, creek banks, channel bed, riparian areas, and instream and/or wetland habitat due to the heavy equipment, machinery, and personnel that would be required to enter the area to contain the bentonite slurry where the frac-out occurred. If the horizontal directional drilling is

Thomas P. DeVenoge (1-8-08-F-10)

18

successful, a frac-out would not occur within San Antonio Creek and the California red-legged frog and unarmored threespine stickleback would not be affected.

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. We are not aware of any other 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, unarmored threespine stickleback, 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 conducting the diverse communications project would not jeopardize the continued existence of the El Segundo blue butterfly, unarmored threespine stickleback or California red-legged frog. We have reached this conclusion because:

1. Implementing the proposed project would only result in temporary adverse effects to the El Segundo blue butterfly, unarmored threespine stickleback, California red-legged frog, and their respective habitats;
2. The MDA will implement a frac-out contingency plan to minimize the effects of a bentonite plume in the event of a frac-out, which should reduce the downstream effects to the California red-legged frog and unarmored threespine stickleback; and
3. The MDA has included measures in the project description to minimize and reduce the adverse effects on the El Segundo blue butterfly, unarmored threespine stickleback, and California red-legged frog.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations promulgated 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 them 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

Thomas P. DeVenoge (1-8-08-F-10)

19

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 the terms and conditions of this incidental take statement.

The measures described below are non-discretionary and must be undertaken by the MDA and the Air Force for the exemption in section 7(o)(2) to apply. The MDA and the Air Force have a continuing duty to regulate the activities covered by this incidental take statement. If the MDA or the Air Force fail to assume and implement the terms and conditions of the incidental take statement, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the MDA or 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 butterflies within the action area would be subject to take in the form of mortality, injury, harm, or harassment. Because of their cryptic nature, fluctuations in abundance from one generation to the next and from one flower head to another, and potentially high parasitism and natural mortality rates (R. Arnold, Entomological Consulting Services, pers. comm. 2007), detecting dead or injured El Segundo blue butterflies as a result of the proposed project would be very difficult. We anticipate that all El Segundo blue butterflies associated with the coast buckwheat plants within the action area would be taken as a result of the proposed project. El Segundo blue butterflies may be taken only within the boundaries of the action area.

All unarmored threespine sticklebacks and California red-legged frogs within the San Antonio Creek project area may be subject to take in the form of mortality, injury, harm or harassment. We cannot predict the exact number of unarmored threespine sticklebacks and California red-legged frogs that would be taken by the proposed action because of the natural fluctuations in numbers that these species experience and the difficulty in determining how many individuals are present at any given time. If a frac-out occurs within San Antonio Creek, we anticipate that all individuals of all life stages of the unarmored threespine stickleback and California red-legged frog could be taken within the area subject to the frac-out plume and the heavy equipment needed to clean up the plume. Unarmored threespine sticklebacks and California red-legged frogs may be taken only within the boundaries of the action area.

This incidental take statement does not exempt any activity from the prohibitions against take contained in section 9 of the Act that is not incidental to the action as described in this biological opinion.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the El Segundo blue butterfly, unarmored threespine stickleback, and California red-legged frog:

Thomas P. DeVenoge (1-8-08-F-10)

20

1. The MDA and Air Force must ensure that the level of incidental take that occurs during project implementation is commensurate with the analysis contained herein.
2. The MDA and Air Force must use well-defined operational procedures and qualified personnel to minimize the incidental take of the El Segundo blue butterfly, unarmored threespine stickleback, and California red-legged frog during project implementation.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the MDA and 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. We assume that the average coast buckwheat contains about 300 flower heads and may produce 30 El Segundo blue butterfly adults. However, the population at VAFB occurs in much less dense numbers than other known populations (Pratt, pers. comm. 2007). Generally, El Segundo blue butterflies are not common anywhere they are observed. If more than two El Segundo blue butterflies are found dead or injured, the Air Force must notify the Ventura Fish and Wildlife Office immediately. We will then review the project activities to determine if additional protective measures are needed. The cause of death or injury must be determined by a Service-approved biologist. Project activities may continue during this review period, provided that all protective measures proposed by the Air Force and the terms and conditions of this biological opinion have been, and continue to be, implemented.
 - b. We are unable to anticipate with certainty the number of unarmored threespine sticklebacks and California red-legged frogs that may be killed or injured if a frac-out occurs within San Antonio Creek. Therefore, the MDA or Air Force must contact us if more than 5 unarmored threespine sticklebacks or 5 California red-legged frogs are found dead or injured. The cause of death or injury must be determined by a Service-approved biologist. Project activities may continue during this review period, provided that all the terms and conditions of this biological opinion have been and continue to be implemented.
2. The following terms and conditions implement reasonable and prudent measure 2:
 - a. Michelle Bates and Heather Moine are hereby authorized to independently survey for, monitor, capture and relocate California red-legged frogs for the purposes of this biological opinion. The MDA or Air Force must request our approval of any other biologist(s) it wishes to survey for, monitor, capture and relocate California

Thomas P. DeVenoge (1-8-08-F-10)

21

red-legged frogs. The request must be in writing and be received by us at least 15 days prior to any such activities being conducted.

Please be advised that possession of a section 10(a)(1)(A) permit for the covered species does not substitute for the implementation of this measure. The authorization provided by a section 10(a)(1)(A) recovery permit is limited to any act otherwise prohibited by section 9 of the Act and conducted for scientific purposes or to enhance the propagation or survival of the affected species. Authorization of Service-approved biologists is valid for this project only.

- b. When capturing and relocating California red-legged frogs from the project area, the Service-approved biologist(s) must minimize the amount of time that animals are held in captivity. During this time, they 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. California red-legged frogs must be captured by hand or dipnet and transported in buckets separate from other species.
- c. 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.
- d. A Service-approved biologist(s) must conduct a training session for all project personnel prior to the onset of any ground-disturbing activities within the action area. At a minimum, this training must include a description of the El Segundo blue butterfly, California red-legged frog, the unarmored threespine stickleback, and their habitats; the general provisions of the Act; the necessity for adhering to the provisions of the Act; the penalties associated with violating the provisions of the Act; the specific measures that are incorporated into the description of the proposed action to avoid and/or minimize the adverse effects to the El Segundo blue butterfly, unarmored threespine stickleback, and California red-legged frog; the areas in which the project activities may be accomplished; and the corrective actions to take in the event of a frac-out within San Antonio Creek.
- e. A Service-approved biologist must be present during the horizontal directional drilling under San Antonio Creek and be in close contact with the operator to be alert to factors that would indicate a potential frac-out. The Service-approved biologist(s) must also have the authority to stop specific work activities until appropriate corrective measures are taken in the event of a frac-out.

Thomas P. DeVenoge (1-8-08-F-10)

22

REPORTING REQUIREMENT

The MDA or the Air Force must provide a report to the Service within 90 days following the completion of the activities covered by this biological opinion. The report must document the number of El Segundo blue butterflies, unarmored threespine sticklebacks, and California red-legged frogs killed or injured during the course of the project; a summary of how the terms and conditions worked; and any suggestions of how these measures could be changed to improve conservation of these species while facilitating compliance with the Act. This document will assist the Service in evaluating terms and conditions for conservation of the El Segundo blue butterfly, unarmored threespine stickleback, and California red-legged frog during future projects.

DISPOSITION OF DEAD OR INJURED SPECIMENS

Upon locating a dead or injured El Segundo blue butterfly, unarmored threespine stickleback, or California red-legged frog, initial notification must be made to the Service's Division of Law Enforcement by facsimile at (310) 328-6399, and the Ventura Fish and Wildlife Office at (805) 644-3958 immediately and in writing 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 treated listed species survive, 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 affects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Air Force should continue conducting El Segundo blue butterfly surveys of any areas at VAFB that contain coast buckwheat to refine our knowledge of the subspecies' distribution.

Thomas P. DeVenoge (1-8-08-F-10)

23

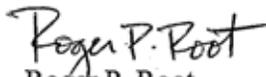
We request notification of the implementation of any conservation recommendations so we may be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species.

REINITIATION NOTICE

This concludes formal consultation on the effects of the MDA's Diverse Communications project 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 and conference 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 and conference opinion; or 4) a new species is listed or critical habitat designated that may be affected by this action (50 CFR 402.16).

If you have any questions regarding this biological opinion, please contact Nic Huber of my staff at (805) 644-1766, extension 249.

Sincerely,



Roger P. Root

Assistant Field Supervisor

Enclosure

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The Declining Amphibian Populations Task Force Fieldwork Code of Practice

- A. Remove mud, snails, algae, and other debris from nets, traps, boots, vehicle tires, and all other surfaces. Rinse cleaned items with sterilized (e.g., boiled or treated) water before leaving each work site.
- B. Boots, nets, traps, and other types of equipment used in the aquatic environment should then be scrubbed with 70 percent ethanol solution and rinsed clean with sterilized water between study sites. Avoid cleaning equipment in the immediate vicinity of a pond, wetland, or riparian area.
- C. In remote locations, clean all equipment with 70 percent ethanol or a bleach solution, and rinse with sterile water upon return to the lab or "base camp" Elsewhere, when washing-machine facilities are available, remove nets from poles and wash in a protective mesh laundry bag with bleach on the "delicates" cycle.
- D. When working at sites with known or suspected disease problems, or when sampling populations of rare or isolated species, wear disposable gloves¹ and change them between handling each animal. Dedicate sets of nets, boots, traps, and other equipment to each site being visited. Clean them as directed above and store separately at the end of each field day.
- E. When amphibians are collected, ensure that animals from different sites are kept separately and take great care to avoid indirect contact (e.g., via handling, reuse of containers) between them or with other captive animals. Isolation from unsterilized plants or soils which have been taken from other sites is also essential. Always use disinfected and disposable husbandry equipment.
- F. Examine collected amphibians for the presence of diseases and parasites soon after capture. Prior to their release or the release of any progeny, amphibians should be quarantined for a period and thoroughly screened for the presence of any potential disease agents.
- G. Used cleaning materials and fluids should be disposed of safely and, if necessary, taken back to the lab for proper disposal. Used disposable gloves should be retained for safe disposal in sealed bags.

The Fieldwork Code of Practice has been produced by the Declining Amphibian Populations Task Force with valuable assistance from Begona Arano, Andrew Cunningham, Tom Langton, Jamie Reaser, and Stan Sessions.

For further information on this Code, or on the Declining Amphibian Populations Task Force, contact John Wilkinson, Biology Department, The Open University, Walton Hall, Milton Keynes, MK7 6AA, UK. E-mail: DAPTF@open.ac.uk Fax: +44 (0) 1908-654167

¹ Latex gloves should not be used. They are toxic to amphibians. Use vinyl or nitrile disposable gloves instead.

APPENDIX B

***STATE HISTORIC PRESERVATION
OFFICER CORRESPONDENCE***

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STATE OF CALIFORNIA – THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, Governor

**OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION**P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov

March 24, 2008

In reply refer to: USAF080222A

Richard N. Cote, P.E.
Deputy Base Civil Engineer
US Department of the Air Force
30th Space Wing (AFSPC)
30 CES/CD
1172 Iceland Avenue
Vandenberg AFB, CA 93437-6012

Re: Missile Defense Agency (MDA) Diverse Communications Project, Vandenberg Air Force Base, Santa Barbara County, California

Dear Mr. Cote:

Thank you for your letter dated 19 February 2008 regarding the referenced undertaking at Vandenberg Air Force Base (VAFB). You are consulting with me in order to comply with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f), as amended, and its implementing regulation at 36 CFR Part 800.

The Missile Defense Agency (MDA), in coordination with the Vandenberg Air Force Base (VAFB) is proposing to install approximately 30,000 linear feet of fiber optic connector lines at six locations on VAFB in an undertaking identified as the MDA Diverse Communications Project. The Air Force has surveyed the project area and has determined that the undertaking, as proposed will not adversely affect historic properties.

After reviewing the materials you submitted along with your letter, including the report *Archaeological Investigations for the Ground-based Mid Course Defense Diverse Communications Fiber Optic Installation on Vandenberg Air Force Base, Santa Barbara, California* (February 2008), I believe that the Air Force has properly determined and documented the Area of Potential Effects (APE) per 36 CFR § 800.4 (a)(1) and that the efforts to identify historic properties within the APE have been appropriate as per 36 CFR § 800.4. Your identification effort found five archaeological sites (CA-SBA-733, -1926, -2696, -3288H, -3527H) within the project vicinity. Sites CA-SBA-1926 and -2696 have been previously determined eligible for inclusion in the National Register through consensus determination. The Air Force is assuming that the remaining three sites are eligible for inclusion in the National Register for the purposes of the undertaking and I have no disagreement with this approach.

Per 36 CFR § 800.5(a), the Air Force has applied the Criteria of Adverse Effect and has determined that the undertaking will have no adverse effect on historic properties. In general, the contributing portions of the sites will be avoided and vehicular travel will be restricted to existing roadways. In areas where existing roads cross sites, vehicular

RICHARD N. COTE, P.E. N
MARCH 24, 2008
2 OF 2

USAF080222A

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crossings will be limited in number and restricted to light vehicles only. Based on a review of the documentation you included with your letter, I agree that a finding of No Adverse Effect is the appropriate finding for the undertaking.

Thank you for considering historic properties as part of your project planning. Please be advised that under certain circumstances, such as unanticipated discovery or a change in project description, the Air Force may have additional future responsibilities for this undertaking under 36 CFR Part 800. If you have any questions or concerns; please contact David Byrd, Project Review Unit historian, at (916) 653-9019 or at dbyrd@parks.ca.gov or Bill Soule, Project Review Unit archaeologist at (916) 654-4614 or at wsoule@parks.ca.gov.

Sincerely,



Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

MWD:db

APPENDIX C

***CALIFORNIA COASTAL COMMISSION
RESPONSE***

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STATE OF CALIFORNIA—THE RESOURCES AGENCY

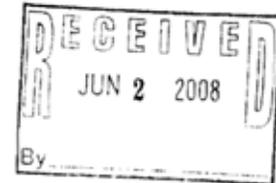
ARNOLD SCHWARZENEGGER, GOVERNOR

CALIFORNIA COASTAL COMMISSION

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



May 28, 2008



Beatrice Kephart
Chief, Environmental Flight
30th Space Wing (AFSPC)
30 CES/CEV
ATTN: Andrew Edwards
1028 Iceland Avenue
Vandenberg AFB, CA 93427-6010

Subject: Negative Determination ND-024-08 (Diverse Communications System, Vandenberg Air Force Base, Santa Barbara Co.)

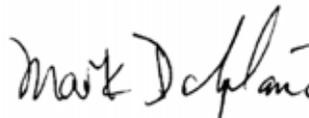
Dear Ms. Kephart:

The Coastal Commission staff has reviewed the above-referenced negative determination. The Air Force proposes to construct a Diverse Communications System which would provide redundancy to and physical separation from the current operational Ground-based Midcourse Defense Communications System at Vandenberg Air Force Base (VAFB). The proposed work includes installation of new communications lines, manholes, and handholes at six general locations on the base. Most trenching installation work would occur along existing paved or gravel roadways and within ten feet of paved roadway edges; approximately 1,500 feet of communication line would be installed in open space between Launch Facility 24 and Launch Facility 23. Sensitive biological resources that occur within project construction corridors will either be avoided or potential adverse effects will be mitigated in accordance with formal Section 7 consultation with the U.S. Fish and Wildlife Service under the Endangered Species Act. Installation work would occur in areas not located along the shoreline or in other scenic coastal areas. The project would not affect public access or recreation as VAFB is closed to public use for military security reasons. The proposed project is similar to a communications system upgrade at VAFB concurred with by the Commission staff in negative determination ND-052-06. That much larger project included the trenching installation of 90 miles of fiber optic cable and the installation of new manholes along existing roads and trails; several segments of cable trenching crossed open space but, as with the proposed project, all of the work occurred well away from the shoreline.

In conclusion, the Commission staff **agrees** that the proposed Diverse Communications System will not adversely affect coastal zone 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.

ND-024-08 (U.S. Air Force)
Page 2

Sincerely,

A handwritten signature in black ink that reads "Mark Douglas". The signature is written in a cursive style.

(f.o.) PETER M. DOUGLAS
Executive Director

cc: CCC – South Central Coast District
California Department of Water Resources
Governor's Washington, D.C., Office