

Final Environmental Assessment

Base Realignment and Closure (BRAC) 2005 Mission Realignments to Vandenberg AFB

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FINDING OF NO SIGNIFICANT IMPACT

Environmental Assessment

Base Realignment and Closure (BRAC) 2005 Mission Realignments to Vandenberg AFB,

Pursuant to provisions of the National Environmental Policy Act (NEPA), 42 U.S. Code 4321 *et seq.*, implementing Council on Environmental Quality (CEQ) regulation, 40 Code of Federal Regulations (CFR) 1500-1508, and 32 CFR Part 989 *Environmental Impact Analysis Process* (EIAP), the U.S. Air Force (Air Force) conducted an assessment of the potential environmental consequences of the Base Realignment and Closure (BRAC) recommendation, which includes the transfer of the existing Defense Satellite Control System (DSCS) missions and Air Force Satellite Control Node Headquarters at Onizuka Air Force Station (AFS) in Sunnyvale, California, to Vandenberg Air Force Base (AFB) in Santa Barbara County, California. To facilitate this transfer, Air Force Space Command (AFSPC) at Peterson AFB, Colorado, proposes the following actions:

- Construction of a new 46,720-square-foot satellite control facility (SCF) and two DSCS terminals at Vandenberg AFB
- Construction of a new electrical substation to provide power to the new SCF facility
- Internal improvements to the existing 22 Satellite Operations Squadron (22nd SOPS) building at the existing Vandenberg Tracking Station (VTS)

In conformance with CEQ Regulations 1502.20 and 1508.28, the environmental planning function at Vandenberg Air Force Base prepared an environmental assessment entitled, *Base Realignment and Closure (BRAC) 2005 Mission Realignments to Vandenberg AFB*. The EA tiers off of the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999). The BRAC EA summarizes issues and mitigation measures which overlap those contained in the 1999 General Plan environmental assessment, incorporating by reference the analysis pertaining to the proposed action and alternatives.

The EA evaluates the potential environmental impacts associated with the Proposed Action and the No-Action Alternative. Project specific analysis and mitigation measures are included in each respective analysis topic as necessary in order to adequately assess the potential impacts of the proposed action.

BACKGROUND

BRAC is a process of the United States federal government directed at the administration and operation of the Armed Forces, used by the United States Department of Defense (DoD) and Congress to close excess military installations and realign the total asset inventory in order to save money on operations and maintenance, aimed at achieving maximum efficiency in line with Congressional and DoD objectives. Realignment of Onizuka AFS was recommended and accepted as part of the 1995 round of the Base Realignment and Closure Program

Among the missions at Onizuka AFS, the Air Force Satellite Control Node and Defense Satellite Control System missions will transfer to Vandenberg Air Force Base, California. In order to accommodate Onizuka's missions at Vandenberg AFB, a new stand-alone facility with secure, reliable and adequate communication connectivity to multiple users is required to conduct continuous second node satellite control functions.

PROPOSED ACTION

The project consists of constructing a new partial single-story and partial two-story SCF at Vandenberg AFB, California. The new SCF facility would be constructed on a vacant approximately 12-acre parcel of land within the Cantonment Area of Vandenberg AFB adjacent to the existing Communications Building (12000) on Washington Avenue. Additionally, internal renovations to the 22nd SOPS building would occur at the existing Vandenberg Tracking Station (VTS) facility. This facility is located approximately 14 miles away from the new SCF location.

The proposed SCF site is located within the Cantonment Area of Vandenberg AFB. The proposed SCF facility would be a 46,720-square-foot slab on grade structure with reinforced concrete foundation, walls of split-ribbed and split-faced concrete masonry units along with exterior finish and insulation system with tinted glass. The roof is to be constructed of sloped, Mission style clay tiles that meet the Vandenberg AFB architectural design standards.

There shall be extensive site preparation and development including site utilities, parking areas with access drives and force protection measures. The project will include a 16-foot high double chain link security fence complete with an Entry Control Facility (ECP) for personnel, a secured motorized gate for vehicles, and surveillance equipment that surrounds the entire SCF Complex. The project will include two new 56-foot diameter terminals that shall be at the back of the complex and face towards the west. Finally, a new electrical substation required to provide power to the facility is also included in the project. The new electrical substation would be located on a separate 3.5-acre parcel approximately 500 yards to the northwest of the SCF facility location.

SUMMARY OF FINDINGS

The analyses of the affected environment and environmental consequences of implementing the Proposed Action and the No-Action Alternative of the Proposed Action concluded that no adverse effects should result to Socioeconomics (3.2), Earth Resources (3.4), Noise (3.8), Traffic (3.9), Hazardous and Solid Waste Management (3.10), Utilities (3.11), and Health and Safety (3.12).

The following areas of environmental consequences evaluated in the EA were determined to have the potential to result in minor impacts:

Land Use

The proposed substation site is located near a closed training and maneuvering area. While the proposed substation site is not located within an identified unexploded ordnance area as defined by the Military Munitions Response Program, 30th Space Wing Safety requires a walk-through survey prior to construction. Prior to the commencement of construction activities on the electrical substation site, an unexploded ordnance survey shall be conducted by 30th Space Wing Safety. Should any unexploded ordnances be identified as a result of the survey, they will be removed and disposed of in accordance with Vandenberg AFB policies.

Cultural Resources

No known sites of cultural or historical significance were identified on any of the sites proposed for development. However, it is recommended that due to the fact that Chumash Indians and later historic peoples were located in the area, there is a possibility that undetected artifacts or features could be present within the project boundaries. If archaeological artifacts are unearthed or exposed during construction, all ground-disturbing work in the vicinity shall stop immediately, and the artifacts and the site shall be evaluated by an experienced archaeologist and a Native American representative. An appropriate plan for the evaluation of the artifacts from the site shall be prepared and its implementation overseen by a qualified archaeologist, prior to the restarting of ground-disturbing work at the project site.

Water Resources

The Proposed Project/Action would disturb a land area of greater than 5 acres. As such, a National Pollutant Discharge Elimination System (NPDES) General Permit is required to protect water resources. The NPDES General Permit requires that a Stormwater Pollution Prevention Plan (SWPPP) that identifies sources of sediment and other pollutants in order to: 1) reduce or eliminate stormwater and non-stormwater discharges associated with construction activities, and 2) minimize impacts to water resources by ensuring water discharged from the construction site meets water quality standards at the point of discharge. All NPDES permit requirements would be implemented to reduce water quality impacts associated with construction activities occurring on the project site.

Air Quality

Development of the proposed project/action would involve site grading, installation of utilities, construction of the proposed new buildings, and post-construction clean up. During this time, onsite stationary sources, heavy-duty construction vehicles, construction worker vehicles, and energy use would generate emissions. In addition, fugitive dust would be generated by site preparation and construction activities. The amount of equipment and number of employees would vary with each construction phase and construction activity depending on the intensity of the action.

A dust abatement program shall be prepared and implemented during all construction activities occurring on the project site. The following measures shall be included in the dust abatement program:

- Sprinkle all construction areas with water (recycled when possible) at least twice a day, during excavation and other ground-preparing operations, to reduce fugitive dust emissions.
- Construction sites shall be watered and all equipment cleaned in the morning and evening to reduce particulate and dust emissions.
- Cover stockpiles of sand, soil, and similar materials, or surround them with windbreaks.
- Cover trucks hauling dirt and debris to reduce spillage onto paved surfaces or have adequate freeboard to prevent spillage.
- Post signs that limit vehicle speeds on unpaved roads and over disturbed soils to 10 miles per hour during construction.
- Soil binders shall be spread on construction sites, on unpaved roads, and on parking areas; ground cover shall be re-established through seeding and watering.
- Sweep up dirt and debris spilled onto paved surfaces immediately to reduce re-suspension of dust through vehicle movement over those surfaces.
- Require the construction contractor to designate a person or persons to oversee the implementation of a comprehensive dust control program and to increase watering, as necessary.

Biological Resources

The only endangered, threatened, or sensitive species noted in the survey of both sites was a population of Gaviota tarplant (*Deinandra increscens* ssp. *villosa*), which was observed along the southeastern berm around the perimeter fencing of the 12000 Building, just to the north of the site for the proposed SCF facility. The location of the Gaviota Tarplant was previously identified in Figure 3.7-1. The location of the population is along the fenceline of the existing 12000 Building. The new SCF building would be constructed to the south of the Gaviota Tarplant population and would not require it to be removed or otherwise impacted. Measures are identified below that would ensure that the existing Gaviota Tarplant population would not be harmed or impacted in any way in association with the proposed project/action.

The low growing grasses and trees located on the project site could provide marginal nesting sites for ground nesting bird species. Therefore, if construction occurs during the nesting season (February – September) the following avoidance, minimization, and management practices will be implemented:

- Prior to start of construction, Vandenberg AFB Natural Resources personnel will inspect the site and surrounding areas to determine if protected birds are nesting within the construction site. If migratory bird nests are detected within the project site, natural resources personnel will confer with the US Fish and Wildlife Service, Migratory Bird Office and secure appropriate approval and permits to relocate or impact nests.

- When and where feasible, sustained heavy equipment operation and haul routes that may disturb nesting birds outside the project site may be routed to minimize disturbance. Buffers of 300 feet for ground nesting bird nests and 500 feet for raptor nests should be maintained when and where feasible.
- If during construction, dead or injured birds or destroyed nests are observed in the project site, ground disturbing activities shall cease and the contractor will notify Vandenberg AFB natural resources personnel for appropriate disposition and re-assessment of activities.

FINDING OF NO SIGNIFICANT IMPACT

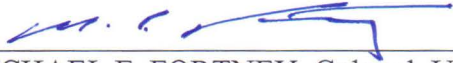
Based on our review and analyses contained in the attached EA, conducted in accordance with NEPA and CEQ regulations, we conclude that the Proposed Action should not have any significant environmental impact, whether by itself or cumulatively with other ongoing projects at Vandenberg AFB. Accordingly, an Environmental Impact Statement is not required. The signing of the Finding of No Significant Impact completes the Environmental Impact Analysis Process.

**FINDING OF NO SIGNIFICANT IMPACT
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Environmental Assessment

Base Realignment and Closure (BRAC) 2005 Mission Realignments to Vandenberg AFB

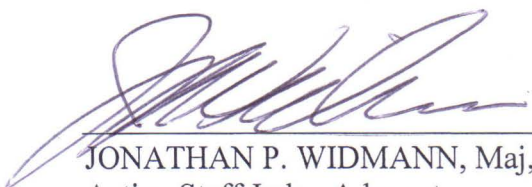
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MICHAEL E. FORTNEY, Colonel, USAF
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22 Jun 07

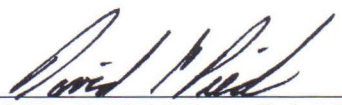
Judge Advocate Approval



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1.1 BACKGROUND

The National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations require a lead agency to prepare an Environmental Assessment (EA) to evaluate the potential impacts of Federal actions on the surrounding environment. The United States Air Force (Air Force) is the lead agency for NEPA compliance on this proposed project and, as such, is the final decision-maker.

As part of a Base Realignment and Closure (BRAC) recommendation, the existing Defense Satellite Control System (DSCS) missions and Air Force Satellite Control Node Headquarters at Onizuka Air Force Station (AFS) in Sunnyvale, California, would be transferred to Vandenberg Air Force Base (AFB) in Santa Barbara County, California (Figure 1-1). To facilitate this transfer, Air Force Space Command (AFSPC) at Peterson AFB in Colorado is proposing the following actions as a part of the proposed action to facilitate this move:

- Construction of a new 46,720-square-foot satellite control facility (SCF) and two DSCS terminals at Vandenberg AFB
- Construction of a new electrical substation to provide power to the new SCF facility
- Internal improvements to the existing 22 Satellite Operations Squadron (22nd SOPS) building at the existing Vandenberg Tracking Station (VTS)

This EA evaluates the potential adverse environmental impacts associated with the Proposed Action and the No-Action Alternative of the Proposed Action. This EA has been prepared in accordance with the following laws and regulations:

- NEPA of 1969, as amended [Title 42 U.S. Code (USC) 4321 *et seq.*] and implemented by CEQ Regulations [Title 40 Code of Federal Regulations (CFR) Parts 1500 through 1508]
- Air Force Instruction (AFI) 32-7061, Environmental Impact Analysis Process (EIAP), as amended by the interim change dated March 12, 2003, which adopted 32 CFR Part 989

In conformance with CEQ Regulations 1502.20 and 1508.28, this EA is tiered to *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999) in order to eliminate repetitive discussions of issues previously addressed. As such, this EA summarizes issues and mitigation measures which overlap those contained in the Cantonment EA. Project specific analysis and mitigation measures are included in each respective analysis topic as necessary in order to adequately assess the potential impacts of the proposed action.

Vandenberg AFB is headquarters for the 30th Space Wing. The Air Force's primary missions at Vandenberg AFB are to launch and track satellites in space, test and evaluate America's

intercontinental ballistic missile systems, and support aircraft operations in the Western Range.¹ As a non-military facet of operations, Vandenberg AFB is also committed to promoting commercial space launch ventures.

Vandenberg AFB is located on the south-central coast of California, approximately halfway between San Diego and San Francisco. Figure 1-1, Vicinity Map, shows the location of Vandenberg AFB in the Central Coast of California. Vandenberg AFB covers 99,492 acres in western Santa Barbara County and occurs in a transitional ecological region that includes the northern and southern distributional limits for many plant and animal species. The Santa Ynez River and State Highway 246 divide Vandenberg AFB into two, distinct parts – North Base and South Base.

1.2 PROPOSED ACTION

The project consists of constructing a new partial single-story and partial two-story Satellite Control Facility at Vandenberg AFB, California. The new SCF facility would be constructed on a vacant approximately 12-acre parcel of land within the Cantonment Area of Vandenberg AFB adjacent to the existing Communications Building (12000) on Washington Avenue. Internal renovations to the 22nd SOPS building would occur at the existing Vandenberg Tracking Station (VTS) facility. This facility is located approximately 14 miles away from the new SCF location.

The proposed SCF site is located within the Cantonment Area of Vandenberg AFB. The proposed SCF facility would be a 46,720-square-foot slab on grade structure with reinforced concrete foundation, walls of split-ribbed and split-faced concrete masonry units along with exterior finish and insulation system with tinted glass. The roof is to be constructed of sloped, Mission style clay tiles that meet the Vandenberg AFB architectural design standards.

There shall be extensive site preparation and development including site utilities, parking areas with access drives and force protection measures. The project will include a 16-foot high double chain link security fence complete with an Entry Control Facility (ECP) for personnel, a secured motorized gate for vehicles, and surveillance equipment that surrounds the entire SCF Complex. The project will include two new 56-foot diameter terminals that shall be at the back of the complex and face towards the west. Finally, a new electrical substation required to provide power to the facility is also included in the project. The new electrical substation would be located on a separate 3.5-acre parcel approximately 500 yards to the northwest of the SCF facility location.

¹ The Western Range is a vast tracking, telemetry, and command complex whose boundary begins along Vandenberg AFB's coastline and extends westward across the Pacific Ocean. The range consists of electronic and optical tracking systems located along the Pacific Coast that collect and process launch-related data for a variety of users.

FIGURE 1-1
REGIONAL LOCATION MAP
IN PREP

1.3 PURPOSE AND NEED FOR THE PROPOSED ACTION

Construction of all of the components of the proposed action will facilitate the move of the resources from Onizuka Air Force Base to Vandenberg AFB consistent with the Congressional BRAC recommendations. The primary goal of the project is to comply with BRAC law by realigning missions to Vandenberg Air Force Base.

1.4 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This EA describes and addresses the potential environmental impacts resulting from implementation of the Proposed Action to construct a new SCF and install two antenna terminals on a vacant parcel of the VAFB Cantonment Area and to renovate of a portion of the existing Vandenberg Tracking Station (VTS) facility located approximately 14 miles away from the new SCF location. This EA also evaluates the potential environmental impacts of the No-action Alternative. Other alternative sites within the cantonment area of VAFB were considered for the SCF facility but rejected during the preparation of the Requirements Document and associated design charrette.

1.5 ALTERNATIVES CONSIDERED BUT ELIMINATED

Consistent with Air Force Instruction (AFI) 32-7061 and CEQ regulations, the scope of analysis presented in this EA is defined by the potential range of environmental impacts resulting from the implementation of the Proposed Action and the No-action Alternative. Other alternatives to the Proposed Project/Action such as reducing the size of the SCF building were considered but rejected. A reducing the size of the floor area associated with the SCF building would not support all of the resources that would be moved to Vandenberg AFB. For this reason, a reduced SCF building was not considered in this EA.

Resources potentially impacted are considered in more detail in order to determine whether additional analysis is required pursuant to 40 CFR Part 1501.4(c). The resources analyzed in this EA include the following topics as tiered from the Cantonment EA:

- Land Use
- Socioeconomics
- Cultural Resources
- Earth Resources
- Water Resources
- Air Quality
- Biological Resources

- Noise
- Transportation
- Hazardous and Solid Waste Management
- Utilities
- Health and Safety

1.6 ORGANIZATION OF THE ENVIRONMENTAL ASSESSMENT

This EA is organized in the following sections and appendices:

- Section 1.0 is an introduction to the EA and includes the purpose of and need for the Proposed Action.
- Section 2.0 provides a description of the Proposed Action and the No-action Alternative.
- Sections 3.0 and 4.0 discuss the affected environment and the environmental consequences of implementing the Proposed Action and the No-action Alternative, respectively. Resource areas analyzed in this EA are listed in Section 1.4.
- Sections 5.0 through 8.0 contain the following, respectively:
 - List of agencies and persons consulted
 - Bibliography
 - List of preparers
 - Acronyms and abbreviations

DESCRIPTION OF PROPOSED ACTION AND NO ACTION ALTERNATIVE

SECTION 2.0

This chapter describes the Proposed Action and the No-action Alternative for the constructing a new, stand-alone satellite control facility and related structures, and renovating the 22nd SOPS Backup Scheduling facility at the existing VTS. The SCF is located in the Cantonment Area and is shown on Figure 2-1. The VTS site is located 14 miles from the SCF and is shown on Figure 2-2. Interior renovations typically do not require environmental analysis and are Categorically Excluded from further NEPA analysis (CEQ Regulation 23 CFR 771.117). However, because the Proposed Action is a result of a BRAC recommendation to relocate AFSCN and DSCS missions from Onizuka Air Station to Vandenberg AFB, the renovation portion of the 22nd SOPS facility is addressed in the description of the proposed action.

2.1 PROPOSED ACTION

As outlined below, the Proposed Action consists of constructing the AFSCN 2nd Node facility and related structures, and 22nd SOPS Backup Scheduling facility and related structures. The new SCF facility would be constructed on a vacant approximately 12-acre parcel of land within the Cantonment Area of Vandenberg AFB adjacent to the existing Communications Building (12000) on Washington Avenue. The proposed SCF facility would be a 46,720-square-foot slab on grade structure with reinforced concrete foundation, walls of split-ribbed and split-faced concrete masonry units along with exterior finish and insulation system with tinted glass. A new electrical substation required to provide power to the facility is also included as a part of the Proposed Action. The new electrical substation would be located on a separate 3.5-acre parcel approximately 500 yards to the northwest of the SCF facility location.

Internal renovations to the 22nd SOPS building would occur at the existing Vandenberg Tracking Station (VTS) facility. This facility is located approximately 14 miles away from the new SCF location. The 22nd SOPS Backup Scheduling facility would primarily involve renovating the interiors of two rooms in the VTS. In addition, associated power and other utility corridors would be constructed on the outside of the VTS; in turn, these utility lines would be connected to the facility via utility line junctures on the exterior walls of the VTS.

2.2 PROJECT DESCRIPTION

The project consists of constructing a new partial single-story and partial two-story SCF building at Vandenberg AFB. This project includes new construction on a vacant 4-acre parcel at Vandenberg AFB and renovation of a portion of the existing Vandenberg Tracking Station (VTS) facility located approximately 14 miles away from the new SCF location. Figure 2-3, SCF Site Plan, identifies the proposed location of the new facility adjacent to the existing Communications Building (12000) on Washington Avenue.

FIGURE 2-1

SCF PROJECT LOCATION

FIGURE 2-2

VTs PROJECT LOCATION

**FIGURE 2-3
PLOT PLAN FOR SCF**

DESCRIPTION OF PROPOSED ACTION AND NO ACTION ALTERNATIVE

SECTION 2.0

Figure 2-4, Enlarged Site Plan, shows the proposed layout of the SCF facility and related structures. The proposed SCF facility is proposed as a 4,340-square-meters (sm) (46,720-square-foot [sf]) slab on grade with reinforced concrete foundation, walls of split-ribbed and split-faced concrete masonry units along with exterior finish and insulation system with tinted glass. The roof shall be a sloped roof with Mission clay style tiles that are consistent with Vandenberg AFB architectural design standards. The facility would have redundant mechanical and electrical systems that meet Tier 3, or concurrently maintainable site infrastructure with a preferred and alternate source, design standards.

Figures 2-5 and 2-6, SCF Facility Elevations, show the north, south, east, and west elevations of the proposed facility. The SCF is proposed as a two-story administrative type facility with the majority of floor space placed on raised access flooring. The main southwest entrance of the SCF will incorporate a lobby that is large enough to accommodate a reception and security checkpoint area. The lobby is designed to clearly direct visitors and customers coming to the facility as well as accommodate the end-users on a daily basis.

There will be extensive site preparation and development including site utilities, parking areas with access drives and force protection measures. The project will include a 16-foot high double chain link security fence complete with an Entry Control Facility (ECF) for personnel, a secured motorized gate for vehicles, and surveillance equipment that surrounds the entire SCF Complex. The project will include two new 56-foot diameter terminals that would be at the back of the complex and face towards the west.

2.2.1 Construction Schedule

The approximate completion date for all phases of development associated with the proposed action is expected to occur no earlier than 2009. The construction for all actions associated with the project would be completed over an 18-month period. The construction start date depends upon the completion of all design specifications and the ultimate project approval by the Air Force. Rough grading of the project site will be completed in approximately 2 months.

2.2.2 Utilities

2.2.2.1 Electrical

A new electrical substation required to provide power to the facility is also included in the project. The new substation facility is proposed to be located at the northwest corner of Airfield Road and Washington Avenue, approximately 500 feet from the SCF facility. The substation will be tied into an existing 70 kilovolt (kV) electrical line paralleling Airfield Road and will step down to a 12 kV line. The new 12 kV line will be aerial and will travel

FIGURE 2-4
DETAILED PLOT PLAN

**FIGURE 2-5
FACILITY ELEVATION**

**FIGURE 2-6
FACILITY ELEVATION**

DESCRIPTION OF PROPOSED ACTION AND NO ACTION ALTERNATIVE

SECTION 2.0

parallel to Airfield Road on the northwest side in the southwest direction for approximately 950 feet. At this point the 12 kV line will cross over Airfield Road and parallel an existing 12 kV line on separate poles in a southeast direction for approximately 1,000 feet. From this point the new 12 kV line will be connected directly to the new SCF building.

There will be an area outside of the SCF to house the four 2 MW generators, the two generator paralleling switchgear, and the two main building switchgear. The generators will provide back-up power to the SCF as described above. Each switchgear (normal or standby power) would include a multifunction digital metering package and transient voltage surge suppressor.

All exterior equipment would be mounted on individual concrete pads, so that the distance between equipment items is no less than 10 feet, and the personal egress space around pad-mounted equipment is no less than 40 inches.

2.2.2.2 Communications

There is an existing underground communication network paralleling Washington Avenue on the west side. Approximately 450 linear feet of new underground communications service would be provided to the new SCF.

2.2.2.3 Natural Gas

There is an existing underground natural gas line paralleling Washington Avenue on the west side. Approximately 550 linear feet of new underground gas service would be provided to the new SCF. The new underground service would be consistent with the existing materials currently being used and would employ the use of seismic shutoff valves in accordance with local codes.

2.2.2.4 Water Supply

There is an existing underground six-inch potable water main that loops around Building 12000 approximately 300 linear feet north of the new project site. Approximately 300 linear feet of new service would be provided to the new SCF. A backup potable water source is required for the new SCF. There is an existing underground 6-inch potable water main paralleling Washington Avenue approximately 310 feet on the east side. This line is suspected to be abandoned, and approximately 1,500 linear feet of it would need to be repaired, and approximately 900 linear feet of new service line will be provided to use it as a backup potable water source.

DESCRIPTION OF PROPOSED ACTION AND NO ACTION ALTERNATIVE

SECTION 2.0

2.2.2.5 Sanitary Sewer

There is an existing underground 21-inch sanitary sewer line paralleling Washington Avenue approximately 30 feet on the east side. Approximately 760 linear feet of new sanitary sewer service will need to be provided to the closest sanitary sewer manhole for the new SCF.

2.2.2.6 Stormwater

An underground storm water drainage system does not exist near the proposed site location of the new SCF. Building 12000 to the north of the proposed project site uses a series of inlets and pipes to collect the storm runoff and discharges downhill from the site. A similar system will be used for the new SCF unless new best management practices (BMP's) are adopted by Vandenberg AFB prior to the construction of the new Complex. Approximately 450 linear feet of reinforced concrete pipe (RCP) will be used for storm sewer system for the new SCF.

2.3 ALTERNATIVES TO THE PROPOSED ACTION

2.3.1 No-action Alternative

The No-action Alternative consists of the circumstances that would occur if the Proposed Action were not implemented. The DSCS and SCF facilities currently residing at Onizuka AFS would not be transferred to Vandenberg AFB. Consequently, the new SCF facility, related structures and new electrical substation would not be constructed. Additionally, internal improvements to the existing 22nd SOPS facility would not be required.

This document is a tiered EA addressing the potential affects of the BRAC realignment actions on Vandenberg Air Force Base (proposed project/action). This document is tiered from for the Cantonment Area EA, which includes the site locations for the proposed project/action. The affected environment discussion utilizes existing condition information contained in the Cantonment EA as the basis to compare the effects of the proposed project/action. To the extent required under NEPA, additional information is included in order to update the existing condition information for each of the issue areas discussed in this section including the following:

- Land Use
- Socioeconomics
- Cultural Resources
- Earth Resources
- Water Resources
- Air Quality
- Biological Resources
- Noise
- Traffic
- Hazardous Materials
- Utilities
- Health and Safety

For other issue areas not included above, it is assumed that the analysis of impacts contained in the Cantonment EA is sufficient for the purposes of this tiered EA.

3.1 LAND USE

The land use setting for the project sites associated with the proposed project/action is tiered from information contained in the Programmatic EA prepared for the Cantonment Area. For a complete discussion regarding the land use setting identified for the Cantonment Area please refer to the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999). As applicable, additional information has been incorporated into this section to supplement and update the existing conditions information as it relates to the project sites associated with the proposed project/action.

3.1.1 Regional Land Use

Vandenberg AFB is located on the Central Coast of California about 150 miles northwest of Los Angeles and 275 miles south of San Francisco. The cities of Santa Maria and Lompoc are located within 10 miles of the base to the northwest and northeast, respectively, while the City of Santa Barbara is located 50 miles to the east-southeast. With the exception of these communities, land use in the vicinity of the base is utilized in low intensity activities, primarily agriculture.

Vandenberg AFB has the largest area of relatively undisturbed central coast habitat in California. The based consists of 98,400 acres of land, including 35 miles of coastline associated with the Pacific Ocean. Less than 15 percent of the total base land area is disturbed.

The land use pattern at Vandenberg AFB varies from a dense core of residential, industrial, and administrative activities in the Cantonment Area to widely dispersed launch, test, and tracking facilities throughout the remainder of the base. Open space that is either undeveloped or used for low intensity activities, such as recreation, is a major component of the land use pattern. Development on the base is presently regulated through the Base Comprehensive Plan adopted in 2004, various USAF safety regulations, and state and federal regulations aimed at preserving cultural sites and environmentally sensitive areas.

3.1.2 Cantonment Area Land Use

Land use in the Cantonment area is, in part, a result of the historical development of the area. The U.S. Army purchased most of the site in 1941 for use as a training center. The installation, Camp Cooke, named in honor of Major General Philip St. George Cooke, was activated later that year. Faint vestiges of Camp Cooke, including the old street pattern, are still evident. Newer elements of the Cantonment Area are located around the old installation as new activities and buildings replaced the older elements of the base. In the 1950s, with the advent of the missile age, approximately 64,000 acres of North Camp Cooke was transferred to the Air Force for use as a missile training facility. On October 4, 1958, Cooke AFB was

renamed Vandenberg AFB in honor of the late General Hoyt S. Vandenberg, the Air Forces' second Chief of Staff.

The Cantonment Area General Plan encompasses 4,872 acres within Vandenberg AFB. The land use pattern for the Cantonment Area is based on functional relationships, locating compatible activities near each other and separating incompatible uses and activities. For example, the accompanied personnel housing is located close to day care facilities, but set away from industrial activities operating in the area. Unaccompanied personnel housing, by contrast, is more centrally located in areas containing workplaces and recreation activities in recognition of the fact that unaccompanied personnel might not have access to vehicles.

Land Use within the Cantonment Area is divided into four general zoning classifications; housing, community service, administrative, and industrial. The following discussion briefly describes the land use and operations that occur within each of the four general zoning classifications.

3.1.2.1 Housing Zones

The Housing Zones within the Cantonment Area include family housing, airmen dormitories, visiting officers' quarters, and visiting airmen's quarters. Other compatible uses may be included in this area such as religious, day care, convenience center, education, community center, and recreational facilities. The accompanied housing area consists of the Capehart Housing area, East Housing, and a trailer park.

3.1.2.2 Community Service Zones

The purpose the Community Service Zone is to provide a consolidated area for community service and commercial-type activities for use by base residents and workers. The intent is to encourage a well-designed, centralized setting that facilitates community activities, fosters pedestrian accessibility, enhances a sense of community, and increases the Vandenberg AFB population's quality of life. The following facilities are located in the Community Service Zone: the Base Exchange, commissary, cafeterias, bank facilities, post offices, library, theaters, schools, hospital, bowling alley, retail stores, clothing stores, collocated club, laundromat, POV gas station, thrift shop, and day care facilities.

3.1.2.3 Administrative Zones

The purpose of the Administrative Zone is to accommodate administrative, training, and office-related activities. It is the intent that the Administrative Zone will be well-designed and landscaped so as to be harmonious with surrounding land uses. The types of activities that are located in the Administrative Zone include: command and headquarter facilities, offices, training, classrooms, auditorium facilities, design, engineering, computer facilities, launch control facilities, and support functions for any of the above activities.

3.1.2.4 Industrial Zones

The purpose of the Industrial Zone is to provide areas where production, maintenance, and storage activities can be located. It is the intent to encourage sound industrial development by creating appropriate areas for these uses and to protect nearby administrative, community service, and recreational uses from heavy traffic, noise, and other disturbances. Several development constraint areas particularly relevant to the Industrial Zone include:

- Areas of Potential Unexploded Ordnances
- Explosive Safety Zones
- Installation Restoration Program (IRP) Sites
- Microwave Line of Sight Delineation
- Operational Toxic Hazard Zones
- Strategic Arms Reduction Treaty Inspectable Areas
- Endangered, Threatened, and Sensitive Species and Associated Habitats
- Wetlands

Other areas that are not located within one of the four zoning classification areas discussed above are located in open space areas or passive recreation areas. The sites for the proposed project/action are presently located within open spaces areas within the Cantonment Area.

Another important land use zone in the Cantonment Area is the airfield. The original airfield facilities were constructed in 1959 and included an 8,000-foot runway, a parallel taxiway, and a parking apron. The entire runway was reconstructed and lengthened to 15,000 feet in 1983 in anticipation of space shuttle landings at Vandenberg AFB. A critical land use relationship involves the airfield, open space, and maintaining clear zones and imaginary airspace surfaces. Areas of land adjacent to the paved sections of the airfield must remain free of obstructions as well as approach slopes and a 3,000-foot by 3,000-foot area off the end of the runway.

3.10 HAZARDOUS AND SOLID WASTE MANAGEMENT

The hazardous and solid waste management information for the project sites associated with the proposed project/action is tiered from information contained in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion of the hazardous and solid waste management setting for the Cantonment Area. As applicable, additional information has been incorporated into this section to supplement and update the existing conditions information as it relates to the project sites associated with the proposed project/action.

The baseline information presented in this section is based primarily on a Phase I Environmental Site Assessment (ESA) of the Satellite Control Facility Site prepared in December 2005 (URS, 2005), and information and interviews provided by VAFB.

Definitions of hazardous materials and hazardous waste follow:

- **Hazardous Material:** Any material that because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, and any material which a handler or the administering regulatory agency has a reasonable basis for believing would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment. A number of properties may cause a substance to be considered hazardous, including toxicity, ignitability, corrosivity, or reactivity.
- **Hazardous Waste:** A waste or combination of waste which because of its quantity, concentration, or physical, chemical, or infection characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitation-reversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of or otherwise managed (Title 22, California Code of Regulations, Section 66084). The term hazardous waste includes extremely hazardous waste and acutely hazardous waste.

3.10.1 Hazardous Materials Management

Vandenberg AFB uses and stores numerous hazardous materials in support of its mission. These materials range from highly explosive and toxic rocket fuels, to more common and less toxic materials such as cleaners and paints. Vandenberg AFB implements a Hazardous Materials Management Plan which provides policy and guidance regarding the management of hazardous materials on base, and ensures compliance with federal, state, local, and Air Force requirements. The Plan includes the Hazardous Materials Management System, the

Hazmart Pharmacy Program, Hazardous Materials Storage, Hazardous Materials Business Plans, the Risk Management Program, and Polychlorinated Biphenyl (PCB) Management.

There are no hazardous materials used or stored on the Proposed Project Area.

3.10.2 Hazardous Waste Management

Vandenberg AFB is a large quantity generator of hazardous waste. The U.S. Environmental Protection Agency (EPA), Resource Conservation and Recovery Act (RCRA) sets regulations regarding generation, storage, and transportation of hazardous waste. The California Department of Toxic Substance Control (DTSC) regulations regarding hazardous waste are contained in the California Code of Regulations, Title 26.

Vandenberg AFB Hazardous Waste Management Plan outlines procedures to be followed for hazardous waste management and disposal. The Plan requires hazardous waste to be removed from generating sites by a licensed hazardous waste transporter. Transported materials must be shipped with a hazardous waste manifest. The manifest system tracks the waste from generation to treatment or disposal.

Hazardous waste is not generated or stored on the Project Area.

3.10.3 Installation Restoration Program

The Installation Restoration Program (IRP) is implemented by the Department of Defense (DOD) through the Defense Environmental Restoration Program (DERP). DERP funding is used to clean up past disposal and spill sites on federal military installations nationwide. Hazardous release investigations conducted under the IRP are DERP-funded actions. These investigations have identified the following:

- IRP sites, where proof exists of hazardous material releases to the environment
- Areas of Concern (AOCs), where potential hazardous materials releases are suspected
- Areas of Interest (AOIs), defined as an area with the potential for use and/or presence of a hazardous substance

Chemicals of potential concern (COPCs) are hazardous materials or wastes that may be associated with past site activities. They differ from site to site and depend upon activities in the area.

There are no IRP sites located on the property. Two IRP sites are located near the subject property. These sites are reported to be closed.

3.10.4 Solid Waste

The Vandenberg AFB Class III Landfill currently occupies approximately 187 acres. Vandenberg AFB handles solid waste in accordance with the conditions of the Solid Waste Management Plan. In addition, the base landfill is operates pursuant to the Solid Waste Facility Permit (SWFP) #42-AA-0012 issued to the Air Force on November 15, 1994 by the Santa Barbara County Environmental Health Services Department. The permit currently allows the Vandenberg AFB landfill to accept a daily maximum of 400 tons of waste, while maintaining a 50 ton per day average. The landfill is also operating pursuant to Waste Discharge Requirement (WDR) order No. 94-26 issued by the California Regional Water Quality Control Board on June 3, 1994. The average daily volume of solid waste received at the landfill is 30 to 60 tons. According to the latest information identified on the California Integrated Waste Management Board Website, the Vandenberg AFB landfill has a permitted capacity of 3.1 million cubic yards. The landfill has a remaining capacity of 2.4 million cubic yards and is expected to remain operational until 2084.

3.11 UTILITIES

The utilities information for the project sites associated with the proposed project/action is tiered from information contained in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the utilities setting for the Cantonment Area. As applicable, additional information has been incorporated into this section to supplement and update the existing conditions information as it relates to the project sites associated with the proposed project/action.

3.11.1 Electrical Power

Vandenberg AFB receives electrical power from Pacific Gas and Electric (PG&E). Major improvements to the electrical system commenced in the early 1980s. The existing electrical system can accommodate a substantial increase in demand for electrical power.

There is an existing 70 kilovolt (kV) aerial electrical line paralleling Airfield Road approximately 160 linear feet (lf) to the northwest of the Proposed Project Area. The Proposed Project will require a new dedicated substation placed at the northwest corner of the intersection of Airfield Road and Washington Avenue. The substation will be tied into the 70 kV line and will step down power to 12 kV. The new 12 kV line will be aerial and will travel parallel to Airfield Road on the northwest in the southwest direction for approximately 950 lf. The 12 kV line will cross over Airfield Road and parallel an existing 12 kV feeder on separate poles in the southwest direction for approximately 1,020 lf. The 12 kV power feed is expected to go underground at this point outside the perimeter security fencing for the Proposed Project. Approximately 250 lf on new underground electrical service is needed for the Proposed Project.

3.11.2 Natural Gas

Natural gas is supplied to Vandenberg AFB by the Southern California Gas Company. The natural gas system easily meets all current needs and could be expanded by 60 percent above the present demands.

There is an existing underground natural gas line paralleling Washington Avenue on the west side. Approximately 550 lf of new underground gas service will be provided to the Proposed Project.

3.11.3 Communications

Communications infrastructure at Vandenberg AFB includes 2,777 sheath miles of base-owned cable. These cables are copper or optical fiber and are a mix of aerial, direct buried, and underground installations. Phone service to the base housing areas is provided by GTE.

There are many other privately operated communication systems within the base. Microwave communication, which requires line of sight transmission, is an important aspect of the communication systems of Vandenberg AFB.

There is an existing underground communication network paralleling Washington Avenue on the west side. Approximately 450 lf of new underground communication service will be provided to the Proposed Project.

3.11.4 Water

Water is supplied to Vandenberg AFB by the Coastal Branch Aqueduct of the State Water Project. The Cantonment water supply is supplemented in times of peak demand by wells from the San Antonio Creek Basin. The existing water supply meets current demands and should be able to accommodate a substantial expansion of Cantonment area activities.

There is an existing underground six-inch potable water main that loops around Building 12000 approximately 300 lf north of the Proposed Project Area. Approximately 300 lf of new service will be provided for the Proposed Project. A backup potable water source is required for the Proposed Project. There is an exiting underground six-inch potable water main paralleling Washington Avenue approximately 310 feet on the east side. This line is suspected to be abandoned, and approximately 1,500 lf of it would need to be repaired and approximately 900 lf of new service line will be provided to use as a backup potable water source.

3.11.5 Sanitary Sewer System

Most sewage from the Cantonment Area is transferred by pipeline to the Regional Wastewater Reclamation Plant. The Lompoc Regional Wastewater Reclamation Plant currently treats approximately 4 million gallons per day (MGD) of effluent, but has the capacity to treat 10 MGD, indicating that the facility can handle expansion of the Cantonment area facilities.

There is an existing underground 21-inch sanitary sewer line paralleling Washington Avenue approximately 30 feet on the east side. Approximately 760 lf of new sanitary sewer service will need to be provided to the closest sanitary sewer manhole for the Proposed Project.

3.11.6 Storm Drainage System

Stormwater runoff in the Cantonment area is gravity flow directed by surface topography, open drainage swales, and/or underground structures. Vandenberg AFB does not currently have a stormwater drainage plan, and the existing facilities cannot adequately deal with excessive runoff. Minor localized flooding can occur during periods of very heavy rainfall.

An underground storm water drainage system does not exist near the Proposed Project Area. Building 12000 to the north of the Proposed Project uses a series of inlet and pipes to collect the storm runoff and discharges downhill from the site. A similar system will be used for the Proposed Project unless new Best Management Practices (BMPs) are adopted by Vandenberg AFB prior to construction of the Proposed Project. Approximately 450 lf of reinforced concrete pipe will be used for the storm water system for the Proposed Project.

3.12 HEALTH AND SAFETY

The health and safety information for the project sites associated with the proposed project/action is tiered from information contained in the Programmatic EA prepared for the Cantonment Area. For a complete discussion regarding the health and safety setting identified for the Cantonment Area please refer to the Cantonment EA. As applicable, additional information has been incorporated into this section to supplement and update the existing conditions information as it relates to the project sites associated with the proposed project/action.

All construction activities, facility operations, and maintenance on Vandenberg AFB are subject to the requirements of the federal Occupational Safety and Health Act (OSHA), California OSHA, Air Force Occupational Safety and Health (AFOSH), and other recognized standards, and applicable Air Force regulations or instructions.

Relevant health and safety requirements include industrial hygiene and ground safety. Industrial hygiene is the joint responsibility of Bioenvironmental Engineering, 30 SW Safety, and contractor safety departments. Responsibilities include monitoring of exposure to workplace chemicals and physical hazards, hearing and respiratory protection, medical monitoring of workers subject to chemical exposures, and oversight of all hazardous or potentially hazardous operations. Ground safety includes protection from hazardous situation and hazardous materials. If personal protective equipment must be used, 30 SW Safety requires a general description of the commodity in use; the hazardous qualities of the material; and data showing compliance with allowable limits for workplace exposures, workplace emergencies, and public exposures.

Many areas on Vandenberg AFB were used as ordnance training ranges. As a result, there are remnants of unexploded ordnance (UXO) in recognized areas of the base. UXO from these areas may be detonated by only a slight movement, resulting in an explosion, burning, or release of smoke. Special precautions need to be taken in known areas of Vandenberg AFB that were used as practice ranges for artillery firing, referred to as Explosive Ordnance Disposal (EOD) Zones.

3.12.1 Site Health and Safety

The Proposed Project Area has the following health and safety issues:

- Physical hazards, including holes or ditches, uneven terrain, sharp or protruding objects (i.e., from vegetation)
- Biological hazards, including insects, spiders, snakes, rodents and ticks

3.2 SOCIOECONOMICS

The socioeconomic information included in this section is tiered from data contained in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999). For a complete discussion regarding socioeconomic information identified for the Cantonment Area, please refer to this document. As applicable, additional information has been incorporated into this section to supplement and update the existing conditions information as it relates to the project sites associated with the proposed project/action.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, was issued on February 11, 1994. The Executive Order requires each federal agency to take the appropriate and necessary steps to identify and avoid “disproportionately high and adverse” effects of federal projects on the health or environment of minority and low-income populations. The U.S Air Force, as a federal agency, is charged with the responsibility of implementing this executive order.

Identifying disproportionately high and adverse effects means determining that the impact is appreciably more severe or greater in magnitude on minority or low-income populations than the adverse effect suffered by the non-minority or non-low-income populations after taking offsetting benefits into account. According to Executive Order 12898, a minority population means: 1) any readily identifiable group of minority persons who live in geographic proximity; and 2) if circumstances warrant, geographically dispersed/transient persons, such as migrant workers or Native Americans, who would be similarly affected by a proposed FHWA program, policy, or activity.

No formal, commonly accepted significance criteria have been adopted for Environmental Justice impacts. However, the Presidential Memorandum accompanying the EO directs federal agencies to include measures to avoid disproportionately high and adverse environmental effects of the proposed Federal actions on minority and low-income populations. Federal agencies also are required to give affected communities opportunities to provide input into the environmental review process, including identification of avoidance, minimization, and management practices.

3.2.1 Regional Setting

Vandenberg AFB is located in the western portion of Santa Barbara County, approximately 10 miles north of the City of Lompoc. The County consists of a number of cities, for this analysis, only the nearby cities of Lompoc, Santa Maria, and unincorporated portions of the County are considered. These areas are analyzed as they have the greatest potential for impact due to their proximity to Vandenberg AFB. In effect, the existence of Vandenberg AFB has impacted these areas over time, mainly in regards to beneficial economic impacts

(i.e., civilian job opportunities, etc). For the purpose of this analysis both cities and the county is analyzed with respect to population, housing, employment, and schools.

3.2.1.1 Population

Santa Barbara County's population in 2002 was estimated to be 407,900 (California Department of Finance, 2006). This corresponds to a 1.2 percent annual average increase from 2001. For the City of Lompoc the U.S. Census Bureau estimated a population of 41,167 in 2003 with a 0.2 percent increase from 2000 to 2003 which is significantly lower than the State of California 4.8 percent for the same period. The City of Santa Maria's population in 2003 was estimated at 81,944 with a 5.8 percent increase - 1 percent greater than the State of California for the same period.

3.2.1.2 Housing

On-base housing consists of 2,200 units for accompanied personnel, quarters for approximately 400 unaccompanied personnel, and a trailer park located east of the main portion of the Cantonment area. The vacancy rate in the accompanied personnel housing area is approximately 15 percent.

Housing data for the vicinity were analyzed to determine if anticipated growth could be accommodated by current housing availability. Census data from 2000 was used to determine housing units and vacancy rates. Santa Barbara County had 142,901 total housing units with 6,279 vacant housing units; Lompoc's rates in 2000 were 13,621 housing units, 561 vacant units, and Santa Maria had a total of 22,847 housing units with 727 vacant units (U.S. Census Bureau, 2006).

3.2.1.3 Employment

According to the U.S. Census Bureau, the unemployment rate in Santa Barbara County in 2005 stood at 7.2 percent. Slightly above this rate, Santa Maria's unemployment stood at 7.3 percent, while the County's unemployment rate was lower at 5.1 percent. According to the Lompoc Chamber of Commerce, the unemployment rate for the City stood at 5.4 in October 2002 - lower than the statewide unemployment rate of 6.7 percent for the same period (California Department of Finance October, 2003). The most recent employment rates indicate this region is experiencing much of the same economic growth as the as California and the nation as a whole have been experiencing in the last several years. As for types of employment occupations, census data shows retail trade and service proving industries as the two largest employment sectors for all three areas. This employment data indicates the feasibility of integrating additional workers into the labor force is high.

3.2.1.4 Schools

The total enrollment for Santa Barbara County in 2005 for K-12 was 72,915 (U.S. Census Bureau, 2006). The project area lies within the Lompoc Unified School District (LUSD). For the school year 2004-2005 the total enrollment was 11,336 students in 10 elementary schools, three middle schools, two high schools, a continued education school and an alternative school (California Department of Education, 2006). The district offers a comprehensive special education program, and all disabled students are provided for in the local schools or neighboring school districts. Other specialized programs for disadvantaged and bilingual children are provided as part of the regular school program. Education data were analyzed for Lompoc Unified School District, Santa-Maria-Bonita Elementary, and Santa Maria Joint High School District. The 2004-2005 the total enrollment was 11,336 for LUSD, an 18.83 percent of increase since 2000 (U.S. Census Bureau, 2006). In terms of class size, LUSD had a 20.8 Pupil-Teacher ratio for the school year 2004-2005 - lower than the statewide ratio 21.5.

The Santa Maria-Bonita Elementary School District had an enrollment of 12,771 students for the 2004-2005 School year with a Pupil Teacher ratio of 22.0 higher than the statewide ratio. Finally, the Santa Maria Joint Unified High School District had an enrollment of 7,114 students with a Pupil-Teacher ratio of 26.3 - much higher than the statewide ratio of 21.5 (California Department of Education, 2006). These figures suggest that the school system in the region is adequate, with some issues related to capacity for the Santa Maria Unified High School District.

3.3 CULTURAL RESOURCES

The existing cultural resource setting for the project sites associated with the proposed project/action is tiered from information contained in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the cultural resource setting identified for the Cantonment Area. As applicable, additional information has been incorporated into this section to supplement and update the existing conditions information as it relates to the project sites associated with the proposed project/action.

3.3.1 Cultural Setting

General trends throughout California prehistory are reflected to some degree in the archaeological remains from the project area. These trends include an increase in population density coupled with greater sedentism, the development of food procurement and processing techniques, and the exploitation of a great diversity of food resources over time. While claims have been made for earlier occupation of the project area, the earliest well-documented archaeological evidence indicates that people inhabited the project area for at least 9,000 years. The prehistory of Vandenberg AFB has been divided into broad periods based on economic, technological, sociocultural, and demographic changes that are observable in the archaeological record.

3.3.1.1 Prehistory

Generally, archaeologists are in agreement regarding the earliest prehistory in the vicinity of Vandenberg AFB. Archaeological sites in California dated to 9,000 to 12,000 years ago are attributed to Paleoindian populations. Evidence suggests that Paleoindian populations throughout California and elsewhere were small and it is often claimed that Paleoindian subsistence economies emphasized the capture of big game, including now extinct megafauna such as mammoth and mastodon. Although Paleoindian sites are rare in California, when found, they are usually near large bodies of water. These sites are characterized by the presence of chipped stone tools and absence of millingstones, common in later periods. A single projectile point fragment from the coastal plain east of Point Conception (5 miles south of Vandenberg AFB) and a site north of Point Conception at the mouth of the Santa Ynez River provide evidence of the earliest (9,000-year-old) known occupation of the area presently occupied by the Base.

Various researchers have developed different post-Paleoindian chronologies for the project area, and although the dates and designations for prehistoric periods vary from researcher to researcher, the basic patterns these periods describe are the same. The most widely accepted chronology for the project area is King's (1990), which divides the post-Paleoindian prehistory into three major periods (Early, Middle, and Late). The Early Period began around

8,000 years before present (b.p.), the Middle Period began around 3,200 years b.p., and the Late Period began around 850 years b.p. These major periods are, in turn, subdivided based on changes in artifact types. Rogers (1929) also developed a chronology that divided the prehistory of the area into three major periods: Oak Grove, Hunting People, and Canalino. Wallace's chronology (1955) consisted of four major periods: Early Man, Millingstone, Intermediate, and Late Prehistoric. Following King (1990), Erlandson attempted to synthesize the work of previous researchers in the project area (Erlandson, 1993). Erlandson's prehistory has been frequently cited in other environmental impact assessments, and is used in the discussion below as well.

During the Early Period, specifically from 9,000 to 5,000 years ago, large game hunting became less common and was largely replaced by a more diversified subsistence base with a greater emphasis on gathered resources, such as seeds and shellfish. The increasing importance of seeds and other plants in the subsistence diet is evidenced by the fact that grinding stones are more prevalent than projectile points and other flaked stone tools in sites from this period. This trend is also observed in other parts of California and elsewhere, and is typically referred to as the Millingstone Horizon. In the project area, there is evidence for long-distance trade, but little craft specialization during this period. Permanent settlements and associated cemeteries appear in the project area around this time. People living in the area during this period appear to have been fairly sedentary, as indicated by the permanent settlements, and to have had a relatively egalitarian society, as indicated by the burials and grave goods, for example.

Over the next 3,000 years, several significant changes show up in the archaeological record. Between about 5,000 and 6,000 years ago, portable mortars and pestles replace manos and metates in the project area, indicating an increasing reliance upon oily seeds such as acorns, which are more efficiently processed with the mortar and pestle. From 5,000 to 2,000 years ago, increasing numbers of projectile points, including large side-notched forms, new types of fishing tackle and a diverse array of land- and sea-mammal remains become more prevalent. Sites from this period generally show increases through time in population size, density, and settlement diversity. These changes in the archaeological record have been interpreted as an intensification and expansion of earlier subsistence strategies which allowed for a more sedentary population and greater concentrations of population in large villages. Again, many of these phenomena are echoed at sites of this period in other parts of California.

During the period from 2,500 to 200 b.p. (inclusive of most of the Middle Period and all of the Late Period), project area sites began gradually to reflect the "sophisticated and fully maritime culture" of the ethnographically known coastal Chumash, discussed below (Erlandson, 1993). The Chumash of this period were characterized by well-organized villages of up to 1,000 people, hierarchical social organization, occupational specialization, a money economy and extensive trade, and a proliferation of material goods of all kinds.

Chumash artifacts of this period, including projectile points, fishing and sea mammal hunting tackle, comals, charmstones, animal effigies, digging stick weights, and various ornaments, show a highly developed artistry and reflect the remarkable elaboration of Chumash society. Shell bead currencies and the bow and arrow also appear. Moratto (1984) has remarked that during this period the Chumash developed a culture “as elaborate as that of any hunter-gatherer society on earth.”

David Rogers (1929) identified the prehistoric cultures that locally developed during this Late Period as belonging to the “Canalino Tradition.” Similar cultures existed throughout coastal and inland Southern California and the Channel Islands. Canalino peoples developed a focal economy based both on the exploitation of marine resources and the seasonal collection of acorns, hard seeds, and shellfish. Interior Canalino sites tend to lack substantial evidence of oceanic resources, including the plank canoes which are prevalent along the Santa Barbara coast and channel.

3.3.1.2 Ethnography/Ethnohistory

The inhabitants of the Vandenberg AFB area at the time of European contact in 1542 were the Chumash, a group of peoples linked by a common language family and similar materials culture who inhabited the area from Estero Bay in San Luis Obispo County to the north to the coast near Malibu (named for the Chumash village of Humaliwo) to the south, and possibly as far east as the southwest San Joaquin Valley (Landberg, 1965). The entire Chumash population has been estimated at about 15,000 to 20,000 in the year 1770 (Moratto, 1984).

There was great cultural diversity among the Chumash groups (Grant, 1978) and peoples speaking Chumash languages comprised a large number of ethnic and linguistic subgroups. The people living in the immediate vicinity of Vandenberg AFB have been grouped with the Purisimeño Chumash, named after the Mission La Purísima Concepción. The Purisimeño spoke the Purisimeño dialect of the Chumash language. The Purisimeño occupied a territory along the coast from Point Conception to the Santa Maria River area and inland from the Pacific Ocean to the present-day town of Buellton. The area presently occupied by Vandenberg AFB occupies a substantial portion of this territory. Probably the most accurate data with which to reconstruct the historic Purisimeño Chumash populations living in the vicinity of the project area are contained in early Spanish diaries of the Gaspar de Portola expeditions in 1769 and 1770.

To the north were the Obsipeño Chumash and to the south were the Barbareño Chumash. Inland from the Purisimeño were several Interior Chumash groups, including the Cuyama and Ynezeño. Less is known about the Purisimeño Chumash than the Barbareño Chumash of the Santa Barbara Channel where the densest Chumash populations resided at the time of European contact. In contrast to the Barbareño, the Purisimeño were more dependent on inland resources than their counterparts along the Santa Barbara Channel coast, and many of

their settlements were located in the interior valleys of the Vandenberg area. They were not as dependent on offshore fishing and cross-channel trade and did not use the plank canoe (which was important to the Barbareño Chumash who lived to the south of Point Conception). Purisimeño subsistence emphasized terrestrial resources and the collection of shellfish and fish species found in the rocky intertidal zone, whereas Barbareño subsistence emphasized marine and offshore resources (Glassow, 1977), though nearshore and intertidal resources were still extremely important resources to the Barbareño.

The Purisimeño differences from their neighbors in the Santa Barbara Channel area stemmed largely from the differences in their respective environments (Glassow and Wilcoxon, 1988). Glassow and Wilcoxon (1988) suggest that greater exposure to the prevailing northwest wind, cold currents, and rough seas prevented the Purisimeño from using the *tomol* (the plank canoe of the Barbareño, south of Point Conception) to acquire pelagic fish. In addition, terrestrial food resources were fewer and less densely distributed in the Purisimeño area, undoubtedly contributing to the small population size (estimated at 0.8 people per square kilometer versus 8.8 people per square kilometer for the Channel area) and the smaller number and size of Purisimeño villages compared to the Barbareño (Glassow and Wilcoxon, 1988; Greenwood, 1978). Some researchers have concluded that the smaller villages reflect the greater mobility of the Purisimeño and that this higher degree of mobility allowed the Purisimeño to better exploit the available resources (Bamforth, 1984; Glassow et al., 1976).

Terrestrial resources used by the Purisimeño included deer, rabbits, acorns, red maid seeds, chia, and various berries, roots, and bulbs. Purisimeño marine food resources included shellfish, intertidal fish, sea mammals, and probably some seaweed.

Inland villages were typically situated at the confluence of two perennial streams or along major rivers; along the coast, they were usually in the lee of a point, the exception being the village of *Nucsuni* at Purísima Point (Berry, 1988). Known villages within Vandenberg AFB include *Salspilil*, *Estep*, *Lospe*, *Nocto*, and *Lompoc*. The three closest villages to the project area were *Salspilil* (or *Saxpilil*), *Estep* (or *Step*), and *Lompoc*. *Salspilil* and *Estep* were located in the San Antonio Valley, north and northeast of the Cantonment Area, respectively. *Lompoc* was to the south of the Cantonment area (King, 1984). *Lospe* is also within the northern portion of Vandenberg AFB and is located on the south-facing coastal plain south of Point *Sal*. *Nocto* (designated site CA-SBA-2 10) is located on a south-facing coast, less than 4 miles southeast of Point Arguello.

3.3.1.3 History

The era of Chumash contact with Europeans began with initial Spanish exploration of the California coast by Juan Cabrillo in 1542 (Landberg, 1965). Several early Spanish expeditions passed through the area presently occupied by Vandenberg AFB. In 1769, the Gaspar de Portola expedition passed through the area, traveling overland from San Diego to

Monterey and stopped again on their return voyage in 1770. Portola noted the Chumash village of *Nocto* near Point Arguello during this expedition. Juan Bautista de Anza and his 240 companions also camped in the area.

By the early 1800s, the Spanish occupied nearly all of the coastal Chumash territory, established several missions within Chumash territory, and missionized nearly all of the coastal Chumash. Missions established in Chumash territory included the Mission of San Luis Obispo (founded 1772), the Mission La Purísima Concepción (established in 1788 in the present-day city of Lompoc), and Mission Santa Ynez (founded 1804). Most of the early Spanish settlers in the project vicinity were associated with either the Mission La Purísima or the Mission Santa Ynez. By 1803, La Purísima had recruited most of the Chumash people that occupied the surrounding villages and camps in the vicinity of present-day Vandenberg AFB. Poor sanitary conditions in the missions, introduced diseases, loss of traditional hunting and gathering lands and resources due to Spanish colonial activities, loss of traditional trade partners due to missionization, and lower birth rates as a result of all of these other factors drastically affected native population levels during this period.

Following the Mexican Revolution of 1821, California became part of the Republic of Mexico and a new Alta California government was established. In 1834, the Republic ordered that the missions be secularized and their lands confiscated. Most of these lands were granted to Mexican military officers and their descendants or were sold to Mexican citizens. The main use of mission lands had been cattle ranching, and this remained unchanged after they were sold to Mexican citizens. During this period, Chumash and other mission Indians worked as manual laborers on the newly formed ranchos.

Rancho Jesus Maria included a portion of the Cantonment Area. This rancho extended from Shuman Creek at the northwest corner of Vandenberg AFB to the Santa Ynez River, which forms the dividing line between the northern and southern sections of the Base. The rancho extended from the Pacific Ocean to a few miles east of the San Antonio Terrace, north of the project area, and Burton Mesa in the project vicinity. In 1837, the Mexican government granted the Rancho Jesus Maria to a Mexican soldier named Lucas Olivera.

Lewis Burton purchased the land in 1853 and the Burtons held the ranch for nearly 50 years, gradually selling off parts of it to various individuals and companies who continued to use the land primarily for cattle ranching. The Union Oil Company purchased the ranch and sold the surface rights to E.J. Marshall in 1906. Marshall added a guest section to the ranch in 1934 and named the entire operation “Marshallia.”

Vandenberg AFB began its existence in 1941 as Camp Cooke, a World War II and Korean War Army training camp. Camp Cooke was to play a significant role as a training facility during World War II (1941-1945) and during the Korean War (1950-1953). In 1941, the federal government began constructing an army training facility on approximately 92,000

acres of coastal land it acquired, including 65,000 acres of the Rancho Jesus Maria, 27,000 acres of Rancho Lompoc to the south, and smaller parcels of the surrounding Casmalia, Todos Santos y San Antonio, Mission Purísima, and Guadalupe land grants. The Army named the new base Camp Cooke in honor of Civil War General Philip St. George Cooke. While construction of barracks and various support structures progressed, the United States entered World War II. At its peak, facilities at Camp Cooke included a hospital, fire stations, chapels, warehouses, theaters, recreational facilities, miles of paved roads, railroad sidings, a “mock city” used for training, a prisoner of war (POW) camp, and a maximum security Army Disciplinary Barracks.

The Army deactivated Camp Cooke at the end of World War II, reactivated the training camp when the Korean War broke out (1950), and deactivated the base once again and put it under caretaker status in 1953 when fighting in Korea came to an end. Under caretaker status, most of the base was leased for agriculture and grazing. The property was transferred to the Air Force, which reopened it as the West Coast Missile Center in 1956. In 1958, the Base had its first missile launch, the Thor, and was renamed Vandenberg AFB.

Vandenberg AFB quickly became one of the premier high-technology centers of the Air Force and was a key test and launch facility for long-range missiles and military satellites, as well as an important element of the Man in Space program for NASA. The base played a crucial role in the major military programs that shaped the character of the Cold War. Its role was related primarily to the construction and operation of missile launch and support facilities that have been ongoing since 1964. The base is the only site where the United States’ intercontinental ballistic missiles (ICBMs) were test-launched under operational conditions. In addition, thousands of missile combat and maintenance crews received their training at the base. The installation also served as a launch site for numerous critically important military satellites, as well as civilian science and application satellites. The only other installation in the United States that rivals the Cold War significance of Vandenberg AFB in terms of its contribution to the nation’s ballistic missile and space programs is Cape Canaveral Air Station in Florida. The base currently maintains numerous launch complexes and support facilities, many of which supported these and other Cold War-related missions.

3.3.2 Existing Resources

Information used to determine whether existing resources are present at the location of the proposed project site are derived from previous survey reports as well as an archaeological site record and literature search completed at the 30th CES/CEVPC, Vandenberg AFB in association with the Requirements Document proposed for the project.

3.3.2.1 Archaeological Resources

An archaeological site record and literature search was conducted at the 30th CES-CEVPC, Vandenberg AFB, California in association with the Cantonment Area EA. The research included a review of literature, archaeological base maps, and cultural resource records. Previous cultural resource studies and recorded cultural properties within 1.0 mile of the Cantonment project area were identified during the research. Table 3-3.1 provides a summary of the archaeological properties (sites and isolates) recorded within the Cantonment Area. As shown in this table, there are six recorded archaeological sites (five prehistoric, one historic) and seven prehistoric isolates within the Cantonment area. (A single artifact found on the ground surface is referred to as an isolate. Isolates are categorically exempt from National Register eligibility.)

According to a review of the Vandenberg AFB Comprehensive GIS Plan and archaeological database, there are no recorded cultural resources within the sites associated with the proposed project.

TABLE 3-3.1
SUMMARY OF RECORDED ARCHEOLOGICAL SITES WITHIN
THE CANTONMENT AREA, VANDENBERG AIR FORCE BASE

Site No.	Site Type			Type of Site	Site Description	Dimension	Assessment/NRHP Eligible?
	Pre-historic	Historic	Both				
CA-SBA-1869	X			Lithic scatter	Trace density scatter of chert flakes (possible seasonal procurement camp)	750m x 70m x 60cm	Not formally evaluated. Integrity good. Underground cable may have destroyed 5 percent of site. Reference: J.M. Foster (Greenwood and Associates) 1984
CA-SBA-2554	X			Lithic scatter	Trace to light density of stone (Monterey chert) flakes on sandy terrace on protected canyon bottom near spring (note: examine similar settings in other canyons)	30m x 30m x ?	Not formally evaluates. Site originally recorded by Larry Spanne in 1960s. Probably destroyed during VAFB Landfill construction. Reference: R.O. Gibson and L. Spanne (Archaeological Consulting) 1992
CA-SBA-2569/H		X		Historic domestic debris scatter	Diffuse scatter of pre-World War II glass, ceramics, wires, rusted tin, saw bone and shell fragments (clam, abalone, turban). Probably associated with the "Fern Spring Camp," associated with the Marshall Ranch.	121m x 106m x ?	Not formally evaluated. An ORV trail intersects the site. Reference: K. Osland, S. Berry 1992
CA-SBA-2570	X			Lithic scatter	Trace scatter of Monterey chert flakes and two biface fragments	76m x 106m x ?	Not formally evaluated. An abandoned jeep trail bisects the site. Reference: K. Osland, S. Berry 1992
CA-SBA-2681	X			Lithic scatter	Low density scatter of Monterey chert cores, flakes, and shatter	20 x 150 x ?	Not formally evaluates. Disturbance from telephone poles noted. Reference: Cagle and McDowell (Science Applications International.) 1993

TABLE 3-3.1 (CONTINUED)
SUMMARY OF RECORDED ARCHEOLOGICAL SITES WITHIN
THE CANTONMENT AREA, VANDENBERG AIR FORCE BASE

Site No.	Site Type			Type of Site	Site Description	Dimension	Assessment/NRHP Eligible?
	Pre-historic	Historic	Both				
CA-SBA-2876	X			Lithic scatter (possible quarry site)	Large, dense scatter with several thousand possible red Franciscan chert flakes/shatter, several possible bifaces, 3 quartzite hamerstones. Probably a lithic procurement site.	250 x 40 x ?	Not formally evaluated. Possible disturbance from road grading and water erosion. Site may extend into adjacent brushy areas. Reference McDowell et al. (SAI) 1995
iso-375	X			1 biface fragment	Large Monterey chert biface fragment	--	Not NRHP eligible Reference: Engineering Science 1992
iso-500	X			1 flake	Monterrey chert flake	--	Not NRHP eligible Reference: C. Cagle, D. McDowell (SAI) 1993
Iso-509	X			1 piece of shatter	Monterrey chert shatter	--	Not NRHP eligible Reference: P. Eisentraut, T. Wahoff (Dames & Moore) 1994
Iso-607	X			1 biface fragment	Monterrey chert biface fragment	--	Not NRHP eligible Reference: M. Imwalle, B. Sheets (INFOTEC) 1995
Iso-609	X			1 shell pendant	Rectangular abalone shell pendant with ground edges and hole drilled near one edge	--	Not NRHP eligible Reference: M. Imwalle, B. Sheets (INFOTEC) 1995
Iso-610	X			1 flake	Monterrey chert tertiary flake	--	Not NRHP eligible

3.4 EARTH RESOURCES

The earth resources setting for the project sites associated with the proposed project/action is tiered from information contained in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the earth resources setting. As applicable, additional information has been incorporated into this section to supplement and update the existing conditions information as it relates to the project sites associated with the proposed project/action.

3.4.1 Regional Geologic Setting

The portion of Vandenberg AFB north of the Santa Ynez River, which includes the Cantonment Area, lies within the Coast Ranges geomorphic province, and the portion of Vandenberg AFB south of the Santa Ynez River lies in the Transverse Ranges geomorphic province. Basement rocks in the Vandenberg AFB area include the Jurassic-age Franciscan Formation and Point Sal Ophiolite. The basement rocks are unconformably overlain by Tertiary-age sedimentary rocks, most extensively to the mid to late Miocene Monterey Shale and the late Miocene Sisquoc Formation. These rocks are unconformably overlain by the Pleistocene-age Orcutt Sand, alluvial deposits of sand, silt, and gravel, and by Holocene-age dune sand.

The topography of the Vandenberg AFB area is varied. Hilly regions include the Casmalia Hills which rise to an elevation of approximately 1,600 feet above sea level at the north end of the base, and the Santa Ynez Mountains which rise to an elevation of approximately 2,100 feet above sea level at the south end of the Base. Between these features are three terraced areas of relatively low relief known as the San Antonio Terrace, Burton Mesa, and the Lompoc Terrace.

The Cantonment area of Vandenberg AFB lies on Burton Mesa. The surface of Burton Mesa is relatively flat overall, but moderately hummocky with local depressions of limited aerial extent in undeveloped areas. The north, east and south edges of the mesa are incised by creeks which drain either to San Antonio Creek or the Santa Ynez River.

3.4.2 Soils

Soils in the Cantonment Area are classified as the Tangair-Narlon association soils. The properties of Tangair soils are described as: good source for sand, subject to wind erosion, medium shear strength, medium to high piping hazard, rapid permeability, and somewhat poor drainage. The properties of Narlon soils are described as: poor source for sand and gravel, very slow permeability with perched water during the rainy season, high shrink-swell potential, medium to low shear strength, medium piping hazard.

3.4.3 Geologic Hazards

The geologic hazards which can occur on Vandenberg AFB include landslides/erosion, seismicity, surface ruptures, and liquefaction.

3.4.3.1 Landslides/Erosion

Landslides in the Cantonment Area are unlikely to occur due to the relatively flat ground surface. Landslides are not considered to be a hazard in the Proposed Project Area.

3.4.3.2 Seismicity

The California Division of Mines and Geology (CDMG) classifies active faults as those showing evidence of surface displacement within Holocene time (the last 11,000 years) and potentially active faults as those showing evidence of surface displacement within Quaternary time (the last 1.6 million years). Faults which are known to exist on Vandenberg AFB include the Lions Head fault, the Santa Ynez River fault, the Honda fault, and the Pacifico fault. There are likely hundreds of smaller unidentified faults in the Vandenberg AFB region which are related to movement on these faults. All of these major and minor faults are likely to be continuous with the offshore Hosgri fault zone. The San Andreas fault zone is located approximately 30 miles northwest of the study area. Any of the faults described above have the potential to cause strong ground motion within the Proposed Project Area.

Earthquake statistics indicate 135 quakes were reported from 1932 to 1975 within 30 miles of Vandenberg AFB, an average of approximately three per year, with magnitudes of 2.5 to 4.9 on the Richter Scale. The most powerful earthquake in the Vandenberg AFB area had a reported magnitude of 7.3 on the Richter scale. The epicenter of that major earthquake was located approximately 16 miles west-northwest of Point Arguello.

3.4.3.3 Surface Rupture

Surface rupture, in which the ground surface opens along a weak zone, can occur as a result of local and regional seismic shaking. The potential for surface rupture is considered low on Vandenberg AFB. None of the faults located on Vandenberg AFB show evidence of surface rupture within Holocene time, and no active or potentially active faults have been identified within the Cantonment Area.

3.4.3.4 Liquefaction

Liquefaction results from periods of extended ground shaking during which porewater pressures increase and the ground is temporarily altered from a solid to a liquid state. The loss of strength can result in damage to engineered structures. There are no areas of

Vandenberg AFB where liquefaction is known to have occurred and the potential for liquefaction is considered to be low. However, the possibility of liquefaction occurring within the Cantonment Area cannot be ruled out completely due to the presence of sandy soil, fill material, and shallow perched water tables.

3.5 WATER RESOURCES

The existing water resource conditions for the project sites associated with the proposed project/action is tiered from information contained in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the water resources setting. As applicable, additional information has been incorporated into this section to supplement and update the existing conditions information as it relates to the project sites associated with the proposed project/action.

3.5.1 Regional Setting

Santa Barbara County's water supply is presently from imported water, groundwater basins, and surface reservoirs. The imported water is delivered from Northern California by the Coastal Branch Aqueduct of the State Water Project. Vandenberg AFB is able to meet base-wide demand the majority of the year with only the State water supply. Maximum day demands cannot be met solely with State-supplied water, but require several groundwater supply wells to be online to supplement the water supply during times of peak demand.

3.5.2 Surface Water

Surface waters in the Cantonment Area include San Antonio Creek, located north of Burton Mesa, and the Santa Ynez River located south of Burton Mesa. There are no surface bodies of water located on the proposed project site. Intermittent creeks, drainage channels, and small ponds may exist temporarily in local topographic depressions during the rainy season in the vicinity of the Proposed Project Area; however, there are no vernal pools within the project boundary.

3.5.3 Flood Hazards

The Proposed Project is not located within a 100-year flood plain. Major flooding is unlikely due to the permeability of the underlying soils and the elevation of the Burton Mesa. Minor, localized flooding can occur during periods of very heavy rainfall.

3.5.4 Groundwater

Aquifers capable of yielding large quantities of water usable for water supply in the Vandenberg AFB area are generally restricted to the San Antonio Creek and Santa Ynez River valleys. There are four working wells in the San Antonio Creek Basin which provided all water supplies for the Cantonment Area prior to the completion of the Coastal Branch Aqueduct. Currently, these wells are maintained only as a backup to the State water supply. The quality of water in the San Antonio Creek Basin is considered to be good and meets all National Primary and Secondary Drinking Water Regulations. In the proposed project area,

groundwater occurs only in shallow perched zones, which cannot supply sufficient quantities of water for domestic, industrial, or agricultural use. There are no groundwater supply wells in the vicinity of the proposed project. The closest groundwater well to the proposed sites is located approximately 0.5 mile to the southeast.

3.6 AIR QUALITY

The existing air quality conditions as it relates to the proposed project/action is tiered from information contained in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the air quality conditions for the Cantonment Area. As applicable, additional information has been incorporated into this section to supplement and update the existing air quality conditions information.

3.6.1 South Central Coast Air Basin

The project site is located within the South Central Coast Air Basin (Basin), which includes all of San Luis Obispo, Santa Barbara, and Ventura Counties. Vandenberg AFB is located in the western portion of the basin adjacent to the Pacific Ocean.

The climate at Vandenberg AFB is Mediterranean, or dry summer tropical. The weather is cool and wet from November through April and warm and dry from May through October. The Pacific Ocean, which borders Vandenberg AFB on the west and south, has a moderating effect on temperature fluctuations. The mean temperature ranges from 53 to 62 degrees Fahrenheit.

Air pollutants within the Basin are generated by both stationary and mobile sources. One type of stationary source is known as a “point source,” which has one or more emission sources at a single facility. The other type of stationary source is the “area source,” which is widely distributed and produces many small emissions. Point sources are usually associated with manufacturing and industrial uses, and include sources that produce electricity or process heat, such as refinery boilers or combustion equipment, but may also include commercial establishments, like gasoline stations, dry cleaners, or charbroilers in restaurants. Examples of area sources include residential water heaters, painting operations, lawn mowers, agricultural fields, landfills, and consumer products, such as barbecue lighter fluid or hair spray. “Mobile sources” refer to operational and evaporative emissions from motor vehicles. Common pollutants of concern within the Basin are described below along with associated health effects.

3.6.1.1 Ozone (O₃)

Ozone is what is known as a photochemical pollutant. It is not emitted directly into the atmosphere, but is formed by a complex series of chemical reactions between ROG, NO_x and sunlight, so it is considered a regional air pollutant. ROG and NO_x are emitted from automobiles, solvents, and fuel combustion. Significant O₃ formation generally requires an adequate amount of precursors and several hours in a stable atmosphere with strong sunlight. It is generated over a large area and is transported and spread by wind. The worst O₃ concentrations tend to be found downwind from emission sources in metropolitan areas. O₃

exposure can cause eye irritation and damage to lung tissue in humans. Ozone also harms vegetation, reduces crop yields, and accelerates deterioration of paints, finishes, rubber products, plastics, and fabrics.

3.6.1.2 Reactive Organic Gases (ROG)

ROG, also known as volatile organic compounds, are photochemically reactive hydrocarbons that are important for O₃ formation. This definition excludes methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonates, methylene chloride, methyl chloroform, and various chlorofluorocarbons (CFCs).

3.6.1.3 Nitrogen Oxides (NO_x)

Oxides of Nitrogen are a family of gaseous nitrogen compounds that are precursors to O₃ formation. The major component of NO_x, nitrogen dioxide (NO₂), is a reddish-brown gas that is toxic at high concentrations. NO_x results primarily from the combustion of fossil fuels under high temperature and pressure. NO_x is a reddish-brown gas that discolors the air; it is formed during combustion. Its health effects include increased risk of acute and chronic respiratory disease.

3.6.1.4 Carbon Monoxide (CO)

Carbon Monoxide is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels and is emitted directly into the air. Under most conditions, CO does not persist in the atmosphere and is rapidly dispersed. CO concentrations are most likely to be the highest during the winter months, when relatively low inversion levels trap pollutants near the ground and concentrate the CO. CO health effects are related to its affinity for hemoglobin in the blood. At high concentrations, carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity, and impaired mental abilities.

3.6.1.5 Particulates

Particulates are suspended particulate matter (airborne dust) and consist of particles small enough to remain suspended in the air for long periods. Respirable particulate matter (PM₁₀ and PM_{2.5}) includes particulates of 10 microns or less in diameter: small enough to be inhaled, pass through the respiratory system, and lodge in the lungs. These particles can consist of dust, sand, salt spray, metallic or mineral particles as well as pollen, smoke, mist, and acid fumes. Also of importance are sulfate (SO₄) and nitrates (NO₃) from photochemical reactions of gaseous sulfur dioxide (SO₂) and NO_x in the atmosphere. The actual composition of PM₁₀ and PM_{2.5} varies greatly with time and location dependent upon the sources of the material and meteorological conditions. Chronic particulate inhalation can cause bronchitis,

chronic cough, respiratory illness, pulmonary diseases and asthma exacerbations, decreased longevity, and lung cancer.

3.6.1.6 Sulfur Oxide (SO_x)

Oxides of Sulfur are gaseous compounds of sulfur and oxygen that are colorless but containing a strong smell of “rotten eggs.” SO_x is formed when sulfur-containing fuel is burned by mobile sources, such as locomotives, ships, and off-road diesel equipment. SO_x is also emitted from several industrial processes, such as petroleum refining and metal processing. Exposure of a few minutes to low levels of SO_x can result in airway constriction in some asthmatics. All asthmatics are sensitive to the effects of SO_x. In asthmatics, increase in resistance to air flow, as well as reduction in breathing capacity leading to severe breathing difficulties, are observed after acute exposure to SO_x. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO_x.

3.6.1.7 Sulfates (SO₄²⁻)

Sulfates are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized SO₂ formed during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO₂ to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features.

3.6.1.8 Lead (Pb)

Lead in the atmosphere is present as a mixture of several compounds. Leaded gasoline and lead smelters have typically been the main sources emitted into the air. Lead was used as an additive that increased the octane rating in gasoline. Since gasoline-powered automobile engines were a major source of airborne lead and given the use of leaded fuels has been mostly phased out, the ambient concentrations of Pb have dropped dramatically. In fact, the APCD itself no longer conducts ambient monitoring for lead.

3.6.1.9 Hydrogen Sulfide (H₂S)

Hydrogen sulfide is a colorless gas with the odor of “rotten eggs”. It is formed during bacterial decomposition of sulfur-containing organic substances. H₂S is associated with geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations. Hydrogen sulfide has a distinct odor and can cause dizziness, nausea, and headaches at low concentrations, and more serious effects at higher concentrations. It is naturally emitted in geothermal areas and is also associated with certain industrial processes. There is a state ambient air quality standard for hydrogen sulfide but no

corresponding national standard. Concentrations of this pollutant are not monitored within the Basin.

3.6.1.10 Vinyl Chloride

Vinyl chloride (chloroethene), a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, due to microbial breakdown of chlorinated solvents.

Air quality is determined primarily by the type and amount of contaminants emitted into the atmosphere, the size and topography of the air basin, and the meteorological conditions. The Basin has low mixing heights and light winds, which are conducive to the accumulation of air pollutants. The determination of whether a region's air quality is healthful or unhealthful is determined by comparing contaminant levels in ambient air samples to national and state standards. The criteria pollutants for which federal and state standards have been developed and that are most relevant to air quality planning and regulation in the Basin are O₃, CO, fine suspended particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂), and lead. The state and national ambient air quality standards for each of the monitored pollutants and their effects on health are summarized in Table 3.6-1.¹

3.6.2 Regulatory Setting

Air quality within the Basin is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policymaking, education, and a variety of programs. The agencies primarily responsible for improving the air quality within the Basin are discussed below, along with their individual responsibilities.

3.6.2.1 Federal Regulations

3.6.2.1.1 U.S. Environmental Protection Agency. At the federal level, the Environmental Protection Agency (USEPA) has been charged with implementing national air quality programs. The USEPA's air quality mandates are drawn primarily from the Federal Clean Air Act (CAA) and the 1990 amendments. The predecessor to the CAA was the Federal Air Pollution Control Act enacted in 1955. It empowered the Secretary of Health, Education, & Welfare (HEW) to work for a better understanding of air pollution causes and effects. The

¹ South Coast Air Quality Management District. Draft Environmental Assessment for: Proposed Amended Rule 2202 – On-road Motor Vehicle Mitigation Options (Diamond Bar, California: South Coast Air Quality Management District, November 2003), p. 3-1. This report may be found on the SCAQMD website at: <http://www.aqmd.gov/ceqa/documents/2003/aqmd/draftea/2202/reviseddea/rdea.doc>.

**TABLE 3.6-1
AMBIENT AIR QUALITY STANDARDS**

Air Pollutant	Concentration/Averaging Time		Most Relevant Health Effects
	State Standard	Federal Primary Standard	
Ozone	0.09 ppm, 1-hr. avg.	0.12 ppm, 1-hr avg. (revoked on 6/15/05) 0.08 ppm, 8-hr avg. (3-year average of annual 4 th -highest daily maximum)	a) Short-term exposures: 1) Pulmonary function decrements and localized lung edema in humans and animals; 2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; c) Vegetation damage; d) Property damage
Carbon Monoxide	9 ppm, 8-hr avg. 20 ppm, 1-hr avg.	9 ppm, 8-hr avg. 35 ppm, 1-hr avg.	a) Aggravation of angina pectoris and other aspects of coronary heart disease; b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; c) Impairment of central nervous system functions; d) Possible increased risk to fetuses
Nitrogen Dioxide	0.25 ppm, 1-hr avg.	0.053 ppm, annual arithmetic mean	a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg. 0.25 ppm, 1-hr. avg.	0.030 ppm, annual arithmetic mean 0.14 ppm, 24-hr avg.	a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in person with asthma
Suspended Particulate Matter (PM ₁₀)*	20 µg/m ³ , annual arithmetic mean 50 µg/m ³ , 24-hr avg.	50 µg/m ³ , annual arithmetic mean 150 µg/m ³ , 24-hr avg.	a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; b) Excess seasonal declines in pulmonary function, especially in children
Suspended Particulate Matter (PM _{2.5})*	12 µg/m ³ , annual arithmetic mean	15 µg/m ³ , annual arithmetic mean (3-year average) 65 µg/m ³ , 24-hr avg. (3-year average of 98 th percentile)	a) Increased hospital admissions and emergency room visits for heart and lung disease; b) Increased respiratory symptoms and disease; and c) Decrease lung functions and premature death
Sulfates	25 µg/m ³ , 24-hr avg.	None	a) Decrease in ventilatory function; b) Aggravation of asthmatic symptoms; c) Aggravation of cardio-pulmonary disease; d) Vegetation damage; e) Degradation of visibility; f) Property damage
Lead*	1.5 µg/m ³ , 30-day avg.	1.5 µg/m ³ , calendar quarterly average	a) Increased body burden; b) Impairment of blood formation and nerve conduction

TABLE 3.6-1 (CONTINUED)
AMBIENT AIR QUALITY STANDARDS

Air Pollutant	Concentration/Averaging Time		Most Relevant Health Effects
	State Standard	Federal Primary Standard	
Visibility-Reducing Particles	In sufficient amount to reduce the visual range to less than 10 miles at relative humidity less than 70%, 8-hour average (10 AM – 6 PM)	None	Visibility impairment on days when relative humidity is less than 70 percent
Hydrogen Sulfide	0.03 ppm, 1-hr avg.	None	Odor annoyance
Vinyl Chloride*	0.01 ppm, 24-hr avg.	None	Known carcinogen

Source: South Coast Air Quality Management District. Final Program Environmental Impact Report to the 2003 Draft AQMP (Diamond Bar, California: South Coast Air Quality Management District, August 2003), Table 3.1-1, p. 3.1-2. This report may be reviewed on the SCAQMD website at http://www.aqmd.gov/ceqa/documents/2003/aqmd/finalEA/aqmp/AQMP_FEIR.html.

µg/m³ = microgram per cubic meter.

ppm = parts per million by volume.

* The ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

first CAA was enacted in 1963 and empowered the HEW to define air quality criteria. The CAA was most recently amended in 1990.

The USEPA deals with global, international, national and interstate air pollution issues. Its primary role at the state level is one of federal oversight of state air quality programs through the delegation process. The USEPA sets federal vehicle and stationary source emission standards and provides research and guidance in air pollution control programs. The USEPA also has regulatory and enforcement jurisdiction over emission sources beyond state waters (outer continental shelf), and those that are under the exclusive authority of the federal government, such as aircraft, locomotives, and interstate trucking.

The CAA requires the USEPA to set National Ambient Air Quality Standards (NAAQS) for several air pollutants on the basis of human health and welfare criteria. Two types of NAAQS have been established: primary standards, which protect public health, and secondary standards that protect the public from non-health related adverse effects (e.g., visibility reduction). Primary NAAQS have been identified for the following criteria pollutants: O₃, CO, NO_x, SO_x, PM₁₀, PM_{2.5}, and lead. The NAAQS as well as the designation status for these criteria pollutants are presented in Table 3.6-2.

TABLE 3.6-2
NATIONAL AMBIENT AIR QUALITY STANDARDS AND STATUS
SOUTH CENTRAL COAST AIR BASIN

Pollutant	Averaging Time	Designation/Classification
Ozone (O ₃)	8 Hour	Attainment/Unclassifiable
	1 Hour ¹	Attainment/Unclassifiable
Carbon Monoxide (CO)	8 Hour	Attainment/Unclassifiable
	1 Hour	Attainment/Unclassifiable
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	Attainment/Unclassifiable
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	Attainment/Unclassifiable
	24 Hour	Attainment/Unclassifiable
Respirable Particulate Matter (PM ₁₀)	Annual Arithmetic Mean	Attainment/Unclassifiable
	24 Hour	Attainment/Unclassifiable
Fine Particulate Matter (PM _{2.5})	Annual Arithmetic Mean	Attainment/Unclassifiable
	24 Hour	Attainment/Unclassifiable
Lead (Pb)	Calendar Quarter	Attainment

Source: Environmental Protection Agency. "Region 9: Air Programs, Air Quality Maps." [Online] [May 30, 2004]. http://www.epa.gov/region9/air/maps/maps_top.html.

¹ The national 1-hour O₃ standard was revoked on June 15, 2005. The previous attainment designation/classification is shown for informational purposes.

3.6.2.2 State Regulations

3.6.2.2.1 California Air Resources Board. The California Air Resource Board (ARB), a board within the California Environmental Protection Agency (CALEPA), oversees air quality planning and control throughout California. It is primarily responsible for ensuring implementation of the California Clean Air Act (CCAA), responding to the Federal CAA requirements, and regulating emissions from motor vehicles and consumer products within the state. The ARB has established emission standards for vehicles sold in California and for various types of equipment available commercially. It also sets fuel specifications to further reduce vehicular emissions.

The CCAA established a legal mandate to achieve the California ambient air quality standards by the earliest practicable date. These standards apply to the same six criteria pollutants as the CAA, and also include sulfate, visibility reducing particles, hydrogen sulfide, and vinyl chloride. They are also more stringent than the federal standards and, in the case of PM₁₀ and SO_x, far more stringent.

Based on monitored pollutant levels, the CCAA divides non-attainment areas into four categories – moderate, serious, severe, and extreme – to which progressively more stringent

requirements apply. The CAAQS and attainment status for the criteria pollutants are presented in Table 3.6-3. As shown in the table, the Basin is a non-attainment area based on the state standards for O₃, PM₁₀, and PM_{2.5}.

**TABLE 3.6-3
CALIFORNIA AMBIENT AIR QUALITY STANDARDS AND STATUS
SOUTH CENTRAL COAST AIR BASIN**

Pollutant	Averaging Time	Designation/Classification
Ozone (O ₃)	1 Hour	Nonattainment/Moderate
Carbon Monoxide (CO)	8 Hour	Attainment
	1 Hour	Attainment
Nitrogen Dioxide (NO ₂)	1 Hour	Attainment
Sulfur Dioxide (SO ₂)	24 Hour	Attainment
	1 Hour	Attainment
Respirable Particulate Matter (PM ₁₀)	Annual Arithmetic Mean	Nonattainment
	24 Hour	Nonattainment
Fine Particulate Matter (PM _{2.5})	Annual Arithmetic Mean	Unclassified
Lead (Pb) ¹	30 Day Average	Attainment
Sulfates (SO ₄)	24 Hour	Attainment
Hydrogen Sulfide (H ₂ S)	1 Hour	Attainment
Vinyl Chloride ¹	24 Hour	Unclassified
Visibility Reducing Particles	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent.	Unclassified

Source: California Air Resources Board. "Area Designations (Activities and Maps)." [Online] [May 30, 2006]. <http://www.arb.ca.gov/design/design.htm>.

¹ The ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined.

The South Central Coast Air Basin is classified as a non-attainment area for O₃ and PM₁₀. Under this classification, an air quality management plan is required to be prepared to include specific emission reduction strategies, and to meet specified milestones in implementing emission controls to achieve more healthful air. The new control strategies include an indirect and area source control program, best available retrofit control technology for existing sources, a program to reduce emissions generated by new and modified permitted stationary sources (no net increase), transportation control measures, and substantial use of low-emission vehicles (e.g., natural gas or methanol-powered vehicles) by fleet operators. The CCAA also requires control measures to be ranked by priority and cost-effectiveness. The air quality management plans must achieve a reduction in emissions of 5 percent or more

per year, or 15 percent or more in a 3-year period for pollutants causing extreme non-attainment.

3.6.2.3 Local Regulations

3.6.2.3.1 Santa Barbara County Air Pollution Control District. The Santa Barbara County Air Pollution Control District (APCD) is responsible for bringing or maintaining air quality in the Basin within federal and state air quality standards. Specifically, the APCD has the responsibility to monitor ambient air pollutant levels throughout the Basin and to develop and implement attainment strategies to ensure that future emissions comply with federal and state standards. The following discusses the APCD's efforts to achieve these standards through air quality plans, rules and regulations, and guidance for evaluating projects.

3.6.2.3.2 Clean Air Plan. As discussed previously, the federal and state Clean Air Acts require the preparation of plans to reduce air pollution to healthful levels. The APCD has responded to this requirement by preparing a Clean Air Plan (CAP). The most recent update of the CAP was adopted in December 2004 and is referred to as the 2004 CAP.

Since the 2004 CAP was finalized, Santa Barbara County was declared in attainment for the federal 1-hour ozone standard by the United States Environmental Protection Agency (USEPA). The focus of the 2004 CAP is achieving attainment status for state 1-hour ozone standard, as mandated by the 1988 California Clean Air Act. The 2004 CAP shows that although the County has made progress toward meeting state ozone standards, it will continue to violate them during the planning period. This is due to the increase in offshore emissions from shipping activities, though onshore emissions will be reduced primarily through on-road mobile source emission reduction measures. State law requires that the CAP provide an annual five percent emission reduction of all non-attainment pollutants or, if this cannot be done, include every feasible measure as part of the emission control strategy. The 2004 CAP identifies every feasible control measure in lieu of the five percent annual emission reduction requirement. The 2004 CAP notes that control measures to reduce ozone precursors will also reduce PM₁₀ to some degree. However, the County must identify additional measures to reduce PM₁₀ in order to meet the state standards. A separate plan has not been prepared to address the County's non-attainment status for PM₁₀.

The 2004 CAP contains stationary source control measures and transportation control measures (TCMs) to reduce emissions from mobile sources. For stationary sources, these measures include controls on emissions of landfill gases, emissions from petroleum production facilities, vapors from vehicle fueling, architectural coatings, consumer and industrial products, and internal combustion engines, among others. TCMs focus on reducing car dependency and vehicle miles traveled and include measures to encourage the use of alternative modes of transportation, such as public transit or bicycling.

3.6.2.3.3 APCD Rules and Regulations. The APCD has the primary responsibility under the California Health and Safety Code for controlling air pollution from stationary sources in order to protect the public health. This responsibility includes the authority to develop, adopt, and enforce rules. Specific rules and regulations have been adopted by the APCD Board limiting the emissions that can be generated by various stationary uses and activities, and identifying specific pollution reduction measures that must be implemented in association with various stationary uses. These rules regulate the emissions of the six criteria air pollutants, as well as toxic emissions and nuisance odors. They are also subject to ongoing refinement by the APCD.

3.6.2.3.4 CEQA Air Quality Guidelines. In November 2000, the APCD published its latest *Guidelines for the Implementation of the California Environmental Quality Act of 1970, as Amended* (Environmental Review Guidelines) as a guidance document to provide lead agencies, consultants, and project proponents with uniform procedures for assessing air quality impacts and preparing the air quality sections of environmental documents for projects subject to CEQA. This document describes the criteria that the APCD uses when reviewing and commenting on the adequacy of environmental documents. It recommends thresholds for use in determining whether projects would have significant adverse environmental impacts and describes the APCD's procedures for review of environmental documents.

In July of 2005, the APCD published its latest version of the guidance document titled *Scope and Content of Air Quality Sections in Environmental Documents*. This document contains guidance on assessing and avoiding air quality impacts. It includes an outline of the elements needed in environmental documents, environmental setting information for Santa Barbara County, significance thresholds for project and cumulative impacts, County-specific instructions for air quality modeling, and a list of potential avoidance, minimization, and management practices.

3.7 BIOLOGICAL RESOURCES

The existing biological resources setting described below for the project sites associated with the proposed project/action is tiered from information contained in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the biological resources setting for the Cantonment Area. As applicable, additional information has been incorporated into this section to supplement and update the existing conditions information as it relates to the project sites associated with the proposed project/action.

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

3.7.1 Plant Communities

The plant communities described below have generally been identified within the Cantonment area. The following descriptions provide a brief overview of the plant communities found adjacent to the proposed project sites.

3.7.1.1 Chaparral

The Central Coast Maritime Chaparral community occurring at Vandenberg AFB includes the Burton Mesa Chaparral community. This dense, scrubby community is found on poor soils and is generally dominated by manzanitas, chamise (*Adenostoma fasciculatum*), ceanothus (*Ceanothus* spp.), Coast live oak and scrub oak (*Quercus* spp.), and toyon (*Heteromeles arbutifolia*).

Burton Mesa Chaparral is a rare form of mixed chaparral with a distribution limited to Vandenberg AFB and its vicinity. This plant community is noted for being composed primarily of rare plant species. These plants are primarily shagbark manzanita (*Arctostaphylos rudis*), La Pursima manzanita (*Arctostaphylos purissima*), and Santa Barbara ceanothus (*Ceanothus impressus*). Central Coast Maritime Chaparral transitions into coastal sage scrub closer to the coast or on shaley substrates. This plant community can be found near the airfield, north of California Boulevard along Tangair Road, 13th Street, and Washington Avenue. This chaparral community also occurs on the south side of Highway 1 between California Boulevard and Azalea Lane, as well as around the landfill south of Pine Canyon Road.

3.7.1.2 Coastal Dune Scrub

Coastal dune scrub is characterized as a dense plant community located along the coast on stabilized backdunes, behind foredunes, and other transitional dune areas. Dominant shrubs and herbs include goldenbush (*Ericameria ericoides*), Chamisso's brush lupine (*Lupinus chamissonis*), coastal sagewort (*Artemisia pycnocephala*), and Blochman's butterweed (*Senecio blocmaniae*). Away from the coast, this community intergrades into Maritime chaparral or Coastal sage scrub. Coastal dune scrub can be found near 35th Street and California Boulevard.

3.7.1.3 Coastal Sage Scrub

Coastal sage scrub is a plant community found principally near the coast. It is a transition between coastal dunes and inland plant communities, such as annual grasslands and oak woodlands. The characteristic vegetation of this community is low shrubs and includes California sagebrush (*Artemesia californica*), sage (*Salvia* spp.), coyote bush (*Baccharis pilularis*), California buckwheat (*Eriogonum fasciculatum*), and Western poison oak (*Toxicodendron diversilobum*). California sagebrush may replace coyote bush as the dominant plant in disturbed or more mesic areas.

The largest contiguous stands of coastal sage scrub within the Cantonment Area are located north of California Boulevard along 13th Street and Washington Avenue. Coastal sage scrub appears to be reestablishing itself in some previously disturbed areas. Coyote bush and sagebrush are recolonizing some fallow fields, such as those along 20th Street between California Boulevard and New Mexico Avenue.

3.7.1.4 Urban/Exotic Vegetation

The Cantonment area consists of residential, industrial, community service, administrative, and recreational uses. The rapid expansion of the base, then Camp Cooke, during World War II resulted in the conversion of the native plant communities into urban areas. Non-native grasses, turf grasses, shrubs, and trees were established as part of the landscaping. Most of the open fields east of 20th Street are maintained and mowed.

Eucalyptus, Monterey pine, and other introduced trees were planted as windbreaks along many streets. Large, mature stands of eucalyptus are found throughout the Cantonment Area. Other introduced plant species have been used for landscaping in the improved, urbanized areas, including horticultural varieties of coniferous and deciduous trees, shrubs, and ground cover. Vandenberg AFB has an active management program of ongoing eradication of invasive exotic species, particularly Pampas grass.

3.7.1.5 Grassland

Native grasses, such as needlegrass (*Nassella* sp.), alkali ryegrass, and blue wildrye (*Elymus glaucus* ssp. *glaucus*), occur as a component of other plant communities. Non-native grassland has replaced the native vegetation in the urban areas. Non-native grasslands consist of bromes, wild oats, barley, ryegrass, and fescues. Non-native herbs such as filarees, mustards, burclover, and yellow star-thistle are also present in the grasslands. The non-native grasslands east of 20th Street are mowed.

3.7.1.6 Riparian Woodland

Riparian woodlands occur in several locations within the Cantonment Area. The riparian woodlands are dominated by arroyo willow (*Salix lasiolepis*) with Western poison oak, rushes, and California blackberry which form a canopy around intermittent creeks and channels. Cattails and tules grow in some channels.

The riparian corridors along 13th Street and in the recreational area north of Ocean View Avenue receive inputs of water from irrigation runoff. The riparian woodlands occurring near the recreational facility north and west of Ocean View Avenue, between 13th and Washington Avenue and north of California Boulevard, eventually drain into San Antonio River. The riparian woodlands near the trailer park along Highway 1 and those around the sanitary landfill on the south side of Pine Canyon Road drain into the Santa Ynez River.

3.7.1.8 Vernal Pool/Seasonal Wetland

Vernal pools and seasonal wetlands are ephemeral wetlands which occur in shallow depressions where there is a perched water table. The vernal pools and seasonal wetlands are dominated by grasses, including alkali ryegrass (*Leymus tridicoides*), Lemmon's canarygrass (*Phalaris lemmonii*), annual beard grass (*Polypogon monspeliensis*), and low barley (*Hordeum depressum*), rushes (*Juncus falcatus* var. *falcatus*, *J. phaeocephalus* var. *phaeocephalus*), and spikerush (*Eleocharis macrostachya*).

3.7.1.9 Rare, Threatened, or Endangered Plant Species

Several federal special-status plants occur in Burton Mesa Chaparral including seaside bird's beak (*Cordylanthus rigidus* spp. *littoralis*), Lompoc yerba santa (*Eriodictyon capitatum*), and Sand mesa or shagbark manzanita (*Arctostaphylos rudis*). Special-status plants that may be found in the vernal pools and seasonal wetland complexes include Blochman's dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*), southern tarplant (*Hemizonia parryi* ssp. *australis*), and Coulter's goldfields (*Lasthenia glabrata* ssp. *Coulteri*).

3.7.2 Wildlife Habitats

The varied habitats on Vandenberg AFB support a diverse population of wildlife. Tables 3.7-1, 3.7-2, and 3.7-3 present the state and federal status listings for special-status species known to occur on Vandenberg AFB. These habitat types and species are described briefly below.

3.7.2.1 Chaparral

Wildlife species associated with the Burton Mesa Chaparral include birds such as Bewick's wren, California quail, Spotted and California towhees, White-crowned and Song sparrows, and Anna's hummingbird; reptiles observed include western fence lizard, California horned lizard, and terrestrial garter snake; and mammals include brush rabbit, mule deer, coyote, long-tailed weasel, and American badger. Amphibians in chaparral vegetation include ensatina (*Ensatina eschscholtzi*), Pacific chorus frog (*Pseudacris regilla*), and the arboreal salamander (*Aneides lugubris*). Bell's sage sparrow (*Ainphispiza belli belli*) inhabits open chaparral and frequents previously burned areas.

3.7.2.2 Coastal Sage Scrub

Many of the wildlife species found in the chaparral communities also occur in coastal sage scrub. In addition to the wildlife found in chaparral, other species include mammals like Heerman's kangaroo rat (*Dipodomys heermanni*), Broad-footed mole (*Scapanus latimanus*), and birds such as California thrasher (*Toxostoma redivivum*) and Wrentit (*Chamaea fasciata*).

3.7.2.3 Urban and Exotic Vegetation

The urban and exotic vegetation found in the Cantonment Area supports a number of native arid introduced species. The trees and shrubbery planted for landscape purposes provide shelter and nesting sites for a number of animals. The introduced eucalyptus and Monterey pines planted as windbreaks provide roost and nest sites for raptors (e.g., Cooper's, Red-tailed and Red-shouldered hawks, American kestrels, and owls). Great blue heron rookeries have become established in a few of the trees. The eucalyptus groves also provide roost sites for the Monarch butterfly. The man-made structures provide habitat for various species of bats and swallows. Species of bats observed at Vandenberg AFB include Yuma myotis, pallid bat, and Townsend's big-eared bat.

Non-native grasslands are predominant in the modified areas of the base. California ground squirrels are common throughout the base. Birds observed in the non-native grasslands include Western meadowlark, Mourning dove, Scrub jay, Turkey vulture, Burrowing owl, and Red-winged and Brewer's blackbirds. Mountain plovers winter in the grasslands surrounding the airfield. The grasslands also provide habitat for California horned lizard.

TABLE 3.7-1
FEDERAL AND STATE THREATENED AND ENDANGERED SPECIES ON VANDENBERG AFB (PLANTS)

Species Common Name Scientific Name	Status ¹	Occurs on VAFB ²	Habitat	Blooming Period
La Graciosa thistle <i>Cirsium loncholepis</i>	FE / ST	Historical occurrence	Coastal dune swale wetlands, coastal salt marsh (brackish). No present locations on Vandenberg.	June – August
Surf thistle <i>Cirsium rhotophilum</i>	ST	O	Coastal dunes.	April – June
Seaside bird's-beak <i>Cordylanthus rigidus</i> ssp. <i>littoralis</i>	SE	O	Coastal dunes, chaparral. Primarily found in chaparral on Vandenberg.	May – September
Beach spectacle pod <i>Dithyrea maritima</i>	ST	O	Coastal dunes.	April – May
Lompoc yerba santa <i>Eriodictyon capitatum</i>	FE	O	Chaparral. Three locations on Vandenberg.	May – August
Gaviota tarplant <i>Deinandra [Hemizonia] increscens</i> ssp. <i>villosa</i>	FE / SE	O	Coastal bluffs, coastal scrub. Various locations on Vandenberg.	May – August
Beach layia <i>Layia carnosa</i>	FE / SE	O	Coastal dunes. Two locations on Vandenberg.	May – July
Gambel's watercress <i>Rorippa gambellii</i>	FE / ST	O	Freshwater marsh. One location on Vandenberg.	April – June

Notes:

- | | | |
|---|---|---|
| 1 | FE = Federally Endangered
FT = Federally Threatened
FD = Federally Delisted Species | SE = California Endangered
ST = California Threatened
CP = California fully protected |
| 2 | E = expected
O = observed | |

TABLE 3.7-2
FEDERAL AND STATE THREATENED AND ENDANGERED SPECIES ON VANDENBERG AFB (WILDLIFE)

Species Common Name Scientific Name	Status ¹	Occurs on VAFB ²	Seasonal Occurrence	Habitat	Breeding Season (VAFB Breeders only)	Additional Comments
Crustaceans						
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT	O	Vernal pool species	Vernal pools		Found in 80% of vernal pools in cantonment area in 2005
Fishes						
Unarmored threespine stickleback <i>Gasterosteus aculeatus williamsoni</i>	FE / SE	O	Year-round	Perennial streams	Year-round; peak in March	San Antonio Creek and Honda Creek only
Tidewater goby <i>Eucyclogobius newberryi</i>	FE	O	Year-round	Perennial streams, primarily coastal	Late April – early May	
Southern steelhead <i>Oncorhynchus mykiss</i>	FE	O	Winter, spring	Perennial streams with connection to ocean	Spawn Dec – May; peak Dec – Jan	Santa Ynez River; potential Honda and Jalama Creeks
Amphibians						
California red-legged frog <i>Rana aurora draytonii</i>	FT	O	Year-round, breeder	Perennial ponds and streams	February – mid April	Nearly all permanent lakes, streams and ponds on VAFB
Birds						
California brown pelican <i>Pelecanus occidentalis californicus</i>	FE / SE	O	Winter migrant; most abundant June – January	Near-shore waters, coastal bluffs, rock outcrops		
Bald eagle <i>Haliaeetus leucocephalus</i>	FT (FPD)/ SE	O	Migrant, winter	Large lakes and wetlands		
American peregrine falcon <i>Falco peregrinus anatum</i>	FD / SE	O	Year-round, breeding	Nest on cliffs, forage over all open habitats	Mid February – July	
Western snowy plover <i>Charadrius alexandrinus nivosus</i>	FT	O	Year-round, breeding	Coastal sandy beaches, dunes	March – September	VAFB supported over 20% of California population in 2004

TABLE 3.7-2 (CONTINUED)
FEDERAL AND STATE THREATENED AND ENDANGERED SPECIES ON VANDENBERG AFB (WILDLIFE)

Species Common Name Scientific Name	Status ¹	Occurs on VAFB ²	Seasonal Occurrence	Habitat	Breeding Season (VAFB Breeders only)	Additional Comments
California least tern <i>Sterna antillarum browni</i>	FE / SE	O	Migrant, breeder	Sand dunes near water	Mid April – August	Purisima Point, Santa Ynez Estuary, San Antonio lagoon
Little willow flycatcher <i>Empidonax traillii brewsteri</i>	SE	E	Migrant	Willow thickets and brushy swamps		
Southwestern willow flycatcher <i>Empidonax traillii extimus</i>	FE / SE	O	Migrant, breeder	Undisturbed willow riparian	Mid May – July	Santa Ynez River only
Belding's savannah sparrow <i>Passerculus sandwichensis beldingi</i>	SE	E	Year-round, potential breeder	Salt-marsh vegetation and coastal grassland	April – July	Santa Ynez River lagoon
Mammals						
Southern sea otter <i>Enhydra lutris nereis</i>	FT / CP	O	Year-round, breeding, migrant	Near shore waters, off rocky coastline, kelp beds	Year-round, peak December-March	Resident breeding colony near Purisima Point and Sudden Flats. Transients occasionally seen elsewhere off VAFB coastline

Notes:

- | | | |
|---|---|---|
| 1 | FE = Federally Endangered
FT = Federally Threatened
FD = Federally Delisted Species | SE = California Endangered
ST = California Threatened
CP = California fully protected |
| 2 | E = expected
O = observed | |

**TABLE 3.7-3
OTHER FEDERAL AND STATE SPECIAL STATUS SPECIES ON VANDENBERG AFB**

Species Common Name <i>Scientific Name</i>	Status ¹	Occurs on VAFB ²	Seasonal Occurrence	Habitat	Breeding Season (VAFB Breeders only)	Additional Comments
Insects						
Monarch butterfly <i>Danaus plexippus</i>	SA	O	Wintering	Monterey pine and Eucalyptus groves		
Fishes						
Arroyo chub <i>Gila orcutti</i>	CSC	O	Year-round	Streams and lakes		Introduced
Amphibians						
Western spadefoot <i>Spea hammondi</i>	CSC	O	Year-round, breeder	Grassland, vernal pools	Late January – March	
Reptiles						
Southwestern pond turtle <i>Clemmys marmorata pallida</i>	CSC	O	Year-round	Perennial lakes, ponds, streams; eggs laid in upland areas 16-400 meters from water	Can occur year-round; peak May – June	Hatchlings overwinter in nest; move to aquatic sites March-April
Coast horned lizard <i>Phrynosoma coronatum frontale</i>	CSC	O	Year-round	Most habitats on VAFB with loose substrates for burrowing	April – August	
Silvery legless lizard <i>Anniella pulchra pulchra</i>	CSC	O	Year-round	Sparsely vegetated coastal scrub and chaparral	May – June mating, Sep – Oct birth	
Birds						
Ashy storm-petrel (rookery site) <i>Oceanodroma homochroa</i>	BCC / CSC	O	Migrant, potential breeder	Near-shore waters, coastal bluffs, rock outcrops	February – October	
Western least bittern (nesting) <i>Ixobrychus exilis hesperis</i>	CSC	O	Migrant, potential breeder	Freshwater marshes, ponds, lakes with emergent vegetation	Late March – July	Punchbowl Lake

TABLE 3.7-3 (CONTINUED)
OTHER FEDERAL AND STATE SPECIAL STATUS SPECIES ON VANDENBERG AFB

Species Common Name <i>Scientific Name</i>	Status ¹	Occurs on VAFB ²	Seasonal Occurrence	Habitat	Breeding Season (VAFB Breeders only)	Additional Comments
White-faced ibis (rookery site) <i>Plegadis chihi</i>	CSC	O	Migrant	Freshwater marshes, ponds		Flock observed at Barka Slough
Cooper's hawk (nesting) <i>Accipiter cooperii</i>	CSC	O	Year-round, breeder	Wooded semi-open riparian habitats, agricultural fields	March – July	
Sharp-shinned hawk (nesting) <i>Accipiter striatus</i>	CSC	O	Migrant, winter	Semi-open wooded habitats, margins of open areas		
Golden eagle <i>Aquila chrysaetos</i>	FP / CSC	O	Year-round	Cliffs, large trees in open areas	January – August	
Ferruginous hawk (wintering) <i>Buteo regalis</i>	CSC	O	Migrant, winter	Open country, grassland, agricultural lands		
Northern harrier (nesting) <i>Circus cyaneus</i>	CSC	O	Year-round, Breeder	Open grassland, coastal sage scrub, marshes, agricultural areas	March – July	
Osprey (nesting) <i>Pandion Haliaeetus</i>	CSC	O	Rare migrant	Lakes, ponds, sloughs, river mouths, nearshore ocean waters		
Merlin (wintering) <i>Falco columbarius</i>	CSC	O	Rare winter migrant	Open grassland, agricultural areas, sloughs and beaches		
Mountain plover <i>Charadrius montanus</i>	BCC / CSC	O	Migrant, winter	Semi-arid plains, grassland and plateaus		Winters annually at airfield; no other known locations on VAFB
Black oystercatcher (nesting) <i>Haematopus bachmani</i>	BCC	O	Breeder	Rock outcrops, coastal bluffs		
Whimbrel <i>Numenius phaeopus</i>	BCC	O	Year-round	Beaches and coastal dunes		

TABLE 3.7-3 (CONTINUED)
OTHER FEDERAL AND STATE SPECIAL STATUS SPECIES ON VANDENBERG AFB

Species Common Name <i>Scientific Name</i>	Status ¹	Occurs on VAFB ²	Seasonal Occurrence	Habitat	Breeding Season (VAFB Breeders only)	Additional Comments
Long-billed curlew <i>Numenius americanus</i>	BCC / CSC	O	Year-round	Beaches and coastal dunes		
Marbled godwit <i>Limosa fedoa</i>	BCC	O	Year-round	Beaches and coastal dunes		
Rhinoceros auklet (nesting colony) <i>Cerorhinca monocerata</i>	CSC	O	Breeder	Rock outcrops, coastal bluffs	Undetermined	
Western burrowing owl <i>Athene cunicularia hypugea</i>	BCC / CSC	O	Potential breeder, winter migrant	Open, dry grassland	April – June	
Loggerhead shrike <i>Lanius ludovicianus</i>	BCC / CSC	O	Year-round, breeder	Semi-open country with posts, wires, trees, scrub	March – August	Common throughout most VAFB
California horned lark <i>Eremophila alpestris actia</i>	CSC	O	Year-round	Grassland, dunes, agricultural fields	March – July	
Yellow warbler (nesting) <i>Dendroica petechia brewsteri</i>	CSC	O	Migrant, breeder	Willow riparian woodland	March – July	
Yellow breasted chat (nesting) <i>Icteria virens</i>	CSC	O	Migrant, breeder	Dense willow riparian thicket, woodland	March – July	
Bell's sage sparrow <i>Amphispiza belli belli</i>	CSC	O	Year-round, breeder	Open chaparral	March – July	On VAFB, closely associated with successional (burned) habitat
Black-chinned sparrow <i>Spizella atrogularis</i>	BCC	O	Rare spring migrant	Scrub habitats		
Tricolored blackbird <i>Agelaius tricolor</i>	BCC / CSC	O	Year-round, breeder	Dense tule stands, fields, and pastures	March – July	
Lawrence's goldfinch <i>Carduelis lawrencei</i>	BCC	O	Migrant, breeder	Oak-pine woodland, chaparral	March – August	Shuman Creek, San Antonio Creek, Santa Ynez River

TABLE 3.7-3 (CONTINUED)
OTHER FEDERAL AND STATE SPECIAL STATUS SPECIES ON VANDENBERG AFB

Species Common Name <i>Scientific Name</i>	Status ¹	Occurs on VAFB ²	Seasonal Occurrence	Habitat	Breeding Season (VAFB Breeders only)	Additional Comments
Mammals						
Pacific western big-eared bat <i>Corynorhinus townsendii townsendii</i>	CSC	O	Year-round, potential breeding	Rocky outcroppings, and man made structures	Nov-Feb mating, young May-August	Upper Honda Canyon, Swordfish Cave, Shuman Creek
Greater western mastiff bat <i>Eumops perotis californicus</i>	CSC	E	Year-round, potential breeding	Cracks and holes in man made structures, trees	March-August	
Pallid bat <i>Antrozous pallidus</i>	CSC	O	Year-round, potential breeding	Rocky outcroppings, man made structures	Fall mating, young May-August	Upper Honda Canyon, Swordfish Cave, 13th & Santa Ynez River
Pacific harbor seal <i>Phoca vitulina richardii</i>	FP	O	Year-round, breeding, migrant	Coastal waters and rocky shorelines	February through May	

Notes:

- 1 BCC = Federal Bird of Conservation Concern
 FP = Federally protected (Bald and Golden Eagle Protection Act, Marine Mammal Protection Act)
 CSC = California Species of Concern
 SA = California special animal
- 2 E = expected
 O = observed

3.7.2.4 Riparian Woodland

Riparian habitats in California provide food, water, migration and dispersal corridors, and nesting and breeding habitat for a variety of wildlife species. Numerous amphibian, reptile, bird, and mammal species are found as residents and visitors in riparian habitats. Reptilian and amphibian species occurring in riparian corridors include garter snake, Western toad (*Bufo boreas*), Pacific chorus frog (*Pseudacris regilla*), and Western fence lizard (*Sceloporus occidentalis*). Avian species found in riparian habitats include house finch (*Carpodacus mexicanus*), Black phoebe (*Sayornis nigricans*), Spotted towhee (*Pipilo erythrophthalmus*), Red-shouldered hawk, and warblers. The federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*) has been observed in a willow riparian woodland on the Santa Ynez River, south of the study area.

Mammals known to occur in riparian habitats at Vandenberg AFB include Deer mouse (*Peromyscus maniculatus*), raccoon (*Procyon lotor*), California ground squirrel (*Spermophilus audubonii*), Striped skunk (*Mephitis mephitis*), Mule deer (*Odocoileus hemionus*), coyote, and feral pigs.

3.7.2.5 Vernal Pool/ Seasonal Wetland

These ephemeral wetlands provide breeding and foraging habitats for many wildlife species. Amphibians such as Pacific chorus frog, ensatina, Western spadefoot, and Western toad breed in wetland habitats. The Pacific chorus frog, which was frequently observed in these wet areas, provides an abundant food source for garter snake and raccoon, as well as egrets and herons.

3.7.3 Wetlands

3.7.3.1 Federal Regulations

The United States Army Corps of Engineers (Corps) and the USEPA regulate the discharge of dredge and fill material into “waters of the U.S.” under Section 404 of the Clean Water Act. The Corps will typically take jurisdiction over the portion of a project study area that contains waters of the U.S. and adjacent or isolated wetlands.

3.7.3.2 Definitions

The Corps jurisdiction over “waters of the U.S.” extends to the “ordinary high water mark provided the jurisdiction is not extended by the presence of wetlands” (33 CFR Part 328 Section 328.3). Wetlands, as defined by the Corps for regulatory purposes, are identified using a three parameter test that considers whether hydrophytic vegetation, hydric soils, and hydrology are present (Corps, 1987). Wetlands are “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and

that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR 328.3, 40 CFR 230.3). Wetlands also include less conspicuous wetland types such as vernal pools and other seasonal wetlands.

The U.S. Fish and Wildlife Service uses a different classification system for developing the National Wetlands Inventory (NWI) maps. The Cowardin system defines wetlands as:

Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soils; and (3) the substrate is nonsoil and is saturated with water or cover by shallow water at some time during the growing season of each year.

3.7.3.3 Wetlands Mapping on Base

A wetlands survey of the Cantonment area was conducted in association with the preparation of the Cantonment EA. The focus of the wetlands survey was to determine where wetland habitats occurred within the Cantonment Area. The wetland boundaries were identified primarily by the presence of hydrophytic vegetation. Saturated and/or inundated conditions were present in some wetland areas. Secondary indicators of hydrology (e.g., cracked soil, dried algal mats, and water stained leaves) were also observed. Soils were not analyzed to determine the presence of hydric conditions because the wetland survey was not a jurisdictional delineation. The area associated with the proposed project/action is not located within a wetland area according to the constraints maps contained in the Cantonment EA.

3.7.3.4 Riparian Woodlands

A riparian woodland is typically composed of two jurisdictional components, a wetland and waters of the U.S. The ‘waters’ component is a river, creek, stream, or drainage with a defined bed and bank. It is typically the main water source for the riparian vegetation associated with the waterway. The ‘wetland’ component is the vegetation that occurs along the bank of the waterway and extends outward from it.

Riparian woodlands occur in several locations within the Cantonment Area. The riparian woodlands are dominated by arroyo willow (*Salix lasiolepis*) with Western poison oak, rushes, and California blackberry which form a canopy around intermittent creeks and channels. Cattails and tules grow in some channels.

The riparian corridors along 13th Street and in the recreational area north of Ocean View Avenue receive inputs of water from irrigation runoff. The riparian woodlands occurring near

the recreational facility north and west of Ocean View Avenue, between 13th and Washington Avenue and north of California Boulevard, eventually drain into the San Antonio River. The riparian woodlands along Highway 1 and those around the sanitary landfill on the south side of Pine Canyon Road drain into the Santa Ynez River.

3.7.3.5 Vernal Pool/Seasonal Wetland

Vernal pools and seasonal wetlands are ephemeral wetlands which occur in shallow depressions where there is a perched water table. In the study area, the vernal pool/seasonal wetland complexes occur in relatively flat areas with micro-relief. The vegetation in the vernal pool seasonal wetland complexes is similar. Hydrology is the distinguishing characteristic: vernal pools are deeper depressions than seasonal wetlands and hold water for a longer period.

The majority of the soil types in the Cantonment Area are in the Tangair-Narlon association. The Narlon soils have a clay subsoil that forms a perched water table after heavy rains or irrigation. The Tangair soils are underlain by a shale or other very slowly permeable material which also can form a perched water table.

The vernal pool seasonal wetland complexes within the Cantonment Area are dominated by grasses, including alkali ryegrass (*Leymus tridicoides*), Lemmon's canarygrass (*Phalaris lemmonii*), annual beard grass (*Polypogon monspeliensis*), low barley (*Hordeum depressum*), rushes (*Juncus falcatus* var. *falcatus*, *J. phaeocephalus* var. *phaeocephalus*), and spikerush (*Eleocharis macrostachya*).

3.7.4 Project Site Conditions

Both the site of for the electrical substation and the four acre site proposed for the new SCF building have been previously disturbed. Both sites are not located in areas that have been identified as containing endangered, threatened, and/or sensitive species or habitats that would support these species types. A presence/absence biological survey was conducted in July 2006 on both the electrical substation site and SCF facility site for the purpose of identifying whether endangered, threatened or sensitive species are present on either site.

The survey area covered an estimated 17.4 acres. Along Washington Avenue the vegetation includes mature eucalyptus trees immediately adjacent to the roadway with mature pines, oaks, and manzanita shrubs in a belt adjacent to the eucalyptus trees. The remaining half of the survey area consists of grass lands with scattered oaks and manzanita shrubs. Most of the grasses and oats were dry at the time of the survey; however most plants remained in recognizable form. Native soils remain throughout the survey area. The soils were loose and comprised of sands and silts. Some evidence of previous soil disturbance was visible.

The proposed electrical sub-station site is located at the western corner of Airfield Road and Washington Avenue. The survey area at this location measured approximately 3.5 acres. A cluster of eucalyptus trees is found at the northwestern corner of the survey area with mature, head-high shrubs covering the majority of the site. The substrate of the proposed electrical sub-station area appeared to be non-native fill consisting of road base material with some patches of asphalt.

The following table presents a list of vegetation observed during the survey. This list is not an exhaustive accounting of vegetation present at the survey locations. Rather, it portrays the dominant species readily recognizable at the time of the survey.

- Western ragweed (*Ambrosia psilostachya*)
- Scarlet pimpernel (*Anagallis arvensis*)
- Sand mesa manzanita (*Arctostaphylos rudis*)
- Annual oats (*Avena* sp.)
- Coyote brush (*Baccharis pilularis*)
- Field mustard (*Brassica* sp.)
- Bindweed (*Calystegia* sp.)
- Iceplant (*Carpobrotus edulis*)
- Santa Barbara ceanothus (*Ceanothus impressus*)
- Tocalote (*Centaurea melitensis*)
- Pampas grass (*Cortaderia jubata*)
- Gaviota tarplant (*Deinandra increscens* ssp. *villosa*)
- Saltgrass (*Distichilis spicata*)
- Veldt grass (*Ehrharta calycina*)
- White-stemmed filaree (*Erodium moschatum*)
- Eucalyptus (*Eucalyptus* sp.)
- California cudweed (*Gnaphalium californicum*)
- Pink cudweed (*Gnaphalium ramosissimum*)
- Telegraph weed (*Heterotheca grandiflora*)
- Coast horkelia (*Horkelia cuneata* ssp. *cuneata*)
- Goldenbush (*Isocoma menziesii*)

- Brown headed rush (*Juncus phaeocephalus*)
- Deerweed (*Lotus scoparius*)
- Plantain (*Plantago* sp.)
- Monterey pine (*Pinus radiata*)
- Coast live oak (*Quercus agrifolia*)
- Redberry (*Rhamnus corcea*)
- Sheep sorrel (*Rumex acetosella*)
- Arroyo willow (*Salix lasiolepis*)
- Black sage (*Salvia mellifera*)
- Common sowthistle (*Sonchus oleraceus*)
- Poison oak (*Toxicodendron diversilobum*)

A population of Gaviota tarplant (*Deinandra increscens* ssp. *villosa*) was observed on the southeastern berm around the perimeter fencing of the 12000 Building, just to the north of the site for the proposed SCF facility. Figure 3.7-1, tarplant location onsite, identifies the location of the species found during the survey of the site. The population measures approximately 56 square feet (28 feet by 4 feet at the widest) and contained approximately 10 individual plants. The plants were flowering at the time of the survey. No other sensitive, threatened, or sensitive species were identified on either the electrical substation site or the site for the new SCF building.

FIGURE 3.7-1
TARPLANT LOCATION ONSITE
IN PREP

3.8 NOISE

The existing noise environment for the project sites associated with the proposed project/action is tiered from information contained in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the noise setting for the Cantonment Area. As applicable, additional information has been incorporated into this section to supplement and update the existing condition information as it relates to the project sites associated with the proposed project/action.

3.8.1 General Noise Information

Noise is usually defined as unwanted sound and can be an undesirable by-product of society's normal day-to-day activities. Sound becomes unwanted when it interferes with normal activities, causes actual physical harm, or has an adverse effect on health. The definition of noise as unwanted sound implies that it has an adverse effect or causes a substantial annoyance to people and their environment.

Noise is measured on a logarithmic scale of sound pressure known as a decibel (dB). Sound pressure level alone is not a reliable indicator of loudness because the human ear does not respond uniformly to sounds at all frequencies. For example, it is less sensitive to low and high frequencies than to medium frequencies that more closely correspond with human speech. In response to the human ear sensitivity, or lack thereof to different frequencies, the A-weighted noise level, referenced in units of dB(A), was developed to better correspond with people's subjective judgment of sound levels. In general, changes in a community noise level of less than 3 dB(A) are not typically noticed by the human ear.¹ Changes from 3 to 5 dB(A) may be noticed by some individuals who are extremely sensitive to changes in noise. An increase of greater than 5 dB(A) is readily noticeable, while the human ear perceives a 10 dB(A) increase in sound level to be a doubling of sound volume. A doubling of sound energy results in a 3 dB(A) increase in sound, which means that a doubling of sound wave energy (e.g., doubling the volume of traffic on a roadway) would result in a barely perceptible change in sound level.

When assessing community reaction to noise, a scale must be established which averages varying noise exposure over time and quantifies the result in terms of a single number descriptor. Several scales have been developed which address community noise levels. Those that are applicable to this analysis are the Equivalent Noise Level (L_{eq}) and the Day/Night Average Level (L_{dn}). L_{eq} is the average A-weighted sound level measured over a given time

¹ U.S. Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (Springfield, Virginia: U.S. Department of Transportation, Federal Highway Administration, September 1980), p. 81.

interval. L_{eq} can be measured over any time period. The L_{dn} is a measure of the 24-hour average noise level at a given location. The L_{dn} is calculated by averaging the L_{eq} for each hour of the day at a given location after penalizing the “sleeping hours” (defined as 10:00 PM to 7:00 AM) by 10.0 dB(A) to account for the increased sensitivity of people to noises that occur at night. The logarithmic effect of adding these penalties to a peak hour L_{eq} measurement typically results in a L_{dn} measurement that is within 3 dB(A) of the peak Hour L_{eq} .²

3.8.2 Existing Noise Environment

Existing noise levels at Vandenberg AFB are generally at or below 65 dB(A) L_{dn} , which is the generally accepted limit for outdoor noise levels in residential areas. Typical sources of noise include automobiles, trucks, and trains, with higher noise levels occurring near transportation routes and industrial facilities.

The airfield is the most important noise generator in the Cantonment area. Operating hours at the airfield are generally from 0800 – 1700 hours 5 days a week, which limits impact on the community and residential areas in the vicinity. Helicopter flights are also intermittent, and avoid residential and community areas, except in emergency situations. Periodic missile and rocket launches have a noticeable and temporary impact. Aircraft operations occurring at the airfield, helicopter overflights, and missile and rocket launches cause temporary elevated noise levels. However, the duration of these activities typically do not cause a measurable increase in the ambient noise environment on Vandenberg AFB.

3.8.3 Project Site Noise Setting

The proposed project site is located to the east of the airfield within the Cantonment Area. Noise contours generated by operations occurring at the adjacent airfield decrease as the distance from the airfield increases. The project site is also located outside of the 65 dB(A) L_{dn} noise contour that is generated by airfield operations. The facilities associated with the proposed project are not considered noise sensitive receptors.

² California Department of Transportation. A Technical Supplement to the Traffic Noise Analysis Protocol, October 1998.

3.9 TRAFFIC

The existing traffic conditions for the project sites associated with the proposed project/action is tiered from information contained in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the traffic conditions for the Cantonment Area. As applicable, additional information has been incorporated into this section to supplement and update the existing traffic conditions information as it relates to the project sites associated with the proposed project/action.

Vehicular traffic conditions are generally characterized in terms of Level of Service (LOS) shown with alphabetic designations ranging from LOS A (best) to LOS F (worst). The critical variables determining LOS are average speed, traffic density, and maximum service flow rate. Other variables include design speed and volume capacity ratio. For example, LOS A conditions would allow for almost unimpeded maneuverability, average speed at or near road design, and very low traffic density. At LOS, maneuverability is severely limited, substantial queuing occurs, and traffic density is relatively high. Under LOS E and F, conditions become substantially worsened to the extent that speeds are severely reduced below design speeds and extensive queues develop.

The street patterns within the Cantonment area are well developed to handle the various types of traffic generated by different land use types. Within the residential area, curves and cul-de-sacs have been designed to slow traffic and reduce traffic volumes so the noise and congestion are minimized and pedestrian safety is enhanced. The street pattern in the remainder of Cantonment area is modified grid with arterials that channel traffic to the north gate and to the residential area as well as along the east side of the industrial area. Traffic is well controlled by stop signs and traffic signals at major intersections. LOS in the Cantonment area ranges from LOS A to LOS C.

California Route 1, a four-lane limited access road, is the major highway that provides direct access to Vandenberg AFB, as well as the Cantonment area. Traffic volumes in the vicinity of the main gate tend to be relatively low, with some peak hour traffic of about 1,600 vehicles, average daily traffic during peak month of 17,100 vehicles, and average daily traffic on an annual basis of 16,100 vehicles. Peak hour traffic volumes are generally fairly low near the main gate, with an average of 1,600 trips during the AM or PM peak hour.

4.1 LAND USE

The land use impact analysis first summarizes the potential impacts and programmatic measures as identified in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the land use impacts and avoidance, minimization, and management practices for the Cantonment Area. Following this discussion, the analysis addresses specific environmental consequences of the proposed project/action and the No-action Alternative. Potential land use impacts attributable to the proposed project/action are based on information contained in the Cantonment EA, as well as additional sources of information as applicable. Any additional avoidance, minimization, and management practices that are necessary beyond those identified in the Cantonment EA are also identified in the analysis.

4.1.1 Summary of the Analysis Contained in the Cantonment EA

The land use analysis contained in the Cantonment EA identified potential project limitations based on three levels of land use constraints. Level 1 constraints include those areas with severe constraints that would prohibit and discourage development. Level 2 constraints include those areas with moderate constraints that do not necessarily prohibit development. Level 3 include those areas that have minimal constraints that can be easily resolve through available avoidance, minimization, and management practices. For a detailed discussion of the various constraint levels for the Cantonment Area, please refer to the Cantonment EA.

4.1.2 Programmatic Avoidance, Minimization, and Management Practices Identified in the Cantonment EA

Although no land use avoidance, minimization, and management practices were identified, further project level analysis was identified in the Cantonment EA depending on the location of future project sites.

4.1.3 Environmental Consequences of the Proposed Project/Action

According to the Constraints Map identified in the Cantonment EA,¹ the new SCF building and related structures are not located in Level 1, 2, or 3, environmental constraint areas. The site for the electrical substation is partially located in a Level 3 constraints area along the western perimeter. Level 3 constraints areas include those areas that have the potential to contain unexploded ordnances.

¹ 30 CES/CEVPP. Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg Air Force Base, California. October 1999. Figure 1-5.

The proposed substation site is located near a closed training and maneuvering area. While the proposed substation site is not located within an identified unexploded ordnances area as defined by the Military Munitions Response Program, 30th Space Wing Safety requires a walk-through survey prior to construction. This will be accomplished by the Explosive Ordnance Disposal (EOD) flight. Government and contractor personnel working on the site must be advised of the possibility of UXO discoveries. In case of an encounter, work shall cease and 30th Space Wing Safety will be contacted.

With the implementation of avoidance, minimization, and management practices pertaining to surveying for unexploded ordnances on the electrical substation site, the proposed project/action would not conflict with the environmental constraints areas identified in the Cantonment EA.

According to the land use classifications maps identified in the Cantonment EA, both the SCF site and the electrical substation site are located in open space areas. These areas are presently vacant and undeveloped. The only developed land use in the vicinity of the SCF building is an existing administrative building located just to the north of the site. The operations and activities occurring within the SCF building would not conflict with the operations occurring at the adjacent administrative building. The electrical substation would be constructed within a vacant and undeveloped area. The only developed land use is an administration building located to the south. As such, the electrical substation would not conflict with an existing land use or operations occurring in the area.

4.1.4 Environmental Consequences of the No-action Alternative

The No-action Alternative represents the circumstances that would occur if the proposed project/action were not constructed. If the No-action Alternative was selected both the SCF site and the electrical substation site would remain vacant and undeveloped. As a result, the No-action Alternative would not result in a land use conflict with surrounding land uses.

4.1.5 Avoidance, Minimization, and Management Practices

Prior to the commencement of construction activities on the electrical substation site, an unexploded ordnances survey shall be conducted by 30th Space Wing Safety. Should any unexploded ordnances be identified as a result of the survey, they will be removed and disposed of in accordance with Vandenberg AFB policies.

4.10 HAZARDOUS AND SOLID WASTE MANAGEMENT

The hazardous materials and waste impact analysis first summarizes the potential impacts and programmatic measures as identified in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the hazardous materials and waste impacts and avoidance, minimization, and management practices identified for the Cantonment Area. Following this discussion, the analysis addresses specific environmental consequences of the proposed project/action and the No-action Alternative. Potential hazardous materials and waste impacts attributable to the proposed project/action are based on information contained in the Cantonment EA, as well as additional sources of information as applicable. Any additional avoidance, minimization, and management practices that are necessary beyond those identified in the Cantonment EA are also identified in the analysis.

4.10.1 Summary of the Analysis Contained in the Cantonment EA

The hazardous materials and hazardous waste analysis contained in the Cantonment EA indicated that if facility planners consider the constraints identified by the General Plan, hazardous materials and solid waste management should not preclude the growth of Vandenberg AFB or result in significant impact.

4.10.2 Programmatic Avoidance, Minimization, and Management Practices Identified in the Cantonment EA

Avoidance, minimization, and management practices associated with hazardous materials and solid waste management may be considered in two major categories: 1) regulatory constraints, and 2) schedule for proposed facility construction. The location of hazardous materials and solid waste management activities are limited by the regulations and the type of facility.

4.10.3 Environmental Consequences of the Proposed Project/Action

There are potential impacts from hazardous materials and hazardous wastes during construction activities. Hazardous materials will be used during construction activities; therefore, there is the potential for incidents involving release of gasoline, diesel fuel, oil, hydraulic fluid, and lubricants from vehicles or other equipment or release of paints, solvents, or cleaning chemicals from construction activities. Managed and disposed of properly, hazardous materials used and stored, and hazardous wastes generated by the operation of the proposed project would not cause significant environmental impacts.

Solid waste produced during construction would include large rocks and vegetation removed from the construction area. Post construction waste such as concrete, asphalt and other items would also be removed from the construction area. The construction contractor would be

responsible for all solid waste disposal following the completion of construction activities. As a part of Vandenberg AFB's Solid Waste Management Program, a significant portion of all recyclable construction waste associated with the Proposed Project/Action would be separated for recovery and reuse. These recyclables include, but are not limited to, concrete, asphalt, and metals. Solid waste generated by construction activities associated with the Proposed Project/Action is expected to be minimal and consistent with other ongoing construction projects on the base. Compliance with Vandenberg AFB's Solid Waste Management Program will ensure that the proposed project would not cause significant environmental impacts.

4.10.4 Environmental Consequences of the No-action Alternative

The No-action Alternative represents the circumstances that would occur if the proposed project/action were not constructed. If the No-action Alternative was selected both the SCF site and the electrical substation site would remain vacant and undeveloped. As a result, the No-action Alternative requires the use of hazardous materials or hazardous wastes.

4.10.5 Avoidance, Minimization, and Management Practices

Due to the existing hazardous materials management and hazardous waste programs on Vandenberg AFB, no additional avoidance, minimization, and management practices are required.

4.11 UTILITIES

The utilities impact analysis first summarizes the potential impacts and programmatic measures as identified in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the utilities impacts and avoidance, minimization, and management practices identified for the Cantonment Area. Following this discussion, the analysis addresses specific environmental consequences of the proposed project/action and the No-action Alternative. Potential utilities impacts attributable to the proposed project/action are based on information contained in the Cantonment EA, as well as additional sources of information as applicable. Any additional avoidance, minimization, and management practices that are necessary beyond those identified in the Cantonment EA are also identified in the analysis.

4.11.1 Summary of the Analysis Contained in the Cantonment EA

According to the utilities analysis contained in the Cantonment EA, development associated with the 10 percent worst case growth scenario could impact existing utilities through increased usage subsequent to additional development or through damage during construction. Potential impacts due to increased usage of electrical power, natural gas, water, and sewage facilities are considered to be negligible because the existing infrastructure has the excess capacity to accommodate reasonably foreseeable development. Some communication systems within the study area could be impacted by increased usage, and stormwater drainage systems could be impacted by further development.

4.11.2 Programmatic Avoidance, Minimization, and Management Practices Identified in the Cantonment EA

Utilities should be repaired or upgraded as needed during any development within the Cantonment Area. In particular, potential impacts to communications systems and stormwater drainage systems should be assessed in order to design specific avoidance, minimization, and management practices. The Vandenberg AFB Planning Office should be consulted during the planning phase of any proposed development. Existing utilities should be located and marked prior to the initiation of any construction project.

4.11.3 Environmental Consequences of the Proposed Project/Action

As noted in Section 3.0, the facilities associated with the proposed project would be tied into existing infrastructure in the surrounding area in order to supply the new buildings with electrical, natural gas, communications, water, sewer, and drainage needs. The Proposed Project would not require significant increase in demand in excess of utility system capacity. Therefore, the proposed project would not impact the use of utilities.

4.11.4 Environmental Consequences of the No-action Alternative

The No-action Alternative represents the circumstances that would occur if the proposed project/action were not constructed. If the No-action Alternative was selected both the SCF site and the electrical substation site would remain vacant and undeveloped. As a result, the No-action Alternative would not result in adverse impacts.

4.11.5 Avoidance, Minimization, and Management Practices

No additional avoidance, minimization, and management practices are required.

4.12 HEALTH AND SAFETY

The health and safety impact analysis summarizes the potential impacts and programmatic measures as identified in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the health and safety impacts and avoidance, minimization, and management practices identified for the Cantonment Area. Following this discussion, the analysis addresses specific environmental consequences of the proposed project/action and the No-action Alternative. Potential health and safety impacts attributable to the proposed project/action are based on information contained in the Cantonment EA, as well as additional sources of information as applicable. Any additional avoidance, minimization, and management practices that are necessary beyond those identified in the Cantonment EA are also identified in the analysis.

4.12.1 Summary of the Analysis Contained in the Cantonment EA

The health and safety analysis contained in the Cantonment EA identified the fact that new construction or modification to existing facilities would require a review of the planned activity to insure that the intended areas within the Cantonment area are appropriate for the planned activity. Activities planned for IRP sites would require assessment for worker and community exposure potential. Activity and placement of facilities within explosive safety zones would require evaluation and concurrence of responsible authorities. Areas of unexploded ordnance would require clearance. Safety zones established for explosive and toxic hazards are established by Air Force regulation to protect personnel. Siting in areas with Level 1 constraints for these hazards would potentially have significant adverse impacts.

4.12.2 Programmatic Avoidance, Minimization, and Management Practices Identified in the Cantonment EA

Avoidance, minimization, and management practices for health and safety require potentially increased costs related to the installation of protective systems should decisions be made to place facilities or conduct activities which require protection of workers, the community or the facilities. Any construction or activity in the explosive safety zone would require either administrative relaxation of policies, special safety work practices and approved construction, or removal of the operation causing the impacted area to be listed as a safety zone.

4.12.3 Environmental Consequences of the Proposed Project/Action

The Proposed Project would comply with the OSHA, Cal-OSHA, AFOSH regulations, and other health and safety requirements and therefore would not cause significant health and safety impacts. Additionally, the sites associated with the proposed project/action are not located with identified explosive and toxic hazard areas within the Cantonment Area.

4.12.4 Environmental Consequences of the No-action Alternative

The No-action Alternative represents the circumstances that would occur if the proposed project/action were not constructed. If the No-action Alternative was selected both the SCF facility site and the electrical substation site would remain vacant and undeveloped. As a result, the No-action Alternative would not result in impacts to health and safety.

4.12.5 Management Practices

Since the Proposed Project/Action would comply with applicable health and safety requirements no additional avoidance, minimization, and management practices will be required.

4.2 SOCIOECONOMICS

The *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), serves as the basis for the impact analysis of the proposed project/action. The socioeconomic impact analysis first summarizes the potential impacts and programmatic measures as identified in the Cantonment EA. For a complete discussion regarding the socioeconomic impacts and avoidance, minimization, and management practices identified for the Cantonment Area please refer to the Cantonment EA. Following this discussion, the analysis addresses specific environmental consequences of the proposed project/action and the No-action Alternative. Potential socioeconomic impacts attributable to the proposed project/action are based on information contained in the Cantonment EA, as well as additional sources of information as applicable. Any additional avoidance, minimization, and management practices that are necessary beyond those identified in the Cantonment EA are also identified in the analysis.

4.2.1 Summary of the Analysis Contained in the Cantonment EA

The Cantonment EA addressed socioeconomic concerns associated with the future growth in the area and the potential impact on housing and schools both on and off the base. The analysis assumed a 10 percent increase in personnel within the Cantonment Area as a means to analyze future impacts to housing and the public school systems in the area. Based on the vacancy rates on the base at the time, as well as the vacancy rates in Lompoc and Santa Maria, it was concluded that the additional personnel increase associated with the Cantonment Plan could be accommodated by existing base housing or within the adjacent communities. No adverse impacts were identified.

The growth in personnel that was projected for the Cantonment Area would also lead to a corresponding increase in student populations. Based on conservative estimates, the growth occurring within the Cantonment Area was projected to have a corresponding increase in school-age children by approximately 173 students. It was concluded that the students would be distributed across a number of different schools in the area, and thus the impact was determined not to be significant.

4.2.2 Programmatic Avoidance, Minimization, and Management Practices Identified in the Cantonment EA

No avoidance, minimization, and management practices were identified in the Cantonment EA as no adverse impacts were identified.

4.2.3 Environmental Consequences of the Proposed Project/Action

The operation of the proposed project/action would result in personnel at the Onizuka Air Force Station (AFS) in Sunnyvale, California being relocated to Vandenberg AFB. On-base

housing consists of 2,200 units for accompanied personnel, quarters for approximately 400 unaccompanied personnel, and a trailer park located east of the main portion of the Cantonment area. The vacancy rate for the housing areas located on Vandenberg AFB is approximately 15 percent. The relocated personnel that would move to the base would likely utilize family housing and airmen dormitories. As there is sufficient occupancy in the Cantonment Area to support the relocation of personnel, no impacts are anticipated. Additionally, some personnel may choose live off base in one of the adjacent communities. As was previously presented in Section 3.2, there is sufficient vacancy rates in the surrounding community to support the limited number of personnel that may choose to live off base.

In addition, a number of school-age children would be relocated in association with the move of the base personnel to Vandenberg AFB. These students would be dispersed across numerous schools in the area depending on where they reside. Overall the impact of the proposed project/action on public school systems in the area is considered to be a less than significant.

4.2.4 Environmental Consequences of the No-action Alternative

The No-action Alternative would not generate any new personnel or school age children that would be relocated to Vandenberg AFB. Consequently, there would be no impacts to existing housing on the base or in the immediate area or impacts to public school systems.

4.2.5 Avoidance, Minimization, and Management Practices

No significant impacts were identified.

4.3 CULTURAL RESOURCES

The cultural resources impact analysis summarizes the potential impacts and programmatic measures as identified in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the cultural resources impacts and avoidance, minimization, and management practices identified for the Cantonment Area. Following this discussion, the analysis addresses specific environmental consequences of the proposed project/action and the No-action Alternative. Potential cultural resources impacts attributable to the proposed project/action are based on information contained in the Cantonment EA, as well as additional sources of information as applicable. Any additional avoidance, minimization, and management practices that are necessary beyond those identified in the Cantonment EA are also identified in the analysis.

Cultural resources are districts, sites, buildings, structures, and objects of cultural, historical, or archaeological significance. The National Historic Preservation Act (NHPA) of 1966 established the federal government's policy and programs on historic preservation, including the establishment of the National Register of Historic Places (National Register). Cultural resources that meet the eligibility criteria for inclusion in the National Register, which are found in the U.S. Department of Interior regulations at 36 CFR 60.4, are called "historic properties."

Section 106 of the NHPA requires that federal agencies take into account the effects of their undertakings on historic properties and consult with the State Historic Preservation Office (SHPO) and possibly the Advisory Council on Historic Preservation (ACHP) on these findings. In addition, federal agencies must consult with Indian tribal governments regarding potential adverse effects to cultural properties and tribal resources.

4.3.1 Summary of the Analysis Contained in the Cantonment EA

Evaluation of the implementation of the General Plan for the Cantonment Area assumed the implementation of the constraints maps, which identified, amongst other issues, the location of identified cultural resource sites. These constraints recommend the avoidance of documented archaeological sites, avoidance of identified properties of cultural importance to Native American tribes and preservation of the characteristics that contribute to the National Register eligibility of historic buildings and structures.

The Cantonment Area as a whole was noted to be heavily disturbed through years of basewide operations and also developed with facilities. These two factors result in the fact that previously undiscovered archaeological resources are likely to have been damaged or destroyed through ongoing operations on the base, though there is evidence of at least one potentially intact site near the headquarters building within the cantonment area.

Archaeological surveys were completed for the Cantonment Area in accordance with Section 106 of the NHPA in order to identify previously identified cultural resource areas within the Cantonment Area. The Cantonment Area EA recommended that sites containing known archaeological resources be avoided in order to minimize impacts on documented resources. Assuming that the areas identified as environmentally constrained by the location of sites of cultural significance are avoided, no adverse impacts were identified for development occurring in the Cantonment Area, therefore, the Air Force has determined that there is no adverse effect to cultural resources.

4.3.2 Programmatic Avoidance, Minimization, and Management Practices Identified in the Cantonment EA

As noted in the Cantonment EA, development occurring within areas identified as Level 3 constraints would not require avoidance, minimization, and management practices as sites of known cultural significance would be avoided. Projects proposed within Level 1 or 2 constrained areas containing historical or cultural features would require avoidance, minimization, and management practices. These measures, which would be determined on a case-by-case basis may include:

- Avoiding sites not determined to be not significant
- Monitoring of construction activities by a qualified archaeologist and Native American observer
- Compliance with Section 106 of the NHPA for eligible historic buildings

For a detailed discussion of the measures suggested for construction occurring within Level 1 or 2 constraints areas please refer to the Cantonment Area EA.

4.3.3 Environmental Consequences of the Proposed Project/Action

The Cantonment Area EA involved the evaluation of areas within the Cantonment Area for the purpose of identifying appropriate areas for development. A list of sites identified during literature reviews and file searches was compiled in order to identify areas constrained by sites of potential cultural significance. Identified sites of cultural significance were identified as Level 1 or 2 constraints areas within the Cantonment Area EA. The sites proposed for development in association with the proposed action are not located in either Level 1 or Level 2 constraints areas. As such, the sites proposed for development do not contain known sites of cultural significance or existing buildings that could be considered of historical significance according to Section 106 of the NHPA.

In association of the Requirements Document prepared for the proposed action, database searches and a review of basewide GIS data was conducted for the sites associated with the proposed action. No known sites of cultural or historical significance were identified on any

of the sites proposed for development. However, it is recommended that due to the fact that Chumash Indians and later historic peoples were located in the area, there is a possibility that undetected artifacts or features could be present within the project boundaries. Standard avoidance, minimization, and management practices related to the accidental discovery of archaeological resources during site construction activities are recommended below. With the implementation of the measures identified below, no adverse impacts to cultural resources will occur in association with the proposed action.

4.3.4 Environmental Consequences of the No-action Alternative

The No action Alternative would not result in adverse impacts to cultural resources due to the fact that no earth disturbing activities would occur.

4.3.5 Avoidance, Minimization, and Management Practices

If archaeological artifacts are unearthed or exposed during construction, all ground-disturbing work in the vicinity shall stop immediately, and the artifacts and the site shall be evaluated by an experienced archaeologist and a Native American representative. An appropriate plan for the evaluation of the artifacts from the site shall be prepared and its implementation overseen by a qualified archaeologist, prior to the restarting of ground-disturbing work at the project site.

4.4 EARTH RESOURCES

The earth resources impact analysis summarizes the potential impacts and programmatic measures as identified in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the earth resources impacts and avoidance, minimization, and management practices identified for the Cantonment Area. Following this discussion, the analysis addresses specific environmental consequences of the proposed project/action and the No-action Alternative. Potential earth resources impacts attributable to the proposed project/action are based on information contained in the Cantonment EA, as well as additional sources of information as applicable. Any additional avoidance, minimization, and management practices that are necessary beyond those identified in the Cantonment EA are also identified in the analysis.

4.4.1 Summary of the Analysis Contained in the Cantonment EA

The earth resources analysis contained in the Cantonment EA identified potential project limitations based on development in locations where geologic hazards exist or would require additional study and design and construction features to minimize the exposure of Vandenberg AFB personnel and structures to potential geologic hazards including landslides/erosion, seismicity, surface rupture, and liquefaction. No significant impacts were anticipated with the implementation of site specific design features.

4.4.2 Programmatic Avoidance, Minimization, and Management Practices Identified in the Cantonment EA

According to the Cantonment EA the potential for landslides and erosion should be assessed prior to development on or near any slopes of 15 percent or greater. Structural designs of proposed facilities must consider the potential for seismic activity and liquefaction. Best management practices should be followed during any construction to minimize soil erosion. Soil erosion procedures such as sediment basins, sediment fences, revegetation or diversion, and staked bales should be used during construction and demolition activities. During dry periods, water sprays should be used to prevent soil erosion by wind.

4.4.3 Environmental Consequences of the Proposed Project/Action

The sites proposed for the new SCF building and supporting electrical substation are not located in areas that exhibit unusual or adverse geologic conditions. The Tangair-Narlon association soils tend to exhibit expansive soil conditions due to the soil characteristics. However, the new SCF building has been designed to account for the site specific soil characteristics and other factors in order to eliminate adverse impacts that could result from expansive soils.

Construction of the facilities associated with the proposed project could expose people or structures to adverse effects involving strong seismic ground shaking. This is due to the fact that the sites associated with the proposed project, as well as Vandenberg AFB as a whole, are located in a seismically active area. If the proposed buildings were not properly designed, building occupants could be subject to serious injury or death if a strong seismic event were to occur on a nearby fault. However, the design of the facility has taken into account seismic factors that are present on the site and Vandenberg AFB. Compliance with standard design and construction methods will avoid adverse impacts resulting from a seismic event and groundshaking.

The project site is not located adjacent to any steep slopes. Additionally, there is little to no elevation change on the project site. In the absence of significant ground slopes, the potential for landslides is not considered to be an adverse impact.

Liquefaction is the sudden decrease in shearing strength of cohesionless soils due to vibration. During dynamic or cyclic shaking, the soil mass is distorted, and interparticulate stresses are transferred from the sand grains to the pore water. When the pore water pressure increases to the point that the interparticulate effective stresses are reduced to zero, the soil behaves temporarily as a viscous fluid (liquefaction) and, consequently, loses its capacity to support the structures built upon the soil. As noted earlier, no areas of Vandenberg AFB are known to have the potential for liquefaction. The new SCF building has been designed to account for the site specific soil characteristics and other factors in order to eliminate adverse impacts that could result from liquefaction.

4.4.4 Environmental Consequences of the No-action Alternative

The No-action Alternative represents the circumstances that would occur if the proposed project/action were not constructed. If the No-action Alternative was selected both the SCF facility site and the electrical substation site would remain vacant and undeveloped. As the new facilities would not be constructed, there would not be a risk of adverse impacts associated with geologic conditions found in the area.

4.4.5 Avoidance, Minimization, and Management Practices

All site specific geologic and soil measures identified to avoid potential adverse impacts shall be implemented.

Soil erosion procedures such as sediment basins, sediment fences, revegetation or diversion, and staked bales should be used during construction and demolition activities. During dry periods, water sprays should be used to prevent soil erosion by wind.

4.5 WATER RESOURCES

The water resources impact analysis summarizes the potential impacts and programmatic measures as identified in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the water resources impacts and avoidance, minimization, and management practices identified for the Cantonment Area. Following this discussion, the analysis addresses specific environmental consequences of the proposed project/action and the No-action Alternative. Potential water resources impacts attributable to the proposed project/action are based on information contained in the Cantonment EA, as well as additional sources of information as applicable. Any additional avoidance, minimization, and management practices that are necessary beyond those identified in the Cantonment EA are also identified in the analysis.

4.5.1 Summary of the Analysis Contained in the Cantonment EA

The water resources analysis contained in the Cantonment EA identified potential increased water use during and after construction activities. It did not identify impacts on water quality and quantity of surface waters and groundwater. Because water resources for potable water are located outside the Cantonment Area, significant impacts on water resources were not anticipated.

4.5.2 Programmatic Avoidance, Minimization, and Management Practices Identified in the Cantonment EA

Best management practices should be followed during any construction to minimize soil erosion and runoff into nearby creeks. Soil erosion control procedures such as sediment basins, sediment fences, re-vegetation or diversion, and staked bales should be used during construction and demolition activities.

4.5.3 Environmental Consequences of the Proposed Project/Action

The Proposed Project is not located in an area that is prone to flooding or could be adversely affected by a body of water. As a result, the construction of the new SCF building would not expose individuals to adverse impacts resulting from flooding. Standard soil erosion control measures will be implemented in order to minimize soil erosion occurring during construction activities and as a result of the operation of the proposed project. Water use at the new facility would utilize water allocated to Vandenberg AFB through Coastal Branch Aqueduct of the State Water Project. Sufficient supplies have been identified by the base to support the new SCF building. Implementation of standard stormwater control measures and the proposed stormwater filtration system will mitigate potential impacts associated with surface water runoff occurring during storm events. Overall, the proposed project would not have adverse impacts on water resources.

The Proposed Project/Action would disturb a land area of greater than 5 acres. As such, a National Pollutant Discharge Elimination System (NPDES) General Permit is required to protect water resources. The NPDES General Permit requires that a Stormwater Pollution Prevention Plan (SWPPP) that identifies sources of sediment and other pollutants in order to: 1) reduce or eliminate stormwater and non-stormwater discharges associated with construction activities, and 2) minimize impacts to water resources by ensuring water discharged from the construction site meets water quality standards at the point of discharge. All NPDES permit requirements would be implemented to reduce water quality impacts associated with construction activities occurring on the project site.

Construction activities would include the use of hazardous materials that could result in adverse impact to water resources if not properly controlled and managed. Proper storage, secondary containment, and spill prevention measures would be implemented for the duration of the construction activities to prevent the accidental introduction of any hazardous waste into the environment. The contractor's Environmental Protection Plan would address these environmental compliance issues, along with pollution prevention practices in order to reduce impacts and ensure compliance with the NPDES General Permit.

The Proposed Project would feature a liquid hydrocarbon filtration bed in the storm water capture system around the three antennas. The concrete surface surrounding the antennas and the waveguide trenches will direct the storm water to drainpipes. The system will connect to the drainpipes that direct the captured water into a filtration bed containing hydrophobic granules. The drainpipes would be no larger than six inches in diameter. The in-ground bed would be fabricated from concrete or fiberglass and provide screening to remove leaves, twigs or other debris from the storm water before it enters the filtration bed. The purpose of the hydrophobic granule filtration system is to absorb any liquid hydrocarbons that may lay on the surface of the concrete surrounding the three antennas while passing the filtered storm water. The filtered storm water would be permitted to percolate into the ground at nearby ground swales. The filtration bed would be no smaller than eight feet by eight feet and covered by cast iron or fiberglass grates. It would contain no less than 100 cubic feet of hydrophobic granules with appropriate screening and ballast to prevent silt from plugging the bed. It would be of sufficient depth to contain fifty gallons of liquid hydrocarbons above the filter bed in the event of a spill.

4.5.4 Environmental Consequences of the No-action Alternative

The No-action Alternative represents the circumstances that would occur if the proposed project/action were not constructed. If the No-action Alternative was selected both the SCF facility site and the electrical substation site would remain vacant and undeveloped. As a result, the No-action Alternative would not result in impacts to water resources.

4.5.5 Avoidance, Minimization, and Management Practices

Soil erosion control procedures such as sediment basins, sediment fences, re-vegetation or diversion, and staked bales should be used during construction and demolition activities.

Additional best management practices associated with the conveyance of surface water runoff shall be implemented in association with the proposed project.

4.6 AIR QUALITY

The air quality impact analysis summarizes the potential impacts and programmatic measures as identified in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the air quality impacts and mitigation measures identified for the Cantonment Area. Following this discussion, the analysis addresses specific environmental consequences of the proposed project/action and the No-action Alternative. Potential air quality impacts attributable to the proposed project/action are based on information contained in the Cantonment EA, as well as additional sources of information as applicable. Any additional mitigation measures that are necessary beyond those identified in the Cantonment EA are also identified in the analysis.

4.6.1 Summary of the Analysis Contained in the Cantonment EA

The analysis of potential air quality impacts associated with the buildout of the Cantonment Area identified the potential for construction and operational emissions. Future emission estimates were based on a 10 percent growth assumption within the area. Future growth and the corresponding increase in emissions were evaluated based on local Santa Barbara County Air Pollution Control District (SBAPCD) standards as well as federal regulations (as identified in SBAPCD Rule 702).

The analysis contained in the Cantonment EA concluded that future growth in the area would not result in an impact when compared to SBAPCD standards with the implementation of measures to reduce PM₁₀ and O₃ emissions. A formal air conformity analysis was conducted for the buildout assumption to ensure the compliance with federal regulations, as stated in SBAPCD Rule 702. At the time Santa Barbara County, was a federal non-attainment area for O₃. As such, federal regulations required that the total annual emissions of O₃ associated with the buildout of the Cantonment Area not exceed 50 tons per year. The estimate annual emissions were found to be below the federal 50 ton per year threshold. Therefore, the analysis concluded that the buildout of the Cantonment Area was exempt from further conformity analyses pursuant to federal regulations and would be in conformity with the Clean Air Act Amendments.

4.6.2 Programmatic Avoidance, Minimization, and Mitigation Measures Identified in the Cantonment EA

The Cantonment EA identified mitigation measures to reduce PM₁₀ emissions during construction activities occurring within the area to protect regional air quality. The mitigation measures, which are included below, were intended to avoid potentially significant air quality impacts.

- During construction, water trucks or sprinkler systems would be used to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. At a minimum, this mitigation would include wetting down such areas in the later morning and after work is complete for the day. Water would be more frequent whenever the wind speed exceeds 15 miles per hours.
- Vehicle speed on the disturbed area would be no more than 15 miles per hour.
- Any imported, exported, and stockpiled fill material would be covered or kept moist. All trucks transporting material would be tarped from the point of origin.
- The contractor's foreman would be responsible for implementing and monitoring the mitigation measures. The mitigation measures would also be noted on the grading and building plans.

4.6.3 Environmental Consequences of the Proposed Project/Action

4.6.3.1 Construction Emissions

Development of the proposed project/action would involve site grading, installation of utilities, construction of the proposed new buildings, and post-construction clean up. During this time, onsite stationary sources, heavy-duty construction vehicles, construction worker vehicles, and energy use would generate emissions. In addition, fugitive dust would be generated by site preparation and construction activities. The amount of equipment and number of employees would vary with each construction phase and construction activity depending on the intensity of the action.

The SBAPCD has not established any thresholds of significance for short-term construction emissions, but informally uses a threshold of 25 tons per year for evaluating the significance of construction emissions of these pollutants. This informal threshold of 25 tons per year has been converted into a daily emissions threshold of 192 pounds per day for this analysis. Estimates of emissions associated with construction of the proposed project have been calculated using the URBEMIS 2002 Air Quality Model.

Input assumptions utilized in the URBEMIS 2002 air quality modeling were obtained from preliminary grading information and development plans, and reasonable assumptions regarding the project. Where information was not available, model default assumptions were used. Table 4.6-1 identifies the worst-case, daily emissions associated with the development of the project. These estimates are based on the expected location, size, and development of the project, as well as the assumption that construction activities would utilize standards SBAPCD dust abatement measures.

As is identified in Table 4.6-1, emissions generated during the construction of the proposed project/action would not exceed the SBAPCD significance thresholds assuming the

**TABLE 4.6-1
ESTIMATED CONSTRUCTION EMISSIONS**

Emissions Source	Emissions			
	ROG	NO _x	SO _x	PM ₁₀
Site Grading (Maximum Pounds per Day)	9.15	61.69	0.00	37.61
SBAPCD Significance Threshold (Pounds per Day)	192.00	192.00	192.00	192.00
Exceeds Threshold?	No	No	No	No
Building Construction (Maximum Pounds per Day)	3.95	24.91	0.01	1.00
SBAPCD Significance Threshold (Pounds per Day)	192.00	192.00	192.00	192.00
Exceeds Threshold?	No	No	No	No

implementation of standards dust abatement (PM₁₀) mitigation measures, which are listed below.

4.6.3.2 Operational Emissions

According to the SBAPCD thresholds of significance, a project would not have a significant air quality effect on the environment if operation of the project would:

- Emit (from all sources, both stationary sources and mobile sources) less than 240 pounds per day of ROG and NO_x, and less than 80 pounds per day of PM₁₀
- Emit less than 25 pounds per day of NO_x or ROG from motor vehicle trips only

Operational emissions would be generated by both stationary and mobile sources as a result of normal day-to-day activity on the project site after occupation. Stationary emissions would be generated by the consumption of natural gas for space and water heating devices. Mobile emissions would be generated by the motor vehicles traveling to and from the project site. Daily operational emissions were calculated using the URBEMIS 2002 air quality model. The predicted emissions are based upon the buildout and occupancy of the new SCF building. Table 4.6-2 shows the anticipated operational emissions for the proposed project.

As is identified in Table 4.6-2, operational emissions generated by the proposed project/action after buildout will not exceed SBAPCD thresholds for all sources, both stationary and mobile, generated by the project. Additionally, vehicular emissions generated by the proposed project/action would not exceed 25 pounds per day. Therefore, the project will result in less than significant operational impacts on local and regional air quality.

As noted earlier, the evaluation of the Cantonment Area growth previously analyzed in the Cantonment EA required a formal air conformity analysis in association with the Clean Air Act and SBAPCD Rule 702, General Conformity due to the fact that the air basin was listed

**TABLE 4.6-2
OPERATIONAL EMISSIONS**

Emissions Source	Emissions		
	ROG	NO _x	PM ₁₀
Vehicular Source (Pounds per Day)	7.72	10.89	10.11
Stationary Sources (Pounds per Day)	0.68	0.31	0.00
Total Emissions (Pounds per Day)	8.40	11.20	10.11
SBAPCD Recommended Threshold	240.00	240.00	80.00

as federal nonattainment area for O₃. As is identified in the Section 3.6, all of the criteria air pollutants in the South Central Coast Air Basin, including O₃, are in attainment according to federal standards. Thus, a formal air conformity evaluation is not required for the proposed project/action.

4.6.4 Environmental Consequences of the No-action Alternative

The No-action Alternative would represent the conditions that would occur if the proposed project/action were not constructed. If the proposed project/action were not constructed, no construction or operational emissions would be generated.

4.6.5 Avoidance, Minimization, and Management Practices

In addition to the compliance with the Programmatic Avoidance, Minimization, and Management Practices identified in the Cantonment EA, the following measures are required to be implemented in association with construction activities for the purposed of reducing PM₁₀ emissions.

A dust abatement program shall be prepared and implemented during all construction activities occurring on the project site. The following measures shall be included in the dust abatement program:

- Sprinkle all construction areas with water (recycled when possible) at least twice a day, during excavation and other ground-preparing operations, to reduce fugitive dust emissions.
- Construction sites shall be watered and all equipment cleaned in the morning and evening to reduce particulate and dust emissions.
- Cover stockpiles of sand, soil, and similar materials, or surround them with windbreaks.
- Cover trucks hauling dirt and debris to reduce spillage onto paved surfaces or have adequate freeboard to prevent spillage.

- Post signs that limit vehicle speeds on unpaved roads and over disturbed soils to 10 miles per hour during construction.
- Soil binders shall be spread on construction sites, on unpaved roads, and on parking areas; ground cover shall be re-established through seeding and watering.
- Sweep up dirt and debris spilled onto paved surfaces immediately to reduce re-suspension of dust through vehicle movement over those surfaces.
- Require the construction contractor to designate a person or persons to oversee the implementation of a comprehensive dust control program and to increase watering, as necessary.

4.7 BIOLOGICAL RESOURCES

The biological resources impact analysis summarizes the potential impacts and programmatic measures as identified in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the biological resources impacts and avoidance, minimization, and management practices identified for the Cantonment Area. Following this discussion, the analysis addresses specific environmental consequences of the proposed project/action and the No-action Alternative. Potential biological resources impacts attributable to the proposed project/action are based on information contained in the Cantonment EA, as well as additional sources of information as applicable. Any additional avoidance, minimization, and management practices that are necessary beyond those identified in the Cantonment EA are also identified in the analysis.

4.7.1 Summary of the Analysis Contained in the Cantonment EA

The Cantonment EA notes that much of the special-status plants and sensitive communities in the area have been removed as a result of past activities in the area. However, several undisturbed areas, such as the field north of California Boulevard and Ocean View Avenue, are known to support sensitive plant communities, such as the Burton Mesa Chaparral. The EA notes that if development within the area avoids areas known to contain special-status plants or sensitive communities, no significant adverse impacts associated with development in the Cantonment Area would occur.

Special status wildlife species have been observed within the Cantonment area. The Cantonment EA notes that construction could result in the take of individual special-status wildlife species, such as the disruption of nesting raptors or migratory birds and loss of habitat. However, if development within the Cantonment Area does not occur in locations where special-status wildlife have been identified in the past, no adverse impacts would occur.

Wetlands and waters of the U.S. were identified within the Cantonment Area. However, assuming development within the Cantonment Area does not occur in locations where potential wetlands or waters of the U.S. have been mapped, it was concluded that no significant adverse impacts would occur.

4.7.2 Programmatic Avoidance, Minimization, and Management Practices Identified in the Cantonment EA

The Cantonment EA notes that the primary avoidance, minimization, and management practices to protect areas occupied by special-status plant species, animal species, wetlands or waters of the U.S. is avoidance. The constraints maps included within the EA identify areas that are known to contain wetlands and threatened and endangered species or habitats.

These areas are identified as Level 1 Constraints. Level 2 Constraints identify special-status and candidate species locations and habitats. The EA recommends avoidance of these areas as the primary means to eliminate impacts. The proposed project/action is not located within Level 1 or 2 Constraints areas as identified in the Cantonment EA.

4.7.3 Environmental Consequences of the Proposed Project/Action

4.7.3.1 Biological Resource Impacts

Federal agencies are required by Section 7 of the Endangered Species Act to assess the effect of any project on federally listed threatened and endangered species. Under Section 7, formal consultation with the USFWS is required for federal projects if such actions could directly or indirectly affect listed or proposed to be listed species. It is Air Force policy to follow management goals and objectives specified in the Integrated Natural Resources Management Plans and to consider special status species, sensitive communities, and habitats recognized by individual states and local agencies when evaluating impacts of a project. Impacts to biological resources are considered significant if special status species (endangered, threatened, rare or candidate) or their habitats, as designated by federal, state, or local agencies, would be affected directly or indirectly by project-related activities. In addition, impacts to biological resources are considered significant if substantial loss, reduction, degradation, disturbance, or fragmentation would occur in native species habitats or in their populations.

As noted in Section 3.7, a presence/absence biological survey was conducted in July of 2006 on both the electrical substation site and SCF facility site for the purpose of identifying whether endangered, threatened or sensitive species are present on either site. A survey of the area noted that the vegetation adjacent to Washington Avenue consisted of mature eucalyptus, pine, and oak trees. Manzanita shrubs were found adjacent to the eucalyptus stand. The majority of the survey area consists of grass lands with scattered oaks and Manzanita shrubs. Soils and vegetation found on the project site indicated some evidence of previous disturbance.

The only endangered, threatened, or sensitive species noted in the survey of both sites was a population of Gaviota tarplant (*Deinandra increscens* ssp. *villosa*), which was observed along the southeastern berm around the perimeter fencing of the 12000 Building, just to the north of the site for the proposed SCF facility. The location of the Gaviota Tarplant was previously identified in Figure 3.7-1. The location of the population is along the fenceline of the existing 12000 Building. The new SCF building would be constructed to the south of the Gaviota Tarplant population and would not require it to be removed or otherwise impacted. Measures are identified below that would ensure that the existing Gaviota Tarplant population would not be harmed or impacted in any way in association with the proposed project/action.

4.7.3.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the US Fish and Wildlife Service (USFWS). While the MBTA has no provision for allowing take incidental to construction, it is recognized by the USFWS that some birds and/or nests may be impacted un-intentionally by construction activities and operations even when reasonable measures are taken to avoid impacts.

The proposed action would include removal of approximately 12 acres of native vegetation and eucalyptus trees within the project area. Currently, this area provides marginal habitat for migratory birds for loafing, feeding, and nesting. No large concentrations of birds have been observed in this area. Construction activities including earthwork, other heavy equipment and vehicle traffic, and construction of the facility may temporarily discourage some nesting in the immediate vicinity, but may enhance habitat for edge dependent species. Overall, the proposed action would not result in significant long-term impacts to migratory bird populations or habitat though it may temporarily alter feeding and nesting behavior of individual or pairs of some species of birds within the project site and immediate vicinity.

In order to further minimize potential impacts to migratory birds, best management practices listed in Section 4.7.5 will be implemented in association with construction activities occurring on the project site.

4.7.3.3 Jurisdictional Waters

Impacts to jurisdictional waters of the United States and wetlands would be considered significant if the project resulted in net loss of wetland areas or habitat value, either through direct or indirect impact to wetland vegetation, loss of habitat for wildlife, degradation of water quality, or alterations in hydrological function. The U.S. Army Corps of Engineers (Corps) and the U.S. EPA have been given jurisdiction to implement Section 404 of the Clean Water Act, which regulates activities that would impact waters of the United State and wetlands. All projects that would involve the discharge or fill into jurisdictional waters or wetlands require a Section 404 permit from the Corps.

According to Figure 3-7 contained in the Cantonment EA, neither site associated with the proposed project/action contain wetlands, streams or other areas that are considered “Waters of the United States” according to the Clean Water Act. As such, development of the proposed project/action would not result in an impact to jurisdictional waters.

4.7.4 Environmental Consequences of the No-action Alternative

The No-action Alternative would result in the sites associated with the proposed project/action remaining vacant and undeveloped. Thus, there would be no potential impacts to biological resources associated with the No-action Alternative.

4.7.5 Avoidance, Minimization, and Management Practices

The low growing grasses and trees located on the project site could provide marginal nesting sites for ground nesting bird species. Therefore, if construction occurs during the nesting season (February – September) the following avoidance, minimization, and management practices will be implemented:

- Prior to start of construction, Vandenberg AFB Natural Resources personnel will inspect the site and surrounding areas to determine if protected birds are nesting within the construction site. If migratory bird nests are detected within the project site, natural resources personnel will confer with the US Fish and Wildlife Service, Migratory Bird Office and secure appropriate approval and permits to relocate or impact nests.
- When and where feasible, sustained heavy equipment operation and haul routes that may disturb nesting birds outside the project site may be routed to minimize disturbance. Buffers of 300 feet for ground nesting bird nests and 500 feet for raptor nests should be maintained when and where feasible.
- If during construction, dead or injured birds or destroyed nests are observed in the project site, ground disturbing activities shall cease and the contractor will notify Vandenberg AFB natural resources personnel for appropriate disposition and re-assessment of activities.

4.8 NOISE

The noise impact analysis summarizes the potential impacts and programmatic measures as identified in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the noise impacts and avoidance, minimization, and management practices identified for the Cantonment Area. Following this discussion, the analysis addresses specific environmental consequences of the proposed project/action and the No-action Alternative. Potential noise impacts attributable to the proposed project/action are based on information contained in the Cantonment EA, as well as additional sources of information as applicable. Any additional avoidance, minimization, and management practices that are necessary beyond those identified in the Cantonment EA are also identified in the analysis.

4.8.1 Summary of the Analysis Contained in the Cantonment EA

The Cantonment EA identified potential noise impact concerns arising from construction activities generating temporary increases in ambient noise levels and placement of noise sensitive receptors in the proximity of the airfield. Although construction noise would not affect uses outside the base, construction occurring within the Cantonment Area could potentially affect noise sensitive land uses. However, noise impacts were found to be less than significant impacts based on the compliance with noise restrictions requirements intended to protect construction workers as administered by the Occupational Safety and Health Administration guidelines. Additionally, noise generating construction activities would be limited to daylight hours to avoid impacting noise sensitive land uses.

Operations occurring in association with the airfield could result in land use incompatibilities within the Cantonment Area. The Cantonment Area identifies three levels of noise constraints based on the proximity to the airfield. Project sites located within areas identified as Level 1 constraints (75 dB(A) L_{dn} or greater) are anticipated to result in significant impact. Level 2 constraints areas are identified as having noise levels in the range of 65-75 dB(A) L_{dn} . Most land use activities are considered acceptable within Level 2 constraint areas, with the exception of residential and public areas. Level 3 constraints areas have no noise constraints as typical noise levels are below 65 dB(A).

4.8.2 Programmatic Avoidance, Minimization, and Management Practices Identified in the Cantonment EA

The Cantonment EA does not identify specific avoidance, minimization, and management practices that are intended to avoid noise impacts. However, future project sites located within Level 1 or 2 noise constraints areas require further analysis in relation to noise compatibility issues associated with the airfield.

4.8.3 Environmental Consequences of the Proposed Project/Action

A noise impact would be considered significant if it substantially increased the ambient noise levels for adjoining areas with sensitive receptors. Noise impact criteria is largely based on land use compatibility guidelines and partly on factors relating to the duration and magnitude of noise level changes. Temporary noise level increase would occur during the construction of the proposed project.

Development of the project would involve site-grading, installation of utilities, construction of the proposed new buildings, and post-construction clean up. These activities typically involve the use of heavy equipment such as excavators, scrapers, graders, compactors, water trucks, tractors, loaders, pavers, and concrete mixers. Trucks would be used to haul waste materials from the site. Smaller equipment, such as jackhammers, pneumatic tools, saws, and hammers, would also be used periodically throughout the site during the construction phase. This equipment would generate both steady state and episodic noise that would be heard both on and off the project site. The amount of equipment and number of construction workers on the site would vary with each phase of construction depending on the intensity of the action.

Table 4.8-1 identifies the range of noise levels that can be generated by various types of construction equipment anticipated to be utilized on the project site.

**TABLE 4.8-1
NOISE LEVELS GENERATED
BY CONSTRUCTION EQUIPMENT**

Construction Equipment	Noise Levels in dB(A) at a Distance of 50 Feet ¹
Air Compressor	75
Backhoe	75
Compactor	80
Concrete Mixer	80
Concrete Pump	75
Dozer	75
Generator	75
Grader	85
Loader	75
Pneumatic Tools	80
Tractor	85
Trucks	75

¹Source: Cowan

As is indicated in Table 4.8-1, noise levels depending on the type of equipment being used on the project site, could generate temporary noise levels as high as 85 dB(A), when measured from a reference distance of 50 feet. However, the actual noise levels associated with the construction of the project would vary widely during the course of construction depending on where the equipment is located and what pieces of equipment are in use at any one time.

Although construction could potentially proceed for more than 8 hours per day, the duration of exposure to elevated noise levels by an observer would likely be less, as the noise sources would be moving along the construction route throughout the day. As a sound source gets further away, the sound level decreases. While construction activities would generate temporary elevated noise levels, based on the duration of construction activities and the implementation of measures suggested below, no adverse impacts would result related to noise generated by construction activities.

The new facilities associated with the proposed project are not considered noise sensitive land uses as the operations are primarily administrative actions associated with base operations. Further, the project site is not located within Level 1, 2, or 3 noise constraints areas associated with the airfield operations. The operations occurring at the new facility would generate new sources of noise typical of administrative and office building operations. Overall, the operation of the proposed project would not cause significant noise impacts.

4.8.4 Environmental Consequences of the No-action Alternative

The No-action Alternative represents the circumstances that would occur if the proposed project/action were not constructed. If the No-action Alternative was selected both the SCF facility site and the electrical substation site would remain vacant and undeveloped. As a result, the No-action Alternative would not generate noise levels that could be considered adverse.

4.8.5 Avoidance, Minimization, and Management Practices

Onsite construction activities shall be limited to between the hours of 7:00 AM and 6:00 PM, and exclude all Sundays and all public holidays.

Construction contractors shall locate stationary noise sources as far from adjacent buildings as possible. If stationary sources must be located near existing receptors, they shall be muffled and enclosed within temporary sheds.

Construction contractors shall implement feasible noise controls to minimize equipment noise impacts on nearby receptors. Feasible noise controls include improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds.

Equipment used for project construction shall be hydraulically- or electrically-powered impact tools (e.g., jack hammers) wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatically-powered tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used. A muffler could lower noise levels from the exhaust by up to about 10 dB(A). External jackets on the tools themselves shall be used where feasible; this could achieve a reduction of 5 dB(A). Quieter procedures shall be used (such as drilling rather than impact equipment) wherever feasible.

4.9 TRAFFIC

The traffic impact analysis first summarizes the potential impacts and programmatic measures as identified in the *Environmental Assessment for the General Plan for the Cantonment Area at Vandenberg AFB* (BTG, 1999), which contains a complete discussion regarding the traffic impacts and avoidance, minimization, and management practices identified for the Cantonment Area. Following this discussion, the analysis addresses specific environmental consequences of the proposed project/action and the No-action Alternative. Potential traffic impacts attributable to the proposed project/action are based on information contained in the Cantonment EA, as well as additional sources of information as applicable. Any additional avoidance, minimization, and management practices that are necessary beyond those identified in the Cantonment EA are also identified in the analysis.

4.9.1 Summary of the Analysis Contained in the Cantonment EA

The Cantonment EA included an analysis of future traffic conditions based on the expected numbers of personnel, workers, and dependent projected population growth. Based on the assumptions used in the analysis, under worst case conditions the projected population increases in the Cantonment Area was expected to result in an increase of 330 trips leaving the base and 415 trips entering the base during the peak hour commutes. Additionally, the analysis noted that miscellaneous trips associated with construction workers, materials delivery, supply vehicles, and visitors could cause slight increases during peak commute times.

The additional trips generated on the base were found to cause minor delays during the peak hours, as well as queuing at a number of locations if all workers and personnel began and ended work at the same time. Overall, the conclusion was made that the increases in traffic associated with projected growth within the Cantonment Area would not result in intersection operations declining below LOS C.

The analysis in the Cantonment EA also addressed the potential impacts at offsite locations, notably California Route 1. While there would be a slight increase in capacity, the increase was found to be so small that there would be no change to the LOS at intersections along California Route 1.

4.9.2 Programmatic Avoidance, Minimization, and Management Practices Identified in the Cantonment EA

No avoidance, minimization, and management practices were identified in the Cantonment EA as no adverse impacts were identified.

4.9.3 Environmental Consequences of the Proposed Project/Action

Project impacts attributable to the proposed project/action on roadways and intersections in the Cantonment Area would be considered significant if they would increase demand in excess of the roadway network capacity to the point that substantial expansion would be necessary. Significant environmental impacts could also result from the system deterioration due to improper maintenance or extension of service beyond its useful life.

Traffic impacts associated with the proposed project/action could potentially occur as a result of construction activities and during the operation of the new facility. Construction activities associated with the proposed project/action would require workers, contractors, and equipment to be moved to and from the construction area on a daily basis. Heavy equipment would be moved to and from the project site once at the beginning of construction activities and then removed at the completion of construction activities. On a daily basis approximately 40 construction workers would travel to and from the project site. The movement of heavy equipment and construction workers to the site on a daily basis would cause a minor impact to existing levels of service on the base. While causing minor disruptions to the existing traffic flow in the area, this impact is not considered to be adverse or significant based on the temporary nature of construction activities. Measures to avoid potential traffic congestion associated with construction activities are identified below.

Operation of the new SCF building would result in approximately 40 workers traveling to and from the facility on a daily basis. These vehicular trips would occur in both peak hour times (typically 6-9 AM and 4-7 PM) and during off-peak hours. Workers would commute from housing areas on the base and to a lesser extent from areas off-base. Minor increases in traffic congestion would occur with the routine commute of workers to and from the SCF building. However, since personnel and workers tend to adjust to travel patterns based on traffic patterns found on the base, the levels of service are expected to remain at or better than LOS C.

4.9.4 Environmental Consequences of the No-action Alternative

The No-action Alternative represents the circumstances that would occur if the proposed project/action were not constructed. If the No-action Alternative was selected both the project site would remain vacant and undeveloped. As a result, the No-action Alternative would not cause any traffic impacts as a result of construction activities. Additionally, no incremental increase in operational traffic would occur as the proposed facility would not be constructed.

4.9.5 Avoidance, Minimization, and Management Practices

The movement of heavy equipment and materials to the construction areas shall occur in off peak hours in order to avoid the AM and PM peak vehicular travel times on weekdays.

SECTION 5.0

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22 nd SOPS	22 Satellite Operations Squadron
ACHP	Advisory Council on Historic Preservation
AFI	Air Force Instruction
AFSPC	Air Force Space Command
AOC	Areas of Concern
AOI	Areas of Interest
BRAC	Base Realignment and Closure
BMPs	Best management practices
ARB	California Air Resource Board
CCAA	California Clean Air Act
DTSC	California Department of Toxic Substance Control
CDMG	California Division of Mines and Geology
CALEPA	California Environmental Protection Agency
AFOSH	California OSHA, Air Force Occupational Safety and Health
CO	Carbon Monoxide
COPCs	Chemicals of potential concern
CAP	Clean Air Plan
CEQ	Council on Environmental Quality
L _{dn}	Day/Night Average Level
dB	Decibel
DSCS	Defense Satellite Control System
ECF	Entry Control Facility
EA	Environmental Assessment
USEPA	Environmental Protection Agency
L _{eq}	Equivalent Noise Level
EOD	Explosive Ordnance Disposal
CAA	Federal Clean Air Act
H ₂ S	Hydrogen Sulfide
IRP	Installation Restoration Program
ICBMs	Intercontinental ballistic missiles

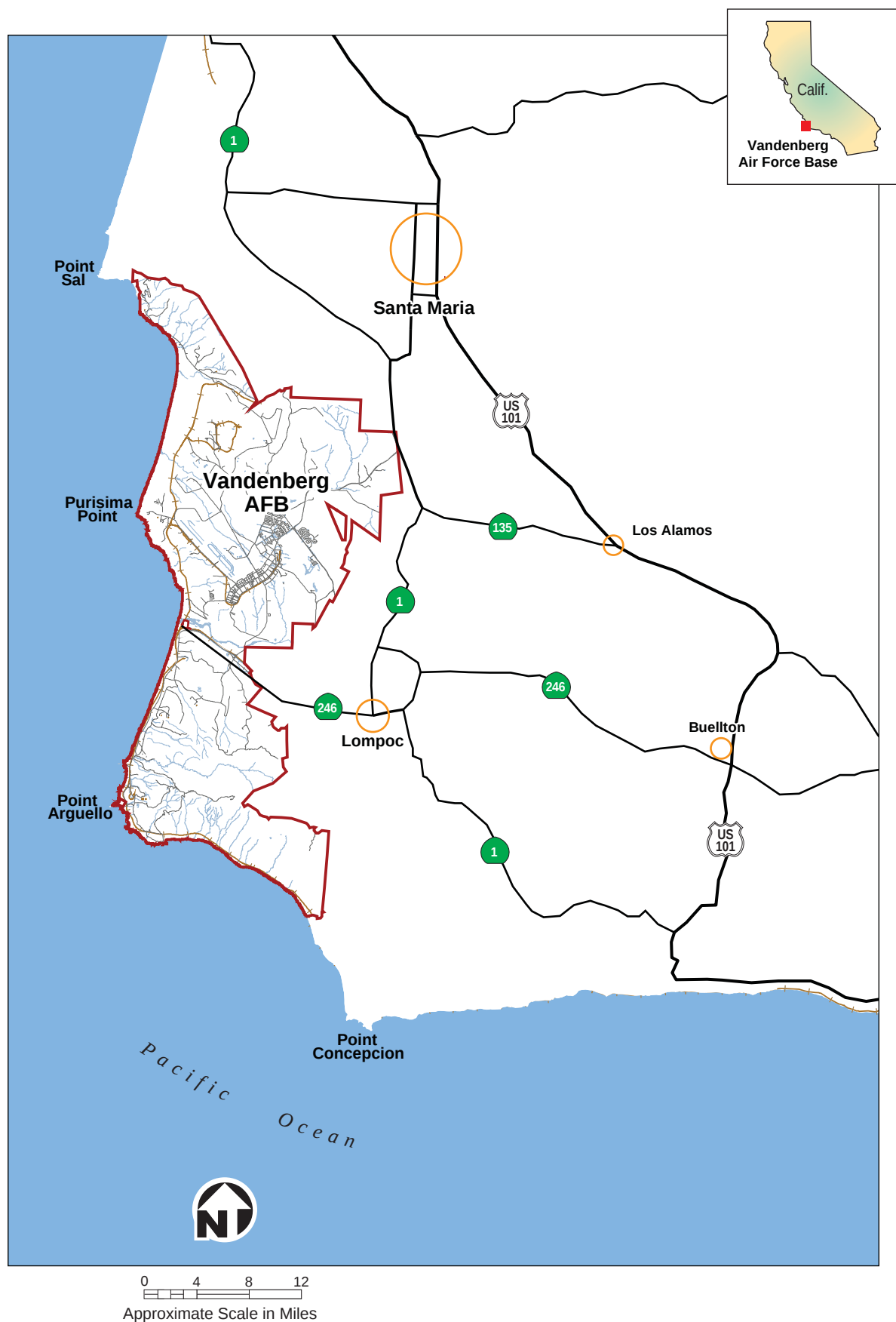
SECTION 8.0**ACRONYMS AND ABBREVIATIONS**

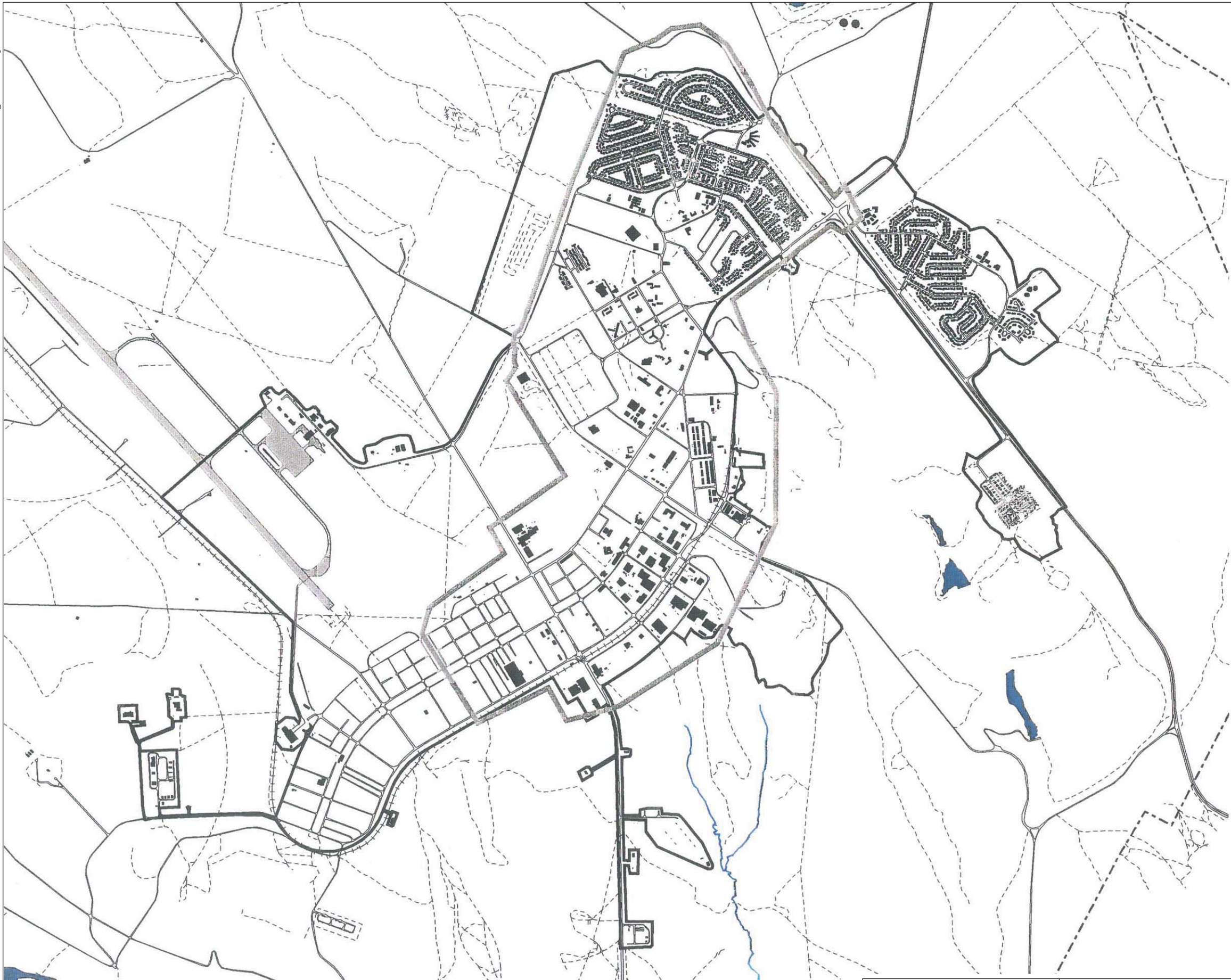
kV	Kilovolt
Pb	Lead
LOS	Level of Service
LUSD	Lompoc Unified School District
MGD	Million gallons per day
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NO _x	Nitrogen Oxides
OSHA	Occupational Safety and Health Act,
O ₃	Ozone
PG&E	Pacific Gas and Electric
ESA	Phase I Environmental Site Assessment
PVC	Polyvinyl chloride
POW	Prisoner of war
ROG	Reactive Organic Gases
RCRA	Resource Conservation and Recovery Act
PM ₁₀	Respirable particulate matter
APCD	Santa Barbara County Air Pollution Control District
SCF	Satellite Control Facility
HEW	Secretary of Health, Education, & Welfare
SWFP	Solid Waste Facility Permit
Basin	South Central Coast Air Basin
sm	Square Meters
SHPO	State Historic Preservation Office
SWPPP	Stormwater Pollution Prevention Plan
SO ₄ ²⁻	Sulfates
SO _x	Sulfur Oxide
TCMs	Transportation control measures

SECTION 8.0

ACRONYMS AND ABBREVIATIONS

UXO	Unexploded ordnance
Air Force	United States Air Force
Corps	United States Army Corps of Engineers
VTs	Vandenberg Tracking Station
WDR	Waste Discharge Requirement





Legend

- Programmatic Environmental Assessment Study Area
- Cantonment Area Boundary
- Property Boundary
- Hydrography
- Unpaved Road/Trail
- Edge of Pavement
- Railroad
- Taxiway/Runway
- Building
- Lake/Pond



SCALE 1" = 2650 feet

MAP PROJECTION: CALIFORNIA STATEPLANE
ZONE: 3376
HORIZONTAL DATUM: NAD83
VERTICAL DATUM: NORTH AMERICAN
VERTICAL DATUM 1988
UNITS: METERS
SPHEROID: WGS 1984

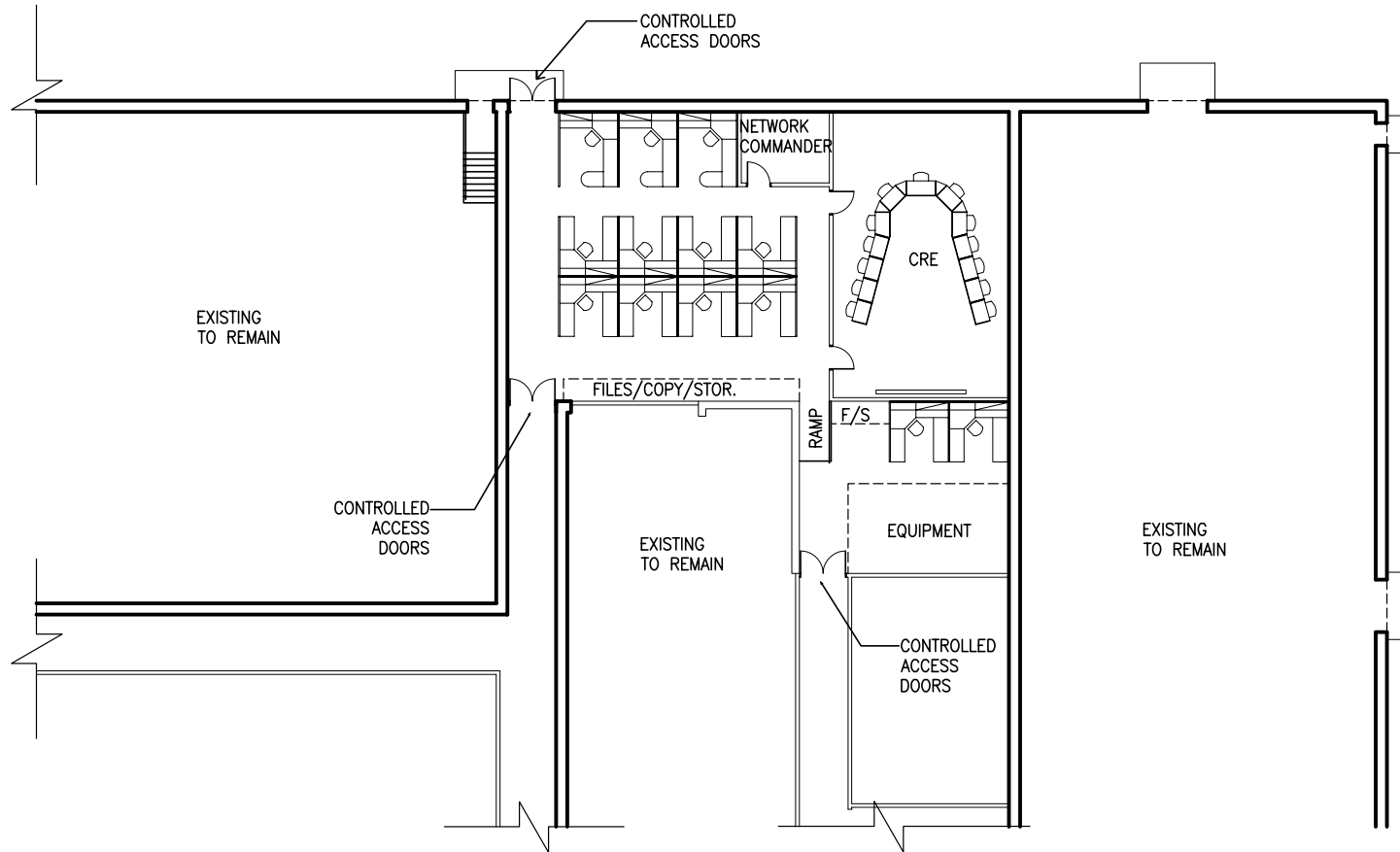
THIS MAP WAS COMPILED BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHY AT A SCALE OF 1:5000. THE INFORMATION SHOWN HEREON IS INTENDED FOR PLANNING PURPOSES ONLY AND IS NOT INTENDED AS A GUIDE FOR DESIGN OR SURVEY WORK.

Satellite Operations Control Facility
Environmental Assessment

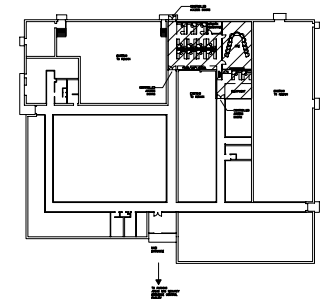
URS Corporation

Source:
Foster Wheeler Environmental
Corporation and BTG Delta
Research Division Dated October 1999

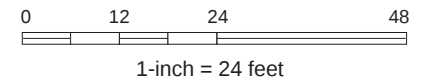
Figure 2-1. CANTONMENT AREA MAP



**22 SOPS Floor Plan
Vandenberg Tracking Station**



Plot Plan



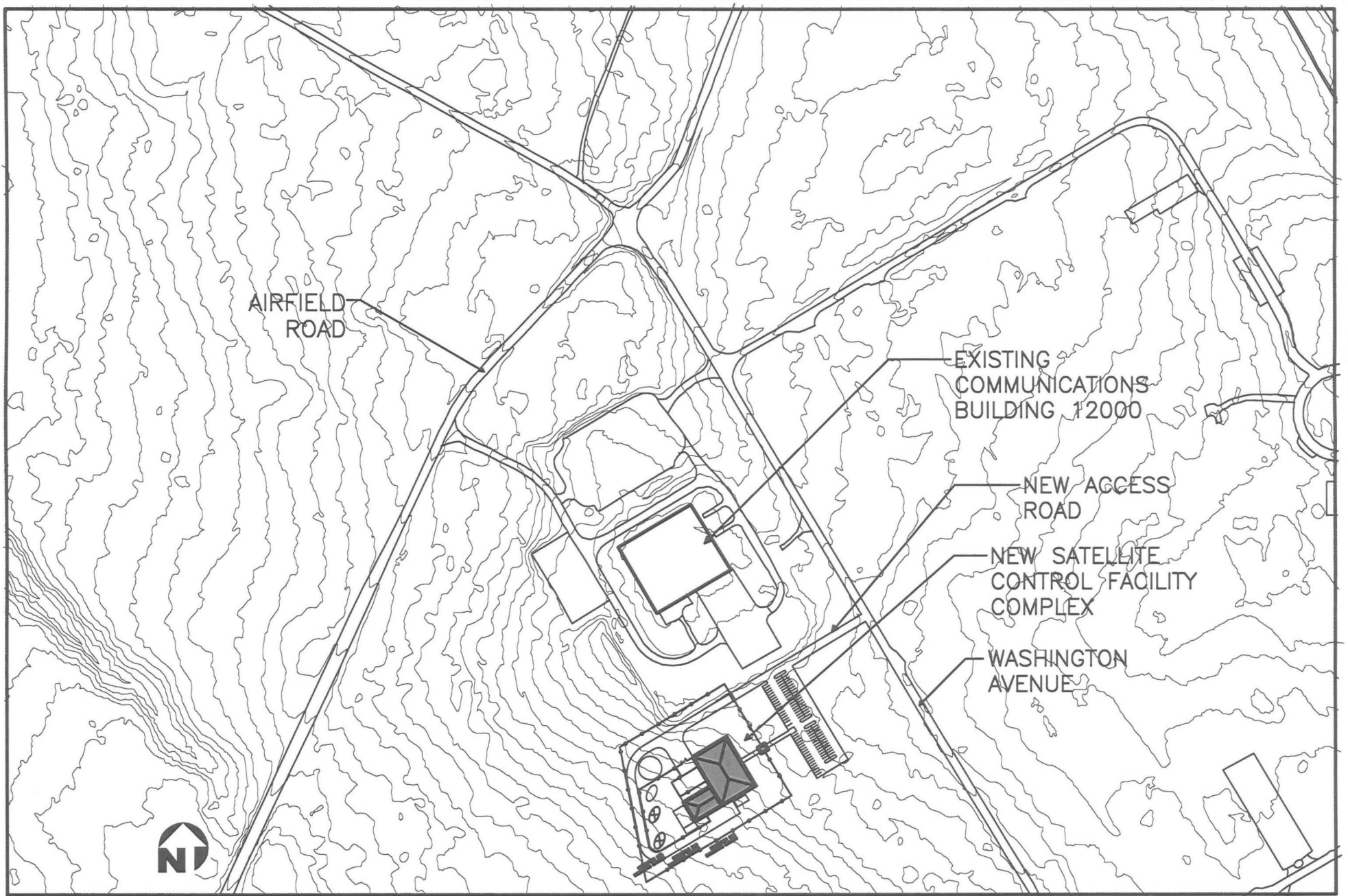
Satellite Operations Control Facility
Environmental Assessment

URS Corporation

Source:
*Satellite Operations Control
Facility Requirements:*
URS 2006

Figure 2-2. VTS SITE PLAN

2007



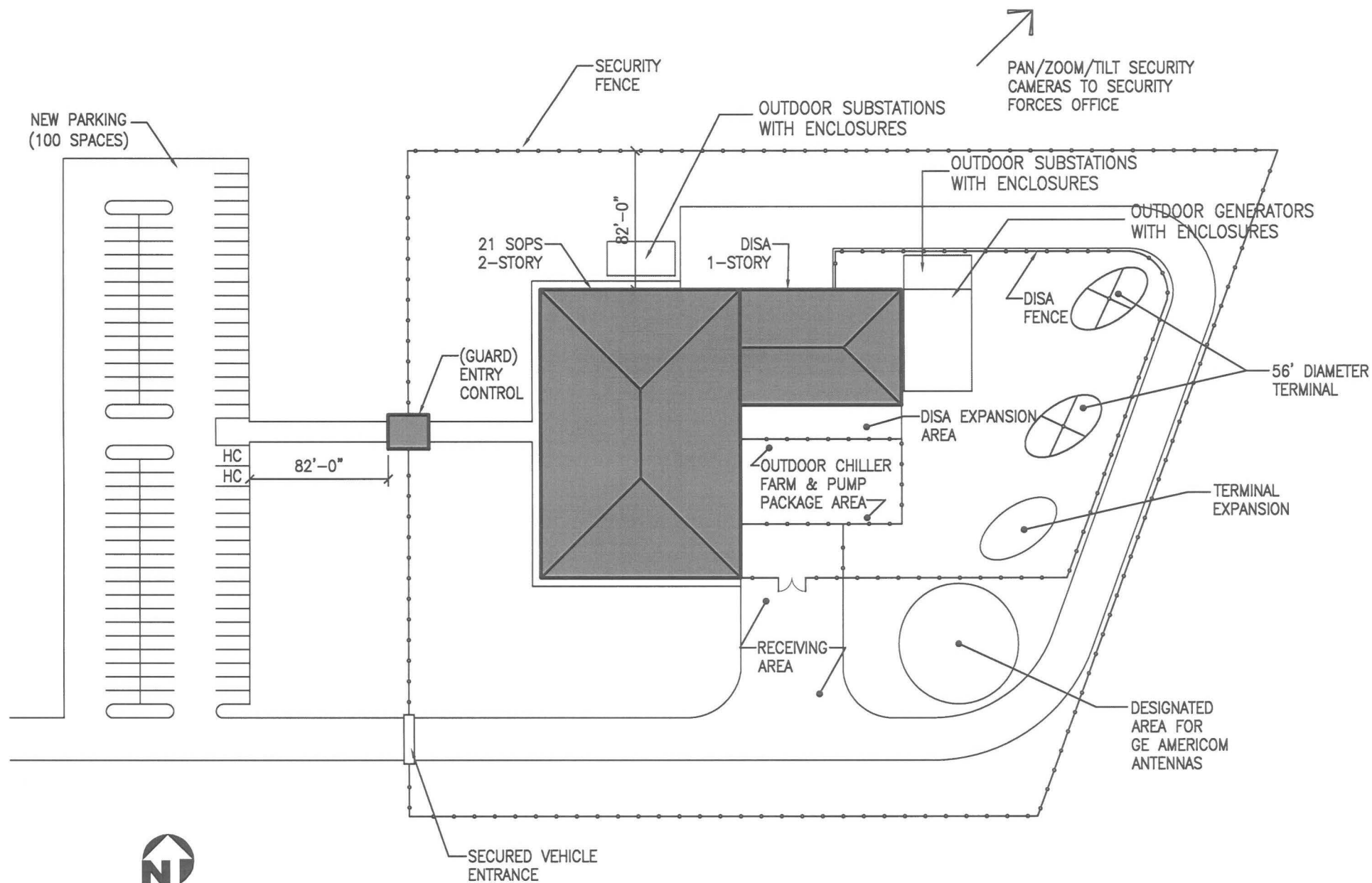
0 200 400 800
1-inch = 400 feet

Satellite Operations Control Facility
Environmental Assessment
URS Corporation

Source:
Satellite Operations Control
Facility Requirements:
URS 2006

Figure 2-3. SCF SITE PLAN

2007



0 40 80 160
1-inch = 80 feet

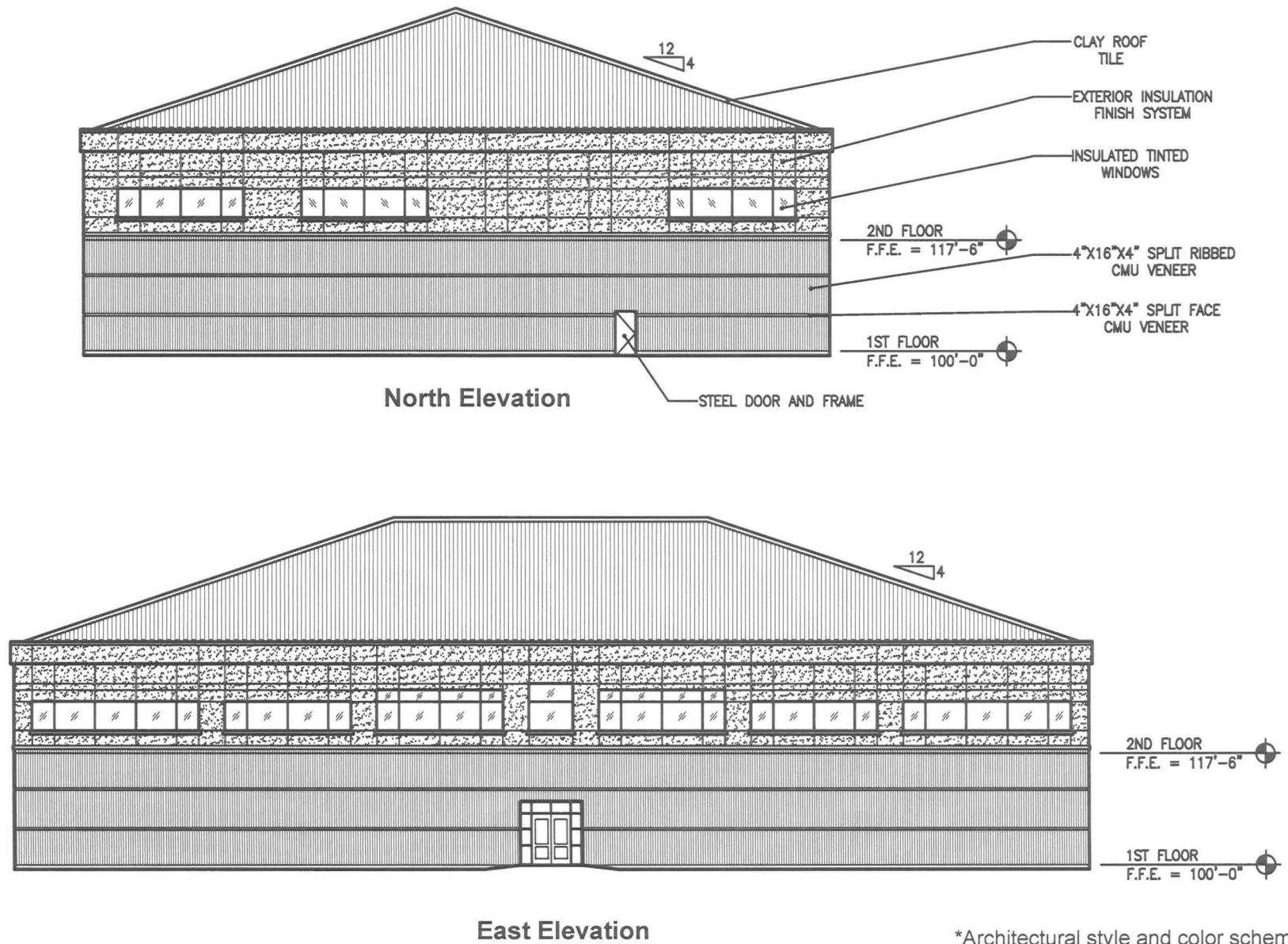
Satellite Operations Control Facility
Environmental Assessment

URS Corporation

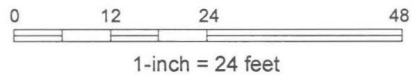
Source:
Satellite Operations Control
Facility Requirements:
URS 2006

Figure 2-4. SCF ENLARGED SITE PLAN

2007



*Architectural style and color scheme to be determined by design Architect-Engineer.



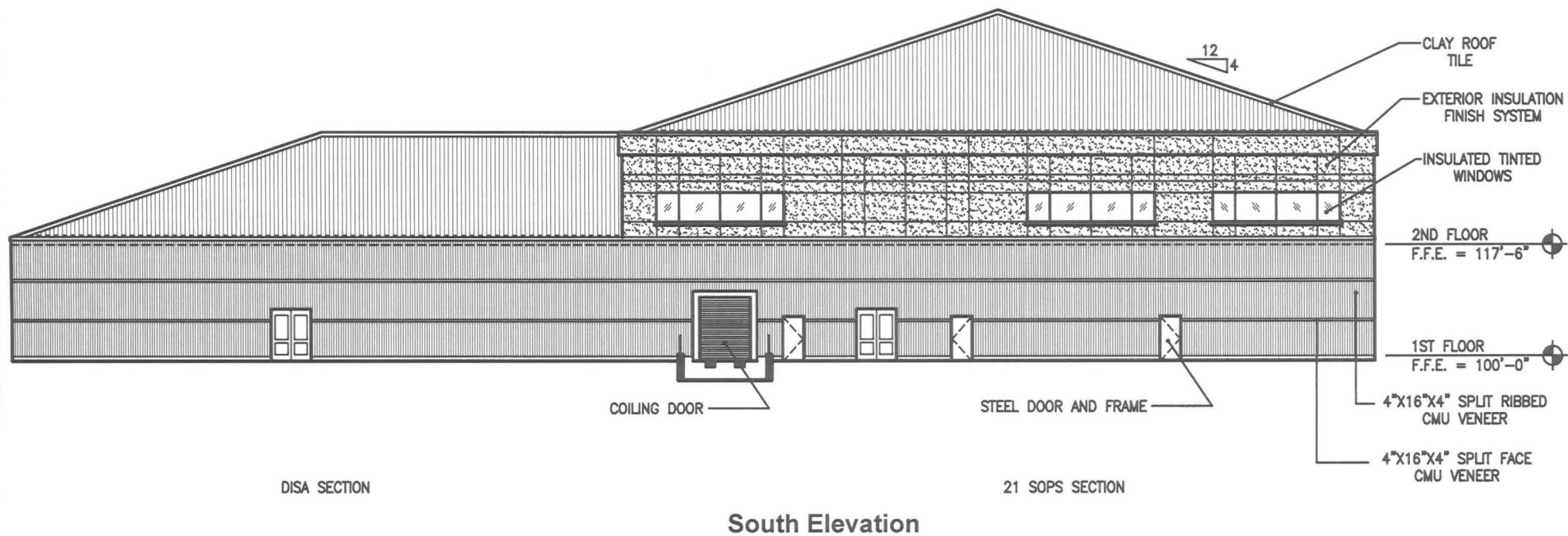
Satellite Operations Control Facility
Environmental Assessment

URS Corporation

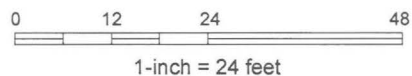
Source:
Satellite Operations Control
Facility Requirements:
URS 2006

Figure 2-5. SCF ELEVATION PLAN

2007



*Architectural style and color scheme to be determined by design Architect-Engineer.



Satellite Operations Control Facility
Environmental Assessment

URS Corporation

Source:
*Satellite Operations Control
Facility Requirements:*
URS 2006

Figure 2-6. **SCF ELEVATION PLAN**

2007

