Draft

Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing Travis Air Force Base, Fairfield, California

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Final Finding of No Significant Impact (FONSI)
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing

Travis Air Force Base, California

Introduction

This Finding of No Significant Impact (FONSI) was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA); the President's Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA, 40 Code of Federal Regulations (CFR) 1500 – 1508; and the *Environmental Impact Analysis Process*, 32 CFR 989. The decision in this FONSI is based on information contained in the *Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing, Travis Air Force Base, California* (EA), which is hereby incorporated by reference. The purpose of the EA was to determine the extent of environmental impacts that might result from the proposed perimeter fence at Travis Air Force Base (Travis AFB) and evaluate whether these impacts, if any, would be significant.

The proposed action is to construct a perimeter security fence and disconnect shared utilities as part of the required action to terminate the former Georgetown Military Family Housing (MFH) lease. The purpose of the Proposed Action is to meet the Base's need to secure the perimeter of Travis AFB before Georgetown MFH is returned to the Property Owner.

Description of Proposed Action and Alternatives

The alternatives that have been analyzed include the No Action Alternative and the Proposed Action. The chosen alternative should construct a perimeter security fence and disconnect shared utilities as part of the action to terminate the former Georgetown MFH lease. The chosen alternative must construct a perimeter security fence that meets Department of Defense Anti-Terrorism/Force Protection (AT/FP) requirements; comply with Air Force and Department of Defense planning and design manuals, design standards, and safety requirements for construction of a perimeter security fence and completion of utility work; secure utilities shared with Georgetown MFH; and use environmentally compliant construction practices.

Under the Proposed Action approximately 2,520 feet of chain-link fence would be demolished, and approximately 4,150 feet of perimeter fence would be constructed. The fence would connect to the existing perimeter fence to the north and east of Georgetown MFH on Travis AFB. The Proposed Action would include disconnection of potable water (water lines) and wastewater (sewer pipes) currently connected to Georgetown MFH. The total construction footprint would be approximately 3 acres.

All alternatives considered for the action are analyzed in the EA. The No Action Alternative was analyzed in accordance with Air Force Regulation 32 CFR 989.8(d).

Decision

After a review of the EA, the U.S. Air Force has decided to proceed with the construction of the Proposed Action. The potential impacts to the human and natural environment were evaluated relative to the existing environment. For each environmental resource or issue, anticipated direct and indirect effects were assessed, considering both short-term and long-term project effects.

With the mitigation measures described below, only minor, short-term impacts would be expected from implementation of the Proposed Action as described in the EA. During construction and operation, the Proposed Action would result in less than significant impacts or

no effects to air quality, noise, hazardous materials, hazardous waste, stored fuels, water resources, cultural resources, land use, airspace/airfield operations, transportation system, environmental management, and environmental justice. During construction, the Proposed Action would provide short-term socioeconomic benefits through the generation of construction jobs. During operation the Proposed Action would provide a beneficial impact to safety and occupational health because the perimeter of Travis AFB would be secured. The United States Fish and Wildlife Service (Service) issued a Biological Opinion (81420-2011-F-0436-1) under the Endangered Species Act on 27 May 2011. The Biological Opinion found that the Proposed Action may affect but is not likely to adversely affect the threatened vernal pool fairy shrimp and endangered vernal pool tadpole shrimp. Permanent and temporary impacts to habitat for the California tiger salamander will occur as a result of construction; however, restoration of the project area back to original conditions and compensation for permanent impacts at an approved mitigation bank will reduce impacts to less than significant levels. Mitigation measures required by the U.S. Fish and Wildlife Service are listed below. Overall, the analysis for this EA indicates that the construction and operation of a perimeter fence and disconnection of utilities shared with Georgetown MFH would not result in or contribute to significant negative cumulative or indirect impacts to the resources in the region.

Mitigation

The Air Force will implement and comply with the Conservation and Minimization Measures listed in the Biological Opinion, including mitigation for permanent impacts to 0.061 acre of upland habitat for the California tiger salamander through the purchase of 0.183 acre of Central California tiger salamander compensation credits at a Service-approved conservation bank in Solano County. The Air Force will implement Best Management Practices (BMPs) to control runoff and sedimentation and regenerate vegetation, establish restricted boundaries for project related activities, and establish a work restriction buffer around the vernal pool located within the Proposed Action area as an avoidance measure.

Based on my review of the facts and analyses contained in the EA, I conclude that implementation of the Proposed Action will not have a significant impact either by itself or when considering cumulative impacts. Accordingly, requirements of the NEPA, regulations promulgated by the Council of Environmental Quality, and 32 CFR 989 are fulfilled and an environmental impact statement is not required."

Public Review and Interagency Coordination

In accordance with Air Force policy, a notice of availability (NOA) for the draft EA and draft FONSI was published on June 6, 2011, in local newspapers. The NOA provided for a 30-day public comment period for documents placed in local libraries and made available to all interested parties on the Travis AFB public Web site. Concurrent interagency and intergovernmental coordination for environmental planning process is performed.

SIGNED:

James C. Vechery DATE: 6 JUL 11

JAMES C. VECHERY, Colonel, USAF
Commander, 60th Air Mobility Wing

Attachment: EA to Construct Perimeter Fence at Georgetown Military Family Housing

Contents

Contents, Continued

Contents, Continued

Contents, Continued

Acronyms and Abbreviations

ºF	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
AFB	Air Force Base
Air Force	U.S. Air Force
AICUZ	Air Installation Compatible Use Zone
AMC	Air Mobility Command
AMW	Air Mobility Wing
AST	aboveground storage tanks
AT/FP	anti-terrorism/force protection
BAAQMD	Bay Area Air Quality Management District
Base	Travis Air Force Base
Basin	San Francisco Bay Area Air Basin
BMP	best management practice
BRPM	Base Remediation Program Manager
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
C&D	construction and demolition
CESA	California Endangered Species Act
CEQ	President's Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CTS	California tiger salamander
CWA	Clean Water Act
dB	decibel

EA	environmental assessment
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FY	fiscal year
GHG	greenhouse gas
MFH	Military Family Housing
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHTSA	National Highway Traffic Safety Administration
NO_x	nitrogen oxides
NRHP	National Register of Historic Places
O_3	ozone
OPR	Office of Planning and Research
P2MAP	*Travis AFB Pollution Prevention Management Action Plan*
$PM_{2.5}$	particulate matter less than 2.5 micrometers in diameter
PM_{10}	particulate matter less than 10 micrometers in diameter
ppm	parts per million
Property Owner	Hunt Building Corporation
RCRA	Resource Conservation and Recovery Act
SIP	state implementation plan
SO_2	sulfur dioxide
SWPPP	stormwater pollution prevention plan
USACE	U.S. Army Corps of Engineers
USC	United States Code
UST	underground storage tanks
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound

SECTION 1

Purpose of and Need for the Proposed Action

1.1 Introduction

The U.S. Air Force (Air Force) Air Mobility Wing (AMW) at Travis Air Force Base (AFB or Base) in Fairfield, California, proposes to construct a perimeter security fence and disconnect shared utilities as part of the required action to terminate the former Georgetown Military Family Housing (MFH) lease. When the lease expires on August 14, 2011, Travis AFB will return possession of the Georgetown MFH area to the Hunt Building Corporation (Property Owner).

Travis AFB entered into the lease agreement with the Property Owner on August 15, 1991, for the development and use of the Georgetown MFH area for 20 years (Hunt Building Corporation, 1991). The future use of the Georgetown MFH area by the Property Owner is unknown.

Georgetown MFH consists of approximately 53 acres and contains 300 housing units, roadway infrastructure, and utility connections. The housing units are unoccupied. Travis AFB does not intend to renew the lease with the Property Owner because sufficient housing is available at other locations onbase.

Travis AFB, with the support of Air Mobility Command (AMC) and the Air Force Center for Engineering and the Environment, has prepared this draft environmental assessment (EA) in accordance with the National Environmental Policy Act (NEPA) implementing Title 40 of the Code of Federal Regulations (CFR), Parts 1500 through 1508; Air Force regulations (32 CFR 989); and Department of Defense directives. This EA evaluates the potential environmental impacts that would result from implementation of the Proposed Action.

1.2 Need for the Action

Implementation of the Proposed Action would meet the Base's need to secure the perimeter of Travis AFB before Georgetown MFH is returned to the Property Owner. The Georgetown MFH area is open to Travis AFB and connected to the Base through shared utility infrastructure (potable water and wastewater). The Proposed Action includes (1) removing 2,520 feet of existing fence that does not meet Department of Defense anti-terrorism/force protection (AT/FP) requirements for perimeter security fence, (2) constructing 4,150 feet of new fence that meets AT/FP requirements for perimeter security fence to separate Travis AFB from Georgetown MFH, and (3) disconnecting shared utilities, as described in Section 2.

1.3 Objectives of the Action

The objectives of the Proposed Action are to construct a perimeter security fence to separate Georgetown MFH from Travis AFB and to disconnect shared utility infrastructure.

1.4 Location of Proposed Action

Travis AFB is located in the city of Fairfield, Solano County, and includes approximately 5,128 acres (see Figure 1-1 [figures appear at the end of the section in which they are first referenced]). The Base is off Interstate 80, approximately midway between Sacramento and San Francisco and 7 miles northeast of central Fairfield.

Georgetown MFH is in the northeast portion of Travis AFB. Open space is to the north and east; the developed areas of Travis AFB are to the south and west (see Figure 1-2).

1.5 Scope of the Environmental Assessment

This EA documents and analyzes the potential environmental and socioeconomic effects associated with the Proposed Action relative to the No Action Alternative.

1.6 Decision(s) That Must Be Made

AMC is responsible for selecting an alternative to secure the installation perimeter and utility connection. A decision to take no action (Alternative 1) would result in Travis AFB not constructing a perimeter fence and not disconnecting utilities shared with Georgetown MFH; no action would result in an unsecured perimeter of approximately 4,150 feet in the northeast section of Travis AFB. A decision to implement the Proposed Action (Alternative 2) would result in Travis AFB securing the perimeter of the Base and disconnecting utilities shared with Georgetown MFH before the lease expires.

1.7 Applicable Regulatory Requirements and Required Coordination

This EA has been prepared in accordance with the President's Council on Environmental Quality (CEQ) regulations (40 CFR 1500 through 1508), as they implement the requirements of NEPA, as amended by 42 United States Code (USC) 4321 et seq., and Air Force regulations (i.e., *Environmental Impact Analysis Process* [32 CFR 989]. Air Force regulations specify the procedural requirements for implementing NEPA and preparing an EA and direct Air Force officials to consider environmental consequences as part of the planning and decision-making process.

Other environmental regulatory requirements relevant to the Proposed Action are identified in this EA. Regulatory requirements under the following programs, among others, are assessed:

- Noise Control Act of 1972
- Clean Air Act (CAA)
- Clean Water Act
- National Historic Preservation Act
- Archaeological Resources Protection Act
- Endangered Species Act of 1973
- Resource Conservation and Recovery Act (RCRA)

- Comprehensive Environmental Response, Compensation, and Liability Act
- Toxic Substances Control Act of 1970
- Occupational Safety and Health Act

Requirements also include compliance with Executive Order (EO) 11988 (*Floodplain Management*), EO 11593 (*Protection and Enhancement of the Cultural Environment*), EO 11990 (*Protection of Wetlands*), EO 12898 (*Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*), EO 13045 (*Protection of Children from Environmental Health Risks and Safety Risks*), and EO 13423 (*Strengthening Federal Environmental, Energy, and Transportation Management*).

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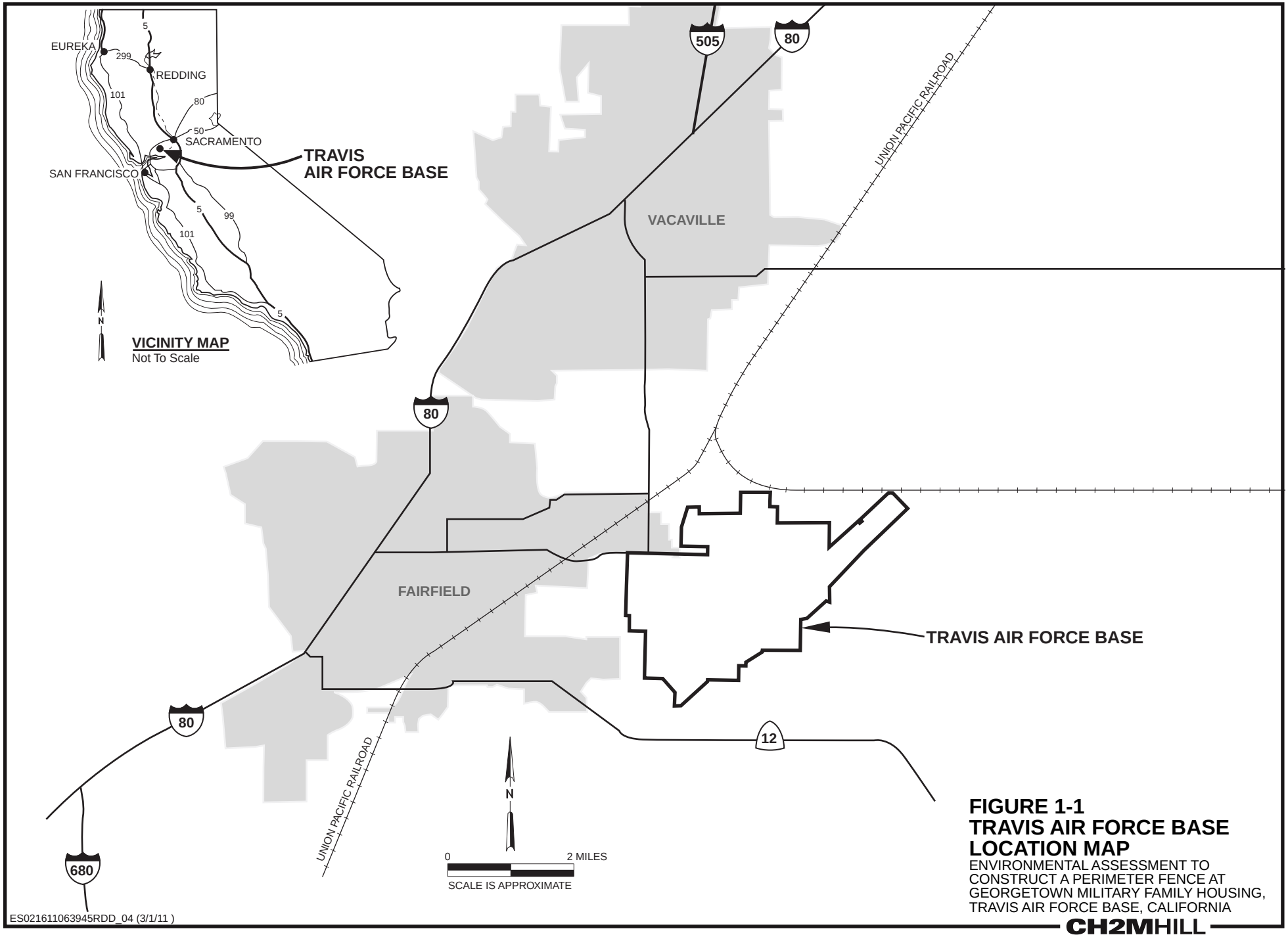

FIGURE 1-1
TRAVIS AIR FORCE BASE
LOCATION MAP
ENVIRONMENTAL ASSESSMENT TO CONSTRUCT A PERIMETER FENCE AT GEORGETOWN MILITARY FAMILY HOUSING, TRAVIS AIR FORCE BASE, CALIFORNIA

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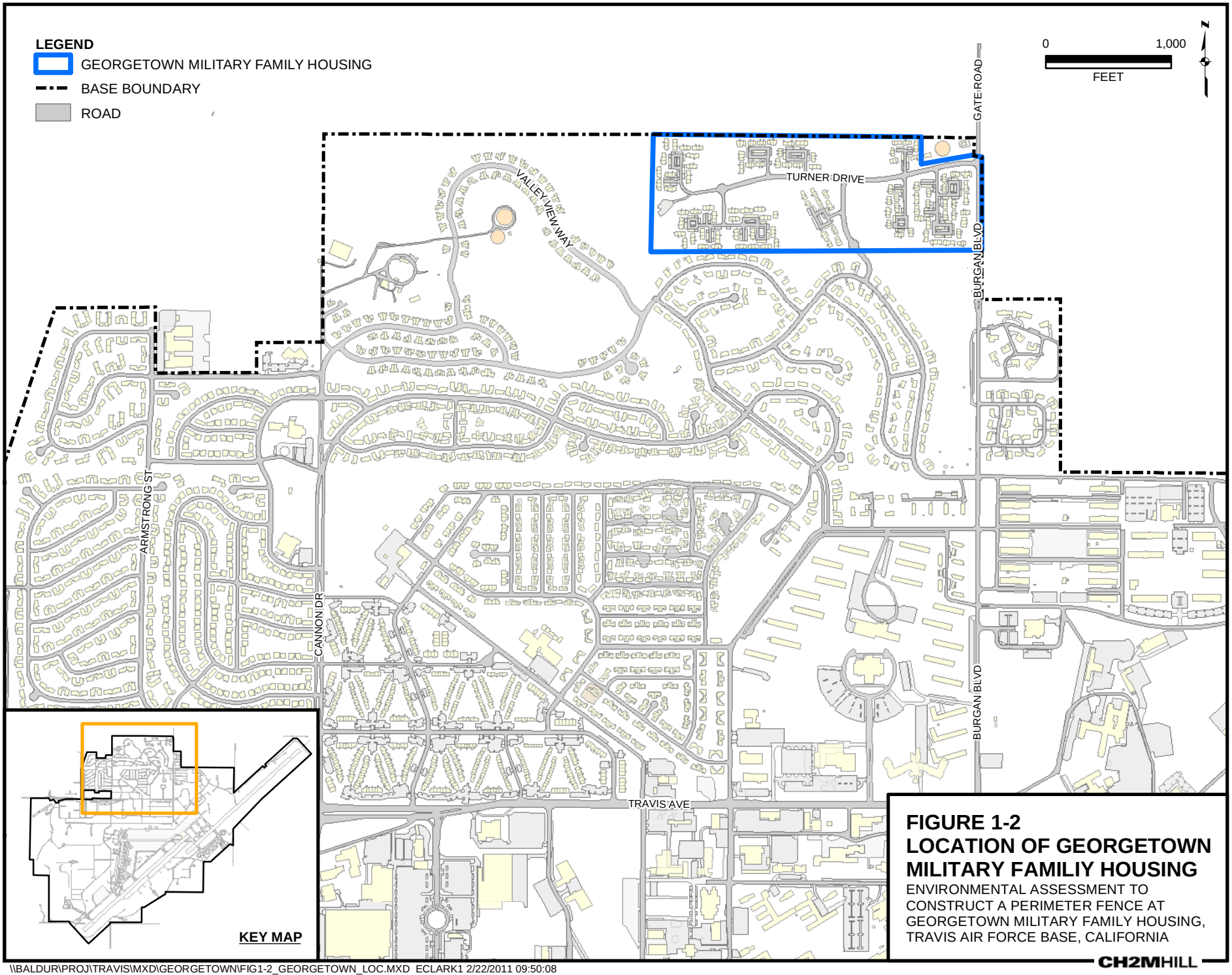

FIGURE 1-2
LOCATION OF GEORGETOWN MILITARY FAMILIY HOUSING
ENVIRONMENTAL ASSESSMENT TO CONSTRUCT A PERIMETER FENCE AT GEORGETOWN MILITARY FAMILY HOUSING, TRAVIS AIR FORCE BASE, CALIFORNIA

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SECTION 2

Description of the Alternatives Including the Proposed Action

2.1 Introduction

This section presents the selection criteria for the alternatives and describes the alternative carried forward for detailed analysis.

2.2 Selection Criteria for Alternatives

Alternatives for constructing a perimeter security fence and disconnection of utilities should meet the following criteria cost-effectively, with minimal impact on human health and the environment:

- Construct a perimeter security fence that meets Department of Defense AT/FP requirements.
- Comply with Air Force and Department of Defense planning and design manuals, design standards, and safety requirements for construction of a perimeter security fence and completion of utility work.
- Secure utilities shared with Georgetown MFH.
- Use environmentally compliant construction practices.

2.3 Description of the Proposed Alternatives

2.3.1 Alternative 1 – No Action

Under the No Action Alternative, a perimeter security fence would not be constructed to separate Travis AFB from Georgetown MFH; this alternative would result in unrestricted access onto Travis AFB through the Georgetown MFH area after the lease expires. Travis AFB and Georgetown MFH would continue to share utilities.

2.3.2 Alternative 2 – Proposed Action

Alternative 2 is the Proposed Action. The Air Force and AMC propose to construct a perimeter security fence and disconnect shared utilities as part of the action to terminate the former Georgetown MFH lease.

A perimeter fence would be constructed along the south and west sides of Georgetown MFH, and along the south and west sides of the northeast water tower yard (see Figure 2-1). The northeast water tower yard is owned by Travis AFB; therefore, following termination of the lease, the northeast water tower yard requires separate fencing to remain secure.

Figure 2-1 shows the proposed action footprint. Under Alternative 2, the following activities would be performed:

- Demolish the chain-link fence and foundations on the west and south sides of Georgetown MFH and the west and south sides of the northeast water tower.
- Construct perimeter fence on the west and south sides of Georgetown MFH and the west and south sides of the northeast water tower.
- Fill two sanitary sewer manholes with concrete.
- Excavate, cut, and cap a potable water line.

The total construction footprint would be approximately 3 acres, including unpaved areas that would be used as a buffer area during construction. Staging of equipment, supplies, and vehicles would occur on paved roads in Georgetown MFH and other paved surfaces near the Proposed Action.

The discussion of construction and operation of the Proposed Action in the following sections is based on information from Travis AFB and Air Force Form 813 (see Appendix A).

2.3.2.1 Demolition of Existing Fence

Approximately 1,880 feet of chain-link fence on the west and south sides of Georgetown MFH and approximately 640 feet of chain-link fence on the west and south sides of the northeast water tower would be demolished (see Figure 2-1). A 30-foot-wide buffer area (15 feet on either side of the chain-link fence) would be established to accommodate personnel, vehicles, and equipment supporting demolition activities. The chain-link fence could be demolished concurrently with construction of the perimeter fence.

2.3.2.2 Construction of Perimeter Fence

Approximately 4,150 feet of perimeter fence would be constructed under the Proposed Action. The fence would connect to the existing perimeter fence to the north and east of Georgetown MFH on Travis AFB (see Figure 2-1).

The perimeter fence would follow the specifications listed below:

- The fence would have an approximate 5-foot setback from the Georgetown MFH property boundary.
- The fence would consist of 9-gauge 2-inch mesh, would be 6 feet high, and would have outriggers supporting three strands of barbed wire, for a total height of 7 feet.
- Fence posts would be steel and would be installed at a minimum depth of 4 feet for the pull posts and a minimum depth of 3 feet for the line posts.
- Fence posts would be spaced 10 feet apart.
- Concrete footings for the fence posts would follow Specification No. 12068015, Section 03300, Cast-in-Place Concrete (Travis AFB, 2002a).

- A steel grill would be installed over the 24-inch corrugated metal culvert at the Union Creek crossing on the south fence line of Georgetown MFH.
- Trees would be removed within 10 feet of the perimeter fence.

Construction of the perimeter fence would require accessing unpaved areas of the Base and Georgetown MFH. The majority of the proposed perimeter fence line is unpaved, with the exception of Kuter Drive and Burgan Boulevard. A buffer area would be established on either side of the perimeter fence to accommodate construction activities. The buffer area would be approximately 30 feet wide (15 feet on either side of the perimeter fence) to accommodate construction personnel, vehicles, equipment, and supplies.

The perimeter fence would cross Union Creek on the south side of Georgetown MFH. At the creek location, the new fence would be installed on top of an existing service road crossing and culvert, and a culvert grill would be installed on the 24-inch metal culvert at the creek crossing (see Figure 2-2).

2.3.2.3 Separation of Shared Utilities

Shared utilities include potable water (water lines) and wastewater (sewer pipes) (see Figure 2-2). A 20-foot-wide buffer area would be established around each of the shared utility locations where disconnection would occur to accommodate personnel, vehicles, and equipment.

Disconnecting potable water and wastewater utility infrastructure would include the following activities:

- ***Potable Water*** – Potable water enters Georgetown MFH from Travis AFB via an underground water line. The water line extends from a water tower to the west of Georgetown MFH. The water line would be separated by excavating, cutting, and capping the water line at the water line isolation valve (see Figure 2-2). The water line isolation valve is inside a fenced water tower yard on Travis AFB. Access to the water tower yard is from Valley View Way.
- ***Wastewater*** – Two underground sewer pipes transport wastewater from Georgetown MFH into Travis AFB. The sewer pipes are accessed on Travis AFB by manholes directly to the south of the proposed perimeter fence line (see Figure 2-2). Both manholes would be filled with concrete, thus separating the shared sewer pipes from Travis AFB. The manhole farthest to the east would be accessed via the gravel jogging path (approximately 10 feet from the manhole). The manhole to the west is on Kuter Drive.

There are no shared electrical cables, fuel pipelines, or stormwater system infrastructure between Travis AFB and Georgetown MFH. Travis AFB would contact Pacific Gas & Electric Company to turn off electrical power to Georgetown MFH before the lease expires. No further action is required regarding electrical cables, fuel pipelines, or the stormwater system under the Proposed Action.

2.3.2.4 Schedule, Personnel, and Equipment

Construction of the perimeter fence at Georgetown MFH would take approximately 45 working days, from approximately July 1, 2011, through August 14, 2011.

Approximately 15 personnel, working 8 hours per day, would be needed during construction. Personnel and equipment would work within designated construction limits. Staging of equipment used during construction would occur on existing paved surfaces. Construction vehicles would stay within buffer areas for access to unpaved areas.

Construction equipment would include the following:

- Cement truck (1)
- Backhoe loader (tractor or loader) (1)
- Water truck (1)
- Post hole auger (hand-held with drill) (1)
- Vehicles for worker transport (8)
- Equipment transport trucks (4)

2.4 Alternatives Considered but Eliminated from Analysis

This EA analyzes No Action (Alternative 1) and the Proposed Action (Alternative 2). No other alternatives are considered in this EA because when the lease expires, Travis AFB will return possession and use of Georgetown MFH to the Property Owner. The Proposed Action, which includes construction of a perimeter fence and separation of shared utilities from the Georgetown HMF area, is the only feasible alternative to the No Action Alternative.

2.5 Description of Past and Reasonably Foreseeable Future Actions Relevant to Cumulative Impacts

This EA identifies actions that have been conducted in the past, actions that are ongoing or in the planning stages, and future actions related to the Proposed Action. Actions that could cause cumulative impacts are included in Section 4.

2.6 Identification of Preferred Alternative

The Air Force's preferred alternative for this EA is the Proposed Action described in Section 2.3.2. The Proposed Action is the only alternative that meets the selection criteria.

2.7 Comparison of the Environmental Impacts of Alternatives

Table 2-1 presents the potential environmental consequences of implementing Alternatives 1 and 2.

TABLE 2-1
Summary of Potential Environmental and Socioeconomic Consequences
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing
Travis Air Force Base, California

	Environmental and Socioeconomic Consequences[a]	
Resource	**Alternative 1 No Action**	**Alternative 2 Proposed Action**
Air Quality	No impact	Less than significant
Noise	No impact	Less than significant
Hazardous Materials, Wastes, ERP Sites, and Stored Fuels		
Hazardous Materials	No impact	Less than significant
Wastes	No impact	Less than significant
ERP Sites	No impact	No Impact
Stored Fuels	No impact	No Impact
Water		
Water Quality	No impact	Less than significant
Wastewater	No impact	Less than significant
Flooding	No impact	Less than significant
Biological		
Vegetation and Wildlife	No impact	Less than significant
Federal- and State-listed Threatened or Endangered Species	No impact	Less than significant
Wetlands	No impact	Less than significant
Socioeconomic	No impact	Slight beneficial impact (construction) Less than significant (operation)
Cultural	No impact	Less than significant
Land Use	No impact	No impact
Transportation System	No impact	Less than significant
Airspace/Airfield Operations	No impact	No Impact
Safety and Occupational Health	No impact	Less than significant (construction) Beneficial impact (operation)
Environmental Management		
Geology and Soils	No impact	Less than significant
Pollution Prevention	No impact	Less than significant
Environmental Justice	No impact	Less than significant
Indirect and Cumulative Impacts	No impact	Less than significant

[a]Under Alternative 1, construction would not take place and, therefore, there would be no effects from construction. Effects of Alternative 2 are compared to the No Action Alternative.

Note:

ERP = Environmental Restoration Program

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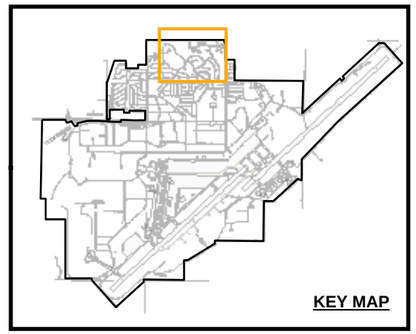
NORTHEAST WATER TOWER

Water Line Isolation Valve

Sanitary Sewer Manhole



LEGEND

- PROPOSED ACTION FOOTPRINT
- EXISTING FENCE PROPOSED FOR DEMOLITION
- PROPOSED PERIMETER FENCE
- BASE BOUNDARY
- EXISTING FENCE
- WATER TOWER
- BUILDING
- DRIVEWAY
- ROAD
- PARKING

0 350 FEET

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FIGURE 2-1
PROPOSED ACTION FOOTPRINT

ENVIRONMENTAL ASSESSMENT TO CONSTRUCT A PERIMETER FENCE AT GEORGETOWN MILITARY FAMILY HOUSING, TRAVIS AIR FORCE BASE, CALIFORNIA

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NORTHEAST WATER TOWER

UNION CREEK

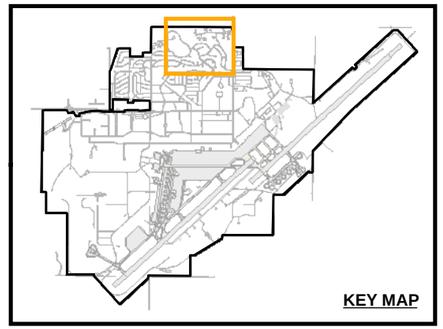
Water Line Isolation Valve

VERNAL POOL

CREEK CROSSING

Sanitary Sewer Manhole

DUCK POND



LEGEND

- PROPOSED ACTION FOOTPRINT
- EXISTING FENCE PROPOSED FOR DEMOLITION
- PROPOSED FENCE
- BASE BOUNDARY
- EXISTING FENCE
- SEWER INLET
- STORM MANHOLE
- ELECTRICAL CABLE LINE
- SEWER PIPE
- STORM PIPE
- WATER LINE
- WETLAND
- SURFACE WATER
- WATER TOWER
- BUILDING
- PARKING
- ROAD
- DRIVEWAY

0 350 Feet

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FIGURE 2-2
INFRASTRUCTURE
ENVIRONMENTAL ASSESSMENT TO CONSTRUCT A PERIMETER FENCE AT GEORGETOWN MILITARY FAMILY HOUSING, TRAVIS AIR FORCE BASE, CALIFORNIA

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SECTION 3

Affected Environment

3.1 Introduction

This section describes the environment at Travis AFB that could be affected as a result of implementing the Proposed Action (see Section 2). The potential impacts of the Proposed Action are described in Section 4.

3.2 Air Quality

Travis AFB is located in central Solano County, which is at the eastern edge of the San Francisco Bay Area Air Basin (Basin). The Basin extends from Napa County in the north to Santa Clara County in the south. The Basin encompasses 5,340 square miles and 19 percent of California's population. The Basin is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD) pursuant to a mandate from the California Air Resources Board (CARB). Only the golf course at Travis AFB extends into a neighboring jurisdiction, the Yolo-Solano Air Quality Management District.

This section discusses existing meteorological and topographical conditions, applicable federal and state regulations, regional air quality management programs, and the current air quality conditions.

3.2.1 Regional Climate

California has a Mediterranean climate, with wet winters and dry summers. Although Travis AFB is not near the coast, it is near the Carquinez Strait, a major break in the Coast Range that allows the ocean to moderate temperatures at Travis AFB. The Base usually experiences mild temperatures; the mean annual temperature is 60 degrees Fahrenheit (°F). The lowest temperatures are in January, with a mean of 46°F. The highest temperatures are in July and August, with a mean of 72°F. The monthly mean relative humidity typically ranges from 50 percent in June to 77 percent in January. The mean annual relative humidity is 60.5 percent. Precipitation is approximately 17 inches per year.

During late summer and early fall, Travis AFB is subject to marine air flowing from high pressure cells offshore toward low pressure in the Central Valley. Winds tend to flow from the west at 15 to 20 miles per hour and are typically strongest in the afternoon. The Base occasionally experiences easterly winds generated in the Central Valley. Winds from the Central Valley tend to have higher pollutant loads.

3.2.2 Current Air Quality Conditions

3.2.2.1 Regional Condition at San Francesco Bay Area Air Basin

The Basin has been assessed for compliance with California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). Three air quality designations can be given to an area for a particular pollutant:

- **Nonattainment:** Applies when air quality standards have not been consistently achieved.
- **Attainment:** Applies when air quality standards have been achieved.
- **Unclassified:** Applies when there is not enough monitoring data to determine whether the area is in nonattainment or attainment.

Relevant ambient air quality standards and their attainment status are listed in Table 3-1. For state standards, the Basin is designated as nonattainment for ozone, particulate matter less than 10 micrometers in diameter (PM_{10}) (i.e., fugitive dust), and particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$) (CARB, 2011). For federal standards, the Basin is designated as nonattainment for 8-hour ozone and $PM_{2.5}$ and as maintenance for carbon monoxide. All other criteria pollutants are designated attainment or are unclassified.

TABLE 3-1
Bay Area Air Quality Management District Attainment Status as of March 2011
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing
Travis Air Force Base, California

		CAAQS		NAAQS	
Pollutant	**Averaging Time**	**Standard**	**State Attainment Status**	**Standard**	**Federal Attainment Status**
O_3	8 hour 1 hour	0.07 ppm 0.09 ppm	Nonattainment	0.075 ppm NA	Nonattainment (marginal)
CO	8 hour 1 hour	9.0 ppm 20.0 ppm	Attainment	9.0 ppm 35.0 ppm	Attainment/maintenance
NO_2	Annual 1 hour	0.03 ppm 0.18 ppm	Attainment	0.053 ppm 0.100 ppm	Attainment/unclassified
SO_2	Annual 24 hour 3 hour 1 hour	NA 0.04 ppm 0.25 ppm	Attainment	0.03 ppm 0.14 ppm NA	Attainment/unclassified
PM_{10}	Annual 24 hour	20 $\mu g/m^3$ 50 $\mu g/m^3$	Nonattainment	NA 150 $\mu g/m^3$	Attainment/unclassified
$PM_{2.5}$	Annual 24 hour	12 $\mu g/m^3$ NA	Nonattainment	15 $\mu g/m^3$ 35 $\mu g/m^3$	Nonattainment

Notes:

$\mu g/m^3$ = micrograms per cubic meter
CO = carbon monoxide
NA = not applicable
NO_2 = nitrogen dioxide
O_3 = ozone
ppm = parts per million
SO_2 = sulfur dioxide

Sources: CARB, 2011; EPA, 2011

Table 3-2 lists the number of days when nonattainment and maintenance pollutants (ozone, carbon monoxide, PM_{10}, and $PM_{2.5}$) exceeded NAAQS or CAAQS in BAAQMD from 2000 to 2009. As shown, there are no exceedances of carbon monoxide concentrations for the 1-hour and 8-hour state and federal standards.

TABLE 3-2
Number of Days of San Francisco Bay Area Air Basin Exceedances of the California and National Ambient Air Quality Standards, 2000 through 2009
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing
Travis Air Force Base, California

	Standard Exceeded	Period	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
O_3	CAAQS	1-hour	12	15	16	19	7	9	18	4	9	11
	NAAQS	8-hour	4	7	7	7	0	1	12	1	12	8
	CAAQS	8-hour	N/A	N/A	N/A	N/A	N/A	9	22	9	20	13
CO	NAAQS	1-hour	0	0	0	0	0	0	0	0	0	0
	CAAQS	1-hour	0	0	0	0	0	0	0	0	0	0
	NAAQS	8-hour	0	0	0	0	0	0	0	0	0	0
	CAAQS	8-hour	0	0	0	0	0	0	0	0	0	0
PM_{10}	NAAQS	24-hour	0	0	0	0	0	0	0	0	0	0
	CAAQS	24-hour	7	10	6	6	7	6	15	4	5	1
$PM_{2.5}$	NAAQS	24-hour	1	5	7	0	1	0	10	14	12	11

Note:
N/A = no data available

Source: BAAQMD, 2010a.

Ozone concentrations exceeded the NAAQS (8-hour) in 9 of the 10 years. CAAQS (1-hour and 8-hour) was exceeded every year since 2005 when monitoring data were available. Exceedances are generally attributed to particular meteorological patterns combined with increases in emissions during the summer. Urban vehicular emissions, industrial emissions, and high ambient temperatures in the Basin contribute to summer ozone generation and subsequent air standard violations.

3.2.2.2 Local Condition Near Travis AFB

Table 3-3 provides the summary of air monitoring data near Travis AFB. The closest ozone monitoring station is approximately 5 miles north of Travis AFB, at 2012 Ulatis Drive in Vacaville, Solano County. The Vacaville-Ulatis station is located outside of the San Francisco Bay Area Air Basin, and is managed by the neighboring Yolo-Solano Air Quality Management District. Vacaville-Ulatis station started monitoring ozone concentrations in 2003. The 8-hour ozone concentrations range from 0.078 to 0.093 ppm, exceeding the CAAQS and NAAQS in all 7 years since the monitoring started at this station.

The closest PM_{10} monitoring station is at 650 Merchant Street in Vacaville, under jurisdiction of the Yolo-Salano Air Quality Management District. The 24-hour PM_{10} concentrations ranged from 35 to 82 $\mu g/m^3$, exceeded the CAAQS in 4 of the 10 years since 2000. The 24-hour PM_{10} NAAQS was not exceeded in the past 10 years.

$PM_{2.5}$ concentrations are monitored at 304 Tuolumne Street in Vallejo. The 98th percentile $PM_{2.5}$ concentration exceeded the NAAQS in 7 of 10 years during 2000 through 2009.

TABLE 3-3
Local Monitoring Data Near Travis AFB, 2000 through 2009
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing
Travis Air Force Base, California

	Period	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
O_3	1-hour	ppm	N/A	N/A	N/A	0.094	0.101	0.101	0.108	0.103	0.112	0.106
	8-hour	ppm	N/A	N/A	N/A	0.081	0.087	0.080	0.087	0.078	0.093	0.085
PM_{10}	24-hour	$\mu g/m^3$	50.0	82.0	66.0	42.0	44.0	35.0	60.0	42.3	60.7	27.4
	Annual	$\mu g/m^3$	18.9	20.7	19.8	15.9	18.6	16.4	18.1	14.6	16.5	13.6
$PM_{2.5}$	24-hour (98th percentile)	$\mu g/m^3$	44.0	56.0	55.5	25.1	36.9	35.5	34.3	38.6	36.3	33.5
	Annual	$\mu g/m^3$	11.6	12.5	14.0	9.4	12.7	9.6	12.4	12.0	9.8	9.7

Note:
N/A = no data available

Source: http://www.arb.ca.gov/adam/, accessed March 2011.

3.3 Noise

The Air Force uses the Air Installation Compatible Use Zone (AICUZ) guidelines to promote compatible land use development. Noise is one consideration addressed by AICUZ, and the Community Noise Equivalent Level (CNEL) is one noise level descriptor used. The CNEL is the average sound energy level for a 24-hour period determined after the addition of a 5-decibel (dB) penalty to noise events between 7:00 a.m. and 10:00 p.m. and a 10-dB penalty to noise events between 10:00 p.m. and 7:00 a.m. The CNEL is calculated by using the sound energy generated by individual noise events, the number of events during a 24-hour period, and the time of the events.

Operations throughout the Base experience noise levels that range from 60 to more than 75 dB.

3.4 Hazardous Materials, Waste, Environmental Restoration Program Sites, and Stored Fuels

This section describes the hazardous materials and hazardous waste, solid waste, ERP sites, and stored fuels at Travis AFB.

3.4.1 Hazardous Materials and Hazardous Waste

Activities that use most of the hazardous materials include maintenance of aircraft, transportation, equipment, and facilities. For example, these activities use flammable solvents, fuels, lubricants, stripping chemicals, oils, and paint (Travis AFB, 2006). Hazardous materials are ordered, stored, and used in accordance with AFI 32-7086 (AMC, 2006).

Activities at Travis AFB generate more than 1,000 kilograms of hazardous waste per month, qualifying the Base as a large-quantity generator under RCRA. Travis AFB operates in accordance with U.S. Environmental Protection Agency (EPA) and California regulations

pertaining to large-quantity generators; Travis AFB is subject to state regulations that implement RCRA requirements in California (Travis AFB, 2006).

Travis AFB maintains and implements the *Travis Air Force Base Hazardous Waste Management Plan* (Travis AFB, 2004a) to comply with RCRA, state, and Air Force regulations. The plan establishes the procedures, training requirements, inspections, and record management procedures for hazardous waste.

3.4.2 Solid Waste

Nonhazardous waste generated at Travis AFB during fiscal year 2003 totaled 32.7 tons per day (11,927 tons per year), including recycled waste and waste sent to a disposal facility. The amount of diverted waste (e.g., composting, mulching, recycled, and reused) averaged 13.48 tons per day (4,921 tons per year). The amount of nonhazardous waste sent to a disposal facility averaged 19.19 tons per day (7,006 tons per year) (Travis AFB, 2006).

Travis AFB recycles an average of 1.8 tons per month of aluminum, glass, and plastic at the onbase recycling center and one-half ton per month at the offbase facility outside the main gate.

Construction and demolition (C&D) debris disposal is cyclic by nature; however, much of C&D debris is recycled, reused, or otherwise diverted from landfills. By weight, concrete composes the largest percentage of the C&D debris generated by most projects. In fiscal year 2003, 46,545 tons of C&D debris (e.g., concrete, wood, and metal) was recycled (Travis AFB, 2006).

Nonhazardous solid wastes and refuse, excluding metal, at Travis AFB are collected and disposed of by Solano County Garbage Company at Potrero Hill Landfill. The onbase Defense Reutilization Marketing Office recycles metal. The Asset Management Flight Recycling Program Manager administers a basewide recycling program that includes education, briefings, computer-based training, and teaching tools available to all squadrons. Solid waste is disposed of in accordance with the *Integrated Solid Waste Management Plan* (Travis AFB, 2004b).

3.4.3 Operable Units and Environmental Restoration Program Sites

An operable unit contains sites with soil or groundwater contamination. The West/Annexes/Basewide Operable Unit and the North/East/West Industrial Operable Unit contain approximately 32 ERP sites (URS Corporation, 2006).

The 60 CES/CEA Restoration Section implements the ERP to remediate threats to human health and welfare or the environment. ERP sites include landfills, spill areas, waste disposal sites, drum storage areas, underground storage tanks (UST) and piping, oil/water separators, waste treatment plants, and former small arms range. Some groundwater ERP sites have had extraction/remediation systems installed to facilitate site cleanup (Travis AFB, 2003a).

3.4.4 Stored Fuels

Gasoline and diesel fuel used for military vehicles and ground equipment are stored onbase in aboveground storage tanks (AST) and USTs. Thirty USTs are in use and regulated by the California UST program. Activities for removal or replacement of 20 USTs are conducted

under the Solano County and State of California UST programs. There are also 38 deferred/ exempt USTs at the Base (Travis AFB, 2006).

3.5 Water Resources, Floodplains, and Wastewater

This section describes the groundwater and surface water resources, floodplains, stormwater, and wastewater at Travis AFB.

3.5.1 Groundwater

Travis AFB is not underlain by extensive water-bearing materials. Groundwater is present at the Base in shallow deposits and generally follows the surface topography south to the Suisun Marsh, Suisun Bay, and ultimately into San Francisco Bay (Travis AFB, 2003a).

3.5.2 Surface Water

Travis AFB is in the northeastern portion of the Fairfield-Suisun Hydrologic Basin. Within this basin, water generally flows south to southeast toward Suisun Marsh, an 85,000-acre tidal marsh (CH2M HILL, 2001). Suisun Marsh drains into Grizzly and Suisun Bays. Water from these bays flows through the Carquinez Strait to San Pablo Bay and San Francisco Bay, which discharges into the Pacific Ocean near San Francisco.

Travis AFB lies in the southern portion of the Union Creek, Denverton Creek, and McCoy Creek watersheds. The headwaters of Union Creek are approximately 1 mile north of the Base, near the Vaca Mountains. Union Creek splits into two branches north of the Base. Onbase, the main (eastern) branch is impounded to create a recreational pond designated as the Duck Pond. At the exit from the Duck Pond, the creek is routed through an underground storm drainage system to the southeastern Base boundary, where it empties into an open creek channel.

Union Creek is the primary surface water drainage at Travis AFB (see Figure 3-1). Stormwater runoff flows into the creek through a network of pipes, culverts, and open drainage ditches.

The eastern portion of the Base is served by a drainage system that collects runoff along the runway and the inactive sewage treatment plant area and directs it to Denverton Creek and Denverton Slough. Denverton Creek is an intermittent stream near the Base that drains into Suisun Marsh.

The northwestern portion of the Base drains to the west toward the McCoy Creek drainage area. McCoy Creek is also an intermittent stream near the Base.

3.5.3 Floodplains

The most recent Flood Insurance Rate Map (with an effective date of May 4, 2009) issued by the Federal Emergency Management Agency (FEMA) indicates that the Base is in an area "with possible but undetermined flood hazards. No flood hazard analysis has been conducted" (FEMA, 2009a). An earlier FEMA map (dated February 2009) made available for advisory purposes, showed almost the entire Base to be within a 500-year floodplain (i.e., having a 0.2 percent annual chance of flooding). The February 2009 map showed that

only a small portion of the Base near the main gate is associated with the western branch of Union Creek and within the 100-year floodplain (i.e., having a 1 percent chance of annual flooding) (FEMA, 2009b).

3.5.4 Stormwater

Approximately 38 percent of Travis AFB consists of impervious areas. To prevent flooding, runoff from the impervious areas enters the Base stormwater drainage system. The storm drain system on Travis AFB consists of a series of underground storm drains and open ditches, which are divided into six drainage areas, Sites I through VI (see Figure 3-1). The stormwater drainage system is designed to accommodate a 10-year, 24-hour storm (Travis AFB, 2003a).

3.5.5 Wastewater

The wastewater system at Travis AFB consists of industrial wastewater pipes and connections to the sanitary sewer from lavatories, showers, and janitorial sinks from Base buildings and housing units. Waste water discharges at the south gate of the Base to the Fairfield-Suisun Sewer District waste water treatment plant.

3.6 Biological Resources

The Proposed Action at Travis AFB occupies a remnant portion of the Solano-Colusa Vernal Pool Region (Keeler-Wolf et al., 1998), characterized by periodic basins surrounded by upland herbaceous-dominant vegetation of the Sacramento Valley (U.S. Fish and Wildlife Service [USFWS], 2005). Descriptions of this vernal pool region serve as a regional context for the Proposed Action area.

The Solano-Colusa Vernal Pool Region covers the majority of Solano County, ranging northward from the low-lying plains adjacent to the Suisun Marsh and the Sacramento-San Joaquin Delta, through the Colusa Basin of western Sacramento Valley, to the vicinity of Princeton, Glenn County. It is best known for well-represented examples of northern claypan pools between Highway 113 and the Base. This is the only known region to contain the federally threatened Delta green ground beetle (*Elaphrus viridis*) and the federally endangered grass Crampton's tuctoria (*Tuctoria mucronata*), which distinguish this region from other vernal pools region defined by Keeler-Wolf et al (1998).

Agricultural practices, water diversion and impounding for waterfowl enhancement, development, and road construction have affected vernal pools in the region. Many of the vernal pool areas in the region have been converted to agriculture or developed for residential, commercial, or industrial uses.

The Solano Land Trust, California Department of Fish and Game, and Wilcox Ranch are targeting restoration of some of the less intensely altered agricultural lands (including former rice fields) through direct purchases, conservation easements, or other cooperative agreements. The Solano Land Trust and California Department of Fish and Game manage adjacent reserves to protect portions of the northern claypan (totaling approximately 2,300 acres). In addition, Wilcox Ranch, adjacent to Travis AFB on the east, is a preservation area under restricted land use.

A field survey to assess general biological conditions was conducted by CH2M HILL on February 24, 2011. The field survey included investigation of the vernal pool area in the southwestern part of the Proposed Action area as well as a pedestrian survey along the entire length of the proposed perimeter fence.

3.6.1 Vegetation

Vegetation around the Proposed Action area consists primarily of maintained grassy areas and landscape vegetation associated with the residential housing units' open space and walking trails. Historically, cattle and horse grazing were the predominant land use in this area. During the 1930s, extensive mining of soils and sandstone occurred immediately west of the Proposed Action area.

A portion of the 38.8-acre Castle Terrace natural resources preserve area is immediately to the west. The grasslands in this area are characterized by naturalized annual grasses and a mixture of naturalized and native herbaceous plants. Common species include rip-gut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), wild oat (*Avena fatua*), filaree (*Erodium cicutarium*), rose clover (*Trifolium hirtum*), minature lupine (*Lupinus bicolor*), English plantain (*Plantago lanceolata*), and sheep sorrel (*Rumex acetocella*). Native perennial bunchgrasses such as purple needlegrass (*Nasella pulchra*) are also present in scattered locations throughout the preserve. Seasonal swales, vernal pools, ponds, and constructed wetlands occur throughout the grassland community. Common species observed in vernal pool and seasonal wetland areas include semaphore grass (*Pleuropogon californica*), spikerush (*Eleocharis macrostachya*), coyote thistle (*Eryngium* sp.), and manna grass (*Glyceria occidentalis*).

3.6.2 Special-status Species

For the purposes of this EA, special-status species are defined as follows:

- Any species officially listed as federal endangered or threatened or any species that are candidates for federal listing as endangered or threatened under the Federal Endangered Species Act (ESA)
- California-listed threatened, endangered, or rare species under the California Endangered Species Act (CESA)
- Both ESA and CESA define species that are "threatened" and "endangered" as follows:
    - Endangered Species: Any species in danger of extinction throughout all or a significant portion of its range (ESA Section 3(6)).
    - Threatened Species: Any species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (ESA Section 3(20)).
    - Candidate Species: Plant and animal taxa considered for possible addition to the List of Endangered and Threatened Species. These are taxa for which the USFWS has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but issuance of a proposed rule is currently precluded by higher priority listing actions (61 CFR 7596 – 7613).

A list of species that potentially occur in the area of the Proposed Action has been compiled from the results of previous studies conducted at Travis AFB (see Table 3-4) as well as from information from the California Natural Diversity Database (2011) and the California Native Plant Society (2011). Preliminary database searches included the following nine U.S. Geological Survey quadrangles: Mt. Vaca, Allendale, Dixon, Fairfield North (499D), Elmira (498C), Dozier (498D), Fairfield South (482A), Denverton (481B), and Vine Hill (482D). Information on federally listed species for the Elmira quadrangle was also obtained from USFWS (USFWS, 2011).

TABLE 3-4
Existing Biological Resources Studies
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing Travis Air Force Base, California

Title	Author	Date
Basewide Ecological Habitat Assessment for Travis Air Force Base, California	Roy F. Weston, Inc.	1994
Assessment of Special-Status Plant and Animal Species at Travis Air Force Base, Solano County, California, Phase II Surveys.	Biosystems Analysis, Inc.	1993
California Tiger Salamander Habitat Assessment at Travis Air Force Base, Solano County, California	Rana Resources	2005
Results of First Year Special-Status Vernal Pool Invertebrate Surveys at Travis Air Force Base – Winter/Spring 2004/2005	EcoAnalysts, Inc.	2005
Results of Special-Status Vernal Pool Invertebrate Surveys at Travis Air Force Base	EcoAnalysts, Inc.	2006
Travis Air Force Base – Final Natural Resource Liability and Assessment Management Report	CH2M HILL	2006
Travis Air Force Base – Final Summary of Rare, Threatened, and Endangered Species Associated with Seasonal Wetlands	CH2M HILL	2006
California Tiger Salamander Breeding Habitat Assessment at Travis Air Force Base	University of California at Davis	2010

Fifteen special-status species (6 plants and 13 animals) were identified as having potential to occur within Travis AFB (see Table 3-5).

There are no reported occurrences of special-status species in the immediate Proposed Action area, but vernal pool fairy shrimp and the California tiger salamander (CTS), both of which are federally listed threatened species, have been found approximately 500 feet from the western side of the proposed perimeter fence (see Figure 3-2).

TABLE 3-5
Special-status Species Potentially Occurring at Travis AFB
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing
Travis Air Force Base, California

Species Scientific Name	Species Common Name	Protection Status	Presence
Plants			
Gratiola heterosepala	Boggs Lake hedge-hyssop	SE	Potential
Neostapfia colusana	Colusa grass	FT/SE	Potential
Lasthenia conjugens	Contra Costa goldfields	FE	Known
Tuctoria mucronata	Crampton's tuctoria	FE/SE	Potential
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	FT/SE	Potential
Trifolium amoenum	Showy Indian clover	FE	Potential
Animals			
Rana aurora draytonii	California red-legged frog	FT	Potential
Ambystoma californiense	California tiger salamander	FT	Known
Branchinecta conservatio	Conservancy fairy shrimp	FE	Potential
Elaphrus viridis	Delta green ground beetle	FT	Potential
Thamnophis couchi gigas	Giant garter snake	FT/ST	Potential
Buteo swainsoni	Swainson's hawk	CT	Potential
Desmocerus californicus dimorphus	Valley elderberry longhorn beetle	FT	Potential
Branchinecta lynchi	Vernal pool fairy shrimp	FT	Known
Lepidurus packardi	Vernal pool tadpole shrimp	FE	Potential
Rallus longirostris obsoletus	California clapper rail	FE	Potential
Hypomesus transpacificus	Delta smelt	FT	Potential
Oncorhynchus mykiss	Central Valley steelhead	FT	Potential
Oncorhynchus tshawytscha	Central Valley: spring-run winter-run Chinook salmon	FT FE	Potential Potential

Sources: Travis AFB, 2003a; California Department of Fish and Game, 2004

Notes:

FE = Federal Endangered
FT = Federal Threatened
SE = State Endangered
ST = State Threatened

3.6.3 Areas Subject to Regulation under Sections 404 and 401 of the Clean Water Act

Wetlands and other waters are ecological habitats protected under both federal and state laws and regulations. The Clean Water Act (CWA) is the primary statute providing protection of aquatic resources and is administered by the U.S. Army Corps of Engineers (USACE) and the California Regional Water Quality Control Boards. Any actions that

involve the placement of fill material into jurisdictional waters or wetlands must comply with Sections 404 and 401 of the CWA.

USACE regulates the discharge of dredge and fill material into Waters of the United States (including wetlands) under Section 404 of the CWA. Waters of the United States are defined as all navigable waters, including the following:

- All tidal waters
- All interstate waters and wetlands
- All other waters, such as lakes, rivers, streams (perennial or intermittent), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, that the use, degradation, or destruction of which could affect interstate commerce
- All impoundments of water mentioned above
- All tributaries to waters mentioned above
- Territorial seas
- All wetlands adjacent to waters mentioned above

The proposed perimeter fence would cross Union Creek (see Figure 3-2), which is a tributary of Hill Slough, which drains into Suisun Slough, which is part of the Sacramento-San-Joaquin Delta. Union Creek at the proposed perimeter fence crossing is approximately 25 feet wide and has shallow (1- to 2-foot-high) banks. The channel is filled with dense cattails (*Typha latifolia*). At this location, the perimeter fence would be installed along a gravel road that crosses the creek. The creek crosses beneath the gravel road through a culvert.

One vernal pool is near the southwestern corner of the Proposed Action area. While there is no direct hydrologic connection to the swale area to the west, there is the potential for overland flow from this vernal pool into the swale area to the west during extreme rainfall events. At the time of the February surveys, the vernal pool was inundated with up to 10 inches of water. Vegetation observed during the survey consisted primarily of spikerush.

3.6.4 Botanical Surveys

Botanical surveys have not been conducted in the Proposed Action area. Special-status plants are known to occur on Travis AFB from previous studies (see Table 3-5). Reported occurrences of Contra Costa goldfields approximately 1,400 feet west of the Proposed Action area (Earth Tech, 1998) have not been recently observed. Given the routinely maintained grassy areas associated with the Proposed Action, the potential for special-status plant species was considered low.

3.6.5 Wildlife Surveys

General wildlife surveys were conducted in the Proposed Action area in February, and bird, mammal, reptile, and amphibian species observed were recorded.

Several small mammal burrows and gopher throw were observed along the western boundary of the Proposed Action area. Wildlife species observed include common birds such as western meadowlark (*Sturnella neglecta*) and American crow (*Corvus brachyrhynchos*). Pacific chorus frogs (*Pseudacris regilla*) were heard, and egg masses were observed in the area around the vernal pool near the southwestern corner of the Proposed Action area. No special-status wildlife species were observed.

3.6.5.1 California Tiger Salamander

During 2008 vernal pool invertebrate monitoring, CTS larvae were discovered in the northeastern part of Travis AFB, in the Burke Property housing area approximately 1.6 miles northwest of the Proposed Action area (CH2M HILL, 2008). This area is approximately 500 feet southwest of the Proposed Action area (see Figure 3-2). CTS upland habitat is defined as habitat within 1.3 miles of a known breeding pool. Breeding pools are within approximately 500 feet of the western part of the Proposed Action area; therefore, the Proposed Action is within upland habitat for CTS. Several small mammal burrows were observed along the fence line along the western edge of the Proposed Action area during the biological field surveys.

3.6.5.2 Vernal Pool Branchiopod Surveys

There are numerous known occurrences of vernal pool fairy shrimp within approximately 500 feet of the Proposed Action footprint (see Figure 3-2). A single wet season survey of the vernal pool in the southwest corner of the Proposed Action footprint was conducted by CH2M HILL on February 24, 2011. No vernal pool fairy shrimp were observed at the time of the survey. Other aquatic invertebrates including seed shrimp (Ostracods), water boatman (Corixidae), aquatic snails (Gastropods) and beetles (Coleoptera) were observed in low numbers. This vernal pool was considered to provide suitable habitat for the vernal pool fairy shrimp.

3.6.6 Wetland Delineations

No formal wetland delineations have been conducted within or adjacent to the Proposed Action area footprint.

The proposed perimeter fence would cross Union Creek (see Figure 3-2), which is a tributary of Hill Slough, which drains into Suisun Slough, which is part of the Sacramento-San-Joaquin Delta. Union Creek at the proposed perimeter fence crossing is approximately 25 feet wide and has shallow (1- to 2-foot-high) banks. The channel is filled with dense cattails (*Typha latifolia*). At this location, the perimeter fence would be installed along a gravel road that crosses the creek. The creek crosses beneath the gravel road through a culvert.

One vernal pool is near the southwestern corner of the Proposed Action area. While there is no direct hydrologic connection to the swale area to the west, there is the potential for overland flow from this vernal pool into the swale area to the west during extreme rainfall events. At the time of the February surveys, the vernal pool was inundated with up to 10 inches of water. Vegetation observed during the wet season survey consisted primarily of spikerush.

3.7 Socioeconomic Resources

Socioeconomic resources include the population, income, employment, and housing conditions of a community or region of influence. The total population of Solano County, based on a 2006 estimate, is approximately 412,000 (U.S. Census Bureau, 2000). The Base's overall impact on the county and surrounding area is estimated to be in excess of $1.2 billion (Travis AFB, 2006).

The Base is in a rapidly growing part of the San Francisco Bay Area. Solano County grew at a rate 50 percent higher than the San Francisco Bay Area as a whole between 1990 and 2000. During the same period, Fairfield grew at twice the overall rate. This accelerated rate of growth is expected to continue, and more than 80,000 additional residents were expected to migrate to Solano County by 2010.

3.8 Cultural Resources

3.8.1 Cultural History

The region in which Travis AFB is located was once inhabited by the Southern Patwin (or Wintuan) tribe of Native Americans. The early inhabitants of the region established tribelets (i.e., villages) adjacent to freshwater marshes and hunted, gathered, and fished for subsistence. The primary tribelets in a region were the Suisun and Talenas. When the Spanish missionaries arrived circa A.D. 1750,a proto-agriculture culture existed in the region (Travis AFB, 2003b). The Southern Patwin were adversely affected by mission activities, disease, and disruption by gold miners, who eventually became settlers and had largely abandoned the area before epidemics of malaria and smallpox in 1833 and 1837. Descendants of the Southern Patwin currently reside in the northern part of their former range in the Sacramento Valley (URS Corporation, 2004).

Travis AFB was originally created as a temporary bomber base in 1942. The location was quickly recognized as an excellent air transport facility, and it was commissioned as the Fairfield-Suisun Army Air Base in 1943. In 1950, the Base was renamed after a former commander of the 9th Heavy Bombardment Wing, Brigadier General Robert Falligant Travis. Today, Travis AFB is known as "the Gateway to the Pacific" and is among the largest and busiest military air terminals in the U.S.

3.8.2 Cultural Resource Investigations and Resources

Since 1909, 16 cultural resource studies have been conducted at Travis AFB and surrounding areas. These studies identified 10 archeological sites and 27 structures on Base property that were potentially significant. Three of the 10 archeological sites were considered potentially prehistoric, and the remaining 7 were considered potentially historic. All 10 sites were evaluated for eligibility for the National Register of Historic Places (NRHP) and were deemed not eligible. The 27 structures, all associated with the Cold War, are potentially eligible for inclusion on the NRHP (Travis AFB, 2003b).

3.9 Land Use

Travis AFB occupies approximately 5,128 acres near the center of Solano County, California. The Base is less than 5 miles east of downtown Fairfield and approximately 8 miles south of downtown Vacaville (see Figure 1-1).

Land uses at Travis AFB are grouped into 12 functional categories, as follows:

- **Administrative –** uses include personnel, family services, police and security, wing/ group headquarters, legal services, communications, gate and visitor management, and other support facilities.
- **Aircraft Operations and Maintenance –** uses include aircraft operations, aircraft maintenance, aircrew and maintenance training facilities, and passenger and freight terminal facilities.
- **Airfield –** uses consist of pavement system, related open space, navigational aids, and airfield and airway clearance surfaces.
- **Community (Commercial) –** uses include the exchange, commissary, banking, dining facilities, eating establishments, indoor recreation facilities, and service stations. Supports the needs of personnel and their families.
- **Community (Service) –** uses include schools, education centers, library, chapel, post office, and child development facilities. Supports the needs of personnel and families.
- **Housing (Accompanied) –** uses include family housing, mobile home parks, and temporary lodging facilities.
- **Housing (Unaccompanied) –** uses include dormitories for bachelors and quarters for visiting personnel.
- **Industrial –** uses include fire stations, base supply and equipment complex, fuel facilities, vehicle maintenance, civil engineer complex, open storage, utilities infrastructure, emergency response, ordinance and weapons storage, and other industrial uses.
- **Medical –** uses include medical, dental, and Veterans Administration clinics, veterinary clinics, and bioenvironmental engineering facilities.
- **Open Space –** uses include conservation and preservation areas, safety, security, and buffer zones including spaces that are unsuitable for development.
- **Outdoor Recreation –** uses include activities such as golf and swimming, park and picnic facilities, and recreation equipment checkout and storage.
- **Water –** uses include open space, outdoor recreation activities, and buffer space between incompatible uses; generally includes ponds, streams, lakes, shorefronts and oceans.

Land directly north of Georgetown MFH is within the city of Fairfield. According to the Fairfield General Plan (City of Fairfield, 2004), this area is designated Residential Low

Medium (4.5 to 8.0 dwelling units per acre) or Travis Reserve. The area directly north of Georgetown MFH is undeveloped.

3.10 Transportation System

Information regarding the transportation system has been summarized from the *General Plan for Travis Air Force Base, California* (Travis AFB, 2006). The road network serving Travis AFB consists of several major thoroughfares including Travis Avenue, Ragsdale Street/Cannon Drive, Burgan Boulevard, Parker Road, Hickam Avenue, and Hangar Avenue. Minor streets branching off from these main roadways are Skymaster Drive, Broadway Street, W Street, Cordelia Avenue, and 1st Street, which serve as collector facilities for the Base. Facilities within Travis AFB's transportation system include parking areas, sidewalks, bicycle paths, mass transit, a passenger/cargo terminal, and a railhead. The maximum design capacity of onbase roads is 14,000 pounds (Highway Class).

The road network serving the northeast corner of Travis AFB, adjacent to Georgetown MFH, consists of Burgan Boulevard (onbase), and Gate Road (offbase) (see Figure 2-2). Gate Road provides access to Georgetown MFH from Solano County.

3.11 Safety and Occupational Health

Safety and occupational health are managed by BioEnvironmental (60AMDS/SGPB). Construction site safety and accident prevention are ongoing activities at any Air Force job site. As part of the contracts for construction services, standard terms and conditions include safety as a priority. Areas of concern include compliance with regulations typical for construction projects, such as confined-space regulations, handling of hazardous materials, minimum personal protection equipment standards, and limited access to the construction area.

3.12 Airfield Operations

Airfield operations refer to any takeoff or landing at an air base. The activity may be part of a training maneuver or defense-related operations. In fiscal year 2003, the air crews at Travis AFB flew more than 68,000 hours, hauling 300 million pounds of cargo and 93,000 passengers (Travis AFB, 2003c).

3.13 Environmental Management

Environmental management includes geology, soils, and pollution prevention. The following sections describe the regional geology of Travis AFB, the soil types present, and pollution prevention plans in effect at the Base.

3.13.1 Geology

Travis AFB is on the western edge of the Sacramento Valley segment of the Great Valley Geomorphic Province. The Coast Range Geomorphic Province, which consists of folded

and uplifted bedrock mountains, is west of Travis AFB (Thomasson et al., 1960; Olmsted and Davis, 1961).

The land surface structure (geomorphology) of Travis AFB is characterized by gently sloping alluvial plains and fans. These coalescing, low-relief fans were deposited by Ulatis, Union, Alamo, Laurel, and Suisun Creeks.

The geology at Travis AFB shows unconsolidated silty clays at the surface and silts and fine sands at 15 to 20 feet deep. The average water table at the Base is 10 feet below grade (Travis AFB, 2003a). Topographic relief in the form of low ridges is caused by outcroppings of sedimentary rock in the area.

Portions of the north part of the Base are underlain by alluvium of recent origin, consisting of sand, gravel, silt, and clays varying from 5 to 60 feet thick. The major portion of the Base is underlain by older alluvium, consisting of inter-fingering lenses of sands, gravel, silts, and clays (Travis AFB, 2003a).

Bedrock at Travis AFB consists of consolidated to semi-consolidated sedimentary rock. The alluvium ranges from 0 to approximately 70 feet thick, but is generally less than 50 feet thick. West of Travis AFB, the alluvium increases to more than 200 feet thick (Thomasson et al., 1960).

3.13.2 Soils

Soil develops from geologic material exposed at the earth's surface as the material is altered through physical, chemical, and biological processes. The nature of soil is in part a function of climate, surface slope, time of exposure at the surface, and the type of original (parent) material. Soils at Travis AFB are classified as alfisols, which are primarily silt and clay loam soils that exhibit low permeability and poor drainage characteristics. The lower layers of most of the soils at Travis AFB are dense and compact. They are typically impervious to air and discourage the penetration of roots or water. Therefore, little drainage occurs through the soil. In general, the soils at Travis AFB have been considerably altered by heavy construction and imported fill (Travis AFB, 2003a).

3.13.3 Pollution Prevention

Travis AFB has an active Pollution Prevention Program to reduce the generation of wastes through a hierarchy of actions ranging from source reduction (preferred choice) to recycling, treatment, and disposal. The *Travis AFB Pollution Prevention Management Action Plan* (P2MAP) (Travis AFB, 2004c) defines the framework to accomplish these actions. The plan analyzes processes that use hazardous materials and generate hazardous waste streams, and evaluates options to reduce the volume or toxicity of generated wastes.

3.14 Environmental Justice and Protection of Children

EO 12898 (1994) requires each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high human health or environmental effects of its programs, policies, and activities on minority populations and low income populations." A minority population is composed of people who identify themselves to the U.S. Census Bureau as American Indian or Alaskan Native,

961 Asian or Pacific Islander, Black or African American, or of Hispanic origin, and where such
962 population exceeds 50 percent of the population in an area or where the minority
963 population percentage of the affected area is meaningfully greater than the minority
964 population percentage in the general population (CEQ, 1997).

965 Each year, the U.S. Census Bureau defines the national poverty thresholds, which are
966 measured in terms of household income and the number of people within the household.
967 Individuals falling below the poverty threshold ($21,386 for a household of four in 2007)
968 are considered low-income individuals (U.S. Census Bureau, 2008).

969 Solano County is a large, demographically diverse county, with communities ranging from
970 the urban areas of Vallejo and Fairfield to small rural towns, such as Dixon and Rio Vista.
971 The estimated population of Solano County in 2006 was 411,680, with 63.9 percent White;
972 15.4 percent African American; and 22.0 percent Hispanic (U.S. Census Bureau, 2000).

973 Vallejo, the largest city in Solano County, had an estimated population of 119,708 in 2003.
974 Vallejo is more diverse than the county as a whole; its population was 36 percent White,
975 23.7 percent African American, and 15.9 percent Hispanic. Approximately 10 percent of the
976 population in Vallejo is at or below the poverty level. Fairfield is the second largest city in
977 Solano County, with an estimated population of 102,762 in 2006. Fairfield is the closest city
978 to Travis AFB. Fairfield more closely reflects the cultural composition of the county. The
979 greater part of the population in Fairfield is White (56.2 percent), with lower percentages of
980 Hispanic (18.8 percent) and African American (15.0 percent). Approximately 9.3 percent of
981 the population lives at or below the poverty level (U.S. Census Bureau, 2000).

982 Travis AFB employs approximately 15,000 people. In 2006, the Travis AFB population
983 consisted of approximately 7,944 active duty personnel; 3,384 Air Force, Army Reserve,
984 and National Guard; and 9,225 active duty dependents. In addition, the Base population
985 included 1,892 appropriated fund civilian personnel and 1,662 non-appropriated fund
986 civilians, contractors, and private business people (Travis AFB, 2006).

987 Although demographic data for Travis AFB were not available, the racial composition of the
988 Air Force serves as an approximation of the racial composition of the Base. In 2010, the
989 Air Force was 73 percent White, 14 percent Black or African American, and the remaining
990 13 percent composed of other races (U.S. Air Force, 2010).

991 Children are present on Travis AFB in family housing, child development centers, the
992 Travis AFB youth center, schools, and playgrounds (Travis AFB, 2006).

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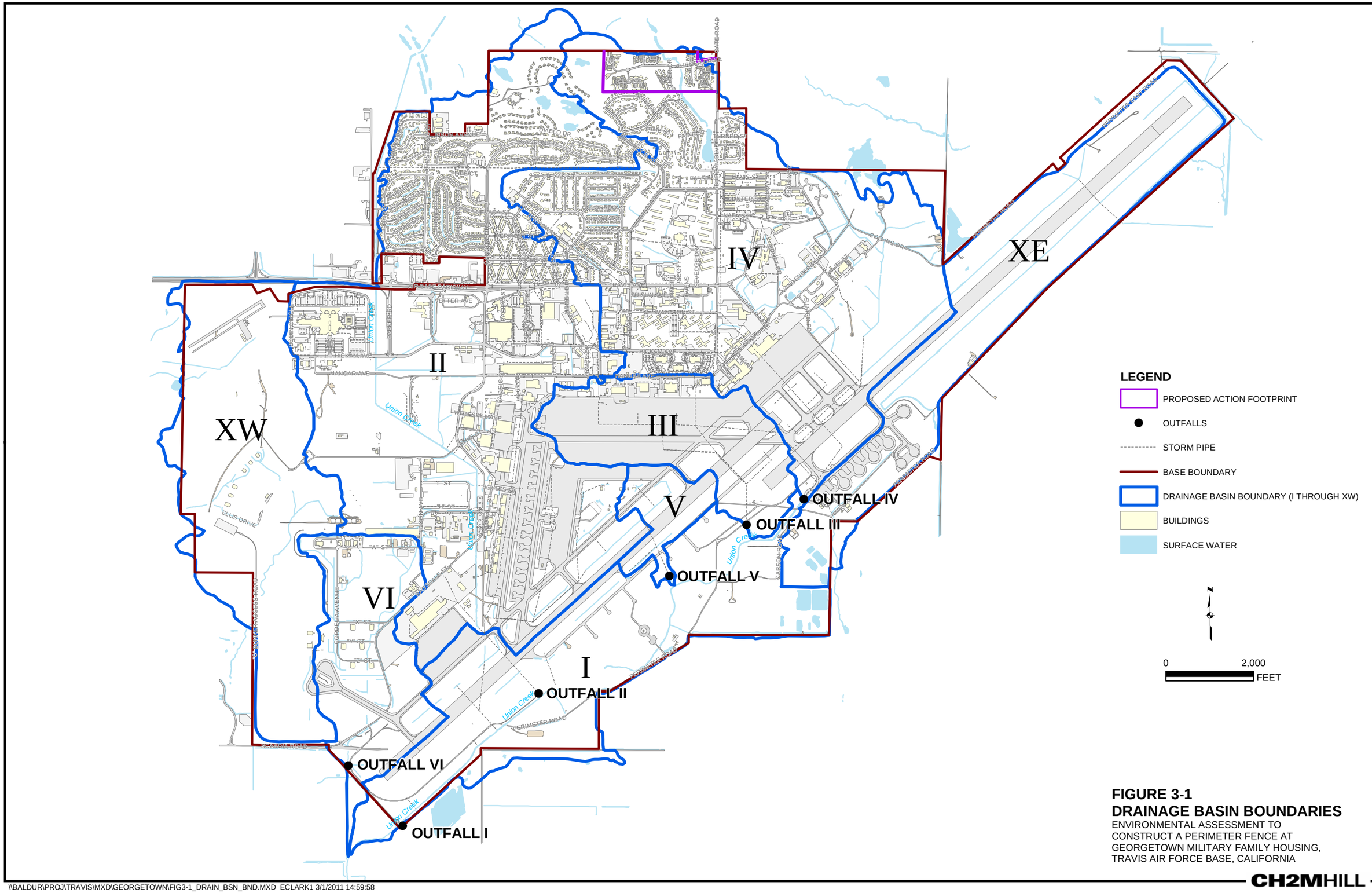
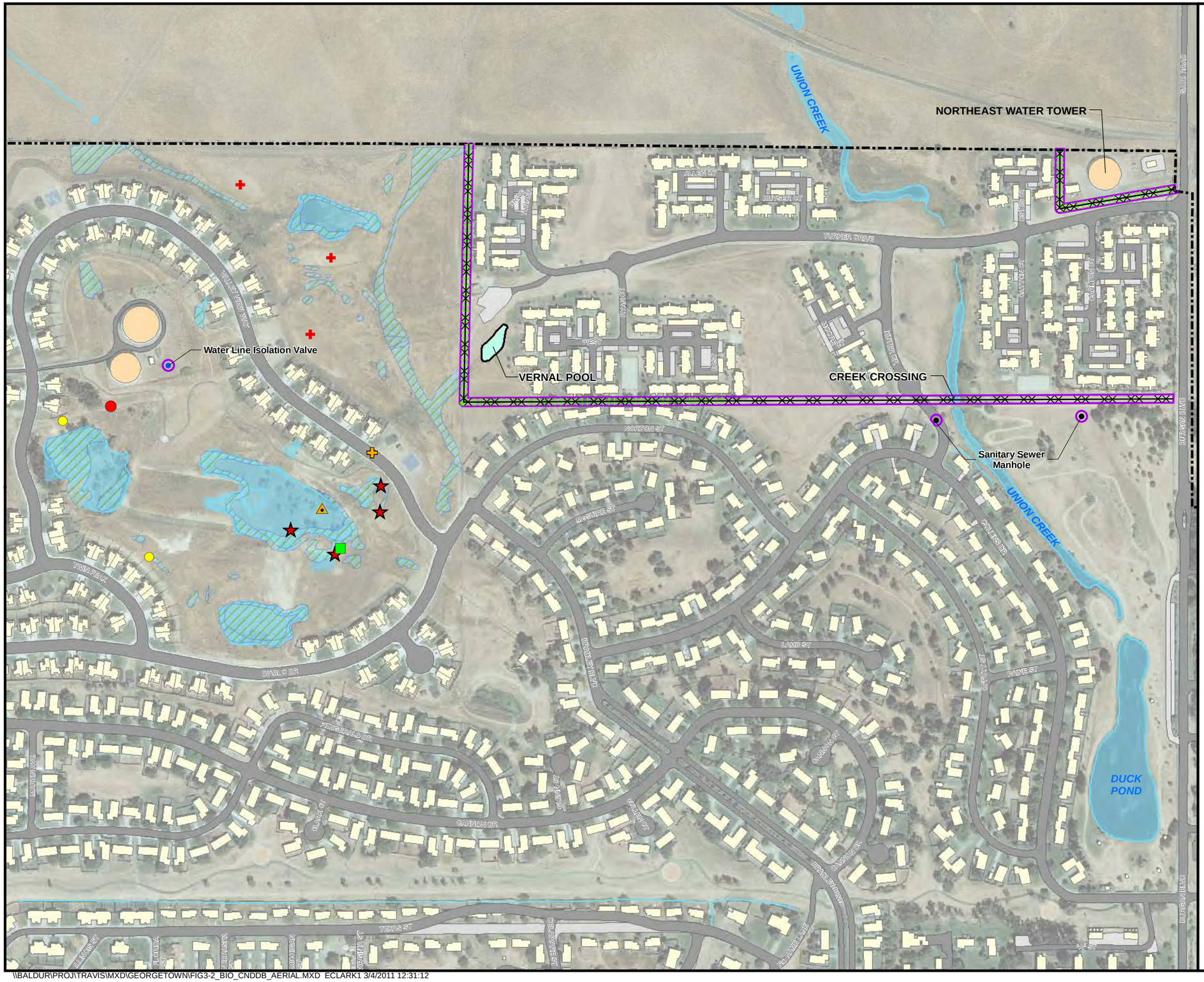
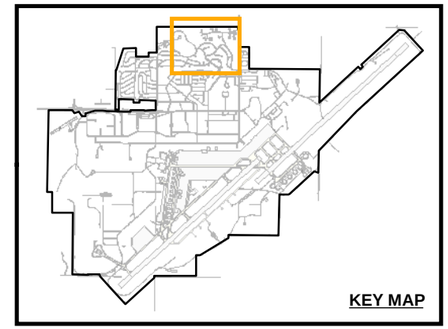


FIGURE 3-1
DRAINAGE BASIN BOUNDARIES
ENVIRONMENTAL ASSESSMENT TO CONSTRUCT A PERIMETER FENCE AT GEORGETOWN MILITARY FAMILY HOUSING, TRAVIS AIR FORCE BASE, CALIFORNIA

CH2MHILL

\\BALDUR\PROJ\TRAVIS\MXD\GEORGETOWN\FIG3-1_DRAIN_BSN_BND.MXD ECLARK1 3/1/2011 14:59:58





LEGEND

- PROPOSED ACTION FOOTPRINT
- EXISTING FENCE PROPOSED FOR DEMOLITION
- PROPOSED PERIMETER FENCE
- BASE BOUNDARY
- EXISTING FENCE
- WETLAND
- SURFACE WATER
- WATER TOWER
- BUILDING
- PARKING
- ROAD
- DRIVEWAY

Vernal Pool Fairy Shrimp *Branchinecta lynchi*

- ECOANALYSTS/CH2M HILL 2005
- HELM 1999

Contra Costa Goldfields *Lasthenia conjugens*

- EARTH TECH 1998

California Tiger Salamander *Ambystoma Californiense*

- ECOANALYSTS/CH2M HILL 2005

CALIFORNIA NATURAL DIVERSITY DATABASE

- CALIFORNIA TIGER SALAMANDER
- VERNAL POOL FAIRY SHRIMP
- WESTERN POND TURTLE

NOTES:

1. ENTIRE AREA OF INTEREST IS WITHIN 1.3-MILE BUFFER FROM CTS OBSERVED AT CASTLE TERRACE
2. CALIFORNIA NATURAL DIVERSITY DATABASE, 2011 GENERAL POINTS REFLECT ALL KNOWN OCCURRENCES WITHIN 1/4 MILE AREA

0 350 Feet

FIGURE 3-2
BIOLOGICAL RESOURCES AND SENSITIVE SPECIES

ENVIRONMENTAL ASSESSMENT TO CONSTRUCT A PERIMETER FENCE AT GEORGETOWN MILITARY FAMILY HOUSING, TRAVIS AIR FORCE BASE, CALIFORNIA

CH2MHILL

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SECTION 4

Environmental Consequences

4.1 Introduction

This section evaluates potential impacts of the two alternatives described in Section 2. Potential impacts to human health and the environment were evaluated by comparing the Proposed Action (Alternative 2) to the No Action Alternative (Alternative 1). The section for each environmental resource or issue assesses the anticipated direct and indirect impacts, considering short- and long-term project effects.

As described in this section, no significant adverse environmental impacts would occur with Alternative 2, Proposed Action.

4.2 Air Quality

4.2.1 Laws and Regulations

4.2.1.1 Federal

Under the CAA, as amended in 1977 and 1990, EPA established nationwide air quality standards to protect public health and welfare with an adequate margin of safety. The federal standards (NAAQS) represent the maximum allowable atmospheric concentrations for the following seven pollutants:

- Carbon monoxide
- Lead
- Nitrogen dioxide
- Ozone
- PM_{10}
- $PM_{2.5}$
- Sulfur dioxide

The 1977 CAA amendment required each state to develop and maintain a state implementation plan (SIP) for each criteria pollutant that violates the applicable NAAQS. The SIP minimizes emissions of pollutants that exceed ambient thresholds to achieve compliance with the NAAQS. In 1990, the CAA was amended to strengthen regulation of stationary and mobile emission sources for criteria pollutants.

Under the conformity provisions of the CAA, no federal agency can approve or undertake a federal action, or "project," unless the project complies with the SIP. These conformity provisions were enacted so that federal agencies would contribute to efforts to attain the NAAQS. EPA has issued two conformity regulations: (1) transportation conformity rules that apply to transportation plans and projects, and (2) general conformity rules that apply

to all other federal actions. A conformity determination[1] is only required for the alternative that is selected and approved. The general conformity determination is issued as a written finding after a minimum 30-day public comment period on the draft determination.

Applicable only in areas designated as nonattainment or maintenance for NAAQS, the general conformity rule prohibits any federal action that does not comply with the applicable air quality attainment plan or SIP. General conformity applicability analysis requires quantification of direct and indirect construction and operation emissions for the project, and comparison of those emission levels to baseline emission levels. If the differences in emissions (the net emissions associated with the project) exceed the general conformity de minimis thresholds for the peak year or any milestone year for attainment of standards, additional general conformity determination is required.

An action is exempt from the conformity rule (i.e., the action is presumed to conform) if the total net project-related emissions (construction and operation) are less than the de minimis thresholds established in the conformity rule. An action that produces emissions that exceed conformity thresholds is required to demonstrate conformity with the SIP through mitigation or other accepted practices.

4.2.1.2 California

CARB oversees California air quality policies. The California Clean Air Act, passed in 1988, requires local air districts to develop and implement strategies to attain the CAAQS. The earliest CAAQS were established in 1969, pursuant to the Mulford-Carrell Act. CAAQS are generally more stringent than the NAAQS, and limit the following four additional pollutants: hydrogen sulfide, sulfates, vinyl chloride, and visibility-reducing particles.

The SIPs required by federal law are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, and permitting), district rules, state regulations, and federal controls. CARB is the lead agency for all purposes related to the SIP. Local air districts and other agencies, such as the Bureau of Automotive Repair, prepare SIP elements and submit them to CARB for review and approval. CARB submits SIP revisions to EPA for approval and publication in the *Federal Register*.

4.2.1.3 Bay Area Plans and Programs

BAAQMD implements standards and policies established by CARB. BAAQMD rules and regulations apply to all sources of emissions within the nine-county Bay Area region, including western Solano County. The Bay Area air quality plans address how the San Francisco Bay Area will attain NAAQS and CAAQS. The plans and regulations require that new and modified stationary emission sources must apply for air quality permits and, if applicable, implement control measures and install emission-control equipment.

4.2.1.4 Greenhouse Gas Issues

Climate change has been a concern since at least 1988, as evidenced by establishment of the United Nations and World Meteorological Organization Intergovernmental Panel on

[1] A conformity determination demonstrates how an action would conform to the applicable implementation plan. If the emissions cannot be reduced sufficiently and air dispersion modeling cannot demonstrate conformity, either a mitigation plan or a plan to offset the emissions would need to be produced.

Climate Change, and efforts devoted to greenhouse gas (GHG) emissions reduction and climate change research and policy have increased dramatically in recent years. The following are brief summaries of federal, state, and local regulatory actions under the CAA and other statutory authorities to address issues related to climate change.

Federal. The following are federal GHG concerns:

- **Final Mandatory GHG Inventory Rule** – In response to the fiscal year (FY) 2008 Consolidated Appropriations Act (House of Representatives [H.R.] 2764; Public Law 110–161), EPA issued the Final Mandatory Reporting of Greenhouse Gases Rule on September 22, 2009. In general, the rule requires suppliers of fossil fuel and industrial GHGs, manufacturers of vehicles and engines outside the light-duty sector, and facilities that emit 25,000 metric tons or more of GHG each year to submit annual reports to EPA. The rule is intended to collect accurate and timely emissions data to guide future policy decisions regarding climate change.

- **Executive Order 13514 –** Signed on October 5, 2009, EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, introduced new GHG emissions management requirements for the federal government. EO 13514 requires federal agencies to establish percentage reduction targets for GHG emissions in absolute terms by FY 2020. The reduction targets are relative to the FY 2008 baseline condition and are subject to review and approval by the Office of Management and Budget and the CEQ. EO 13514 required agencies to develop an inventory of their absolute (total metric tons of carbon dioxide [CO_2] equivalent) GHG emissions for FY 2010 by January 2011. Each year thereafter, agencies must submit an annual inventory for the preceding fiscal year to the Office of Management and Budget and CEQ.

- **Final Endangerment Finding –** On December 7, 2009, the EPA Administrator signed the following two findings regarding GHG under Section 202(a) of the CAA: (1) six key, well-mixed GHGs constitute a threat to public health and welfare, and (2) the combined emissions from motor vehicles cause and contribute to climate change.

- **EPA and National Highway Traffic Safety Administration (NHTSA) Regulations to Reduce Greenhouse Gas Emissions and Fuel Use for Passenger Cars and Commercial Trucks –** On April 1, 2010, EPA and NHTSA announced a joint final rule establishing a historic national program that will reduce GHG emissions and improve fuel economy for new cars and light trucks sold in the United States. Building on this successful collaboration, EPA and NHTSA have begun work on two new joint rulemakings: (1) develop the first-ever fuel efficiency and GHG emissions standards for commercial trucks, and (2) adopt the second phase of GHG and fuel economy standards for light-duty vehicles. These actions, as announced by President Obama on May 21, 2010, will reduce GHG emissions and fuel use from both light- and heavy-duty vehicles.

- **Final GHG Tailing Rule –** On May 13, 2010, EPA issued a final rule that establishes thresholds for GHG emissions that define when permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for industrial facilities. This final rule "tailors" the requirements of these CAA permitting programs to limit which facilities will be required to obtain Prevention of Significant Deterioration and Title V permits. Facilities responsible for nearly 70 percent of the national GHG emissions from stationary sources will be subject to permitting

requirements under this rule. This includes the nation's largest GHG emitters: power plants, refineries, and cement production facilities. Emissions from small farms, restaurants, and all but the largest commercial facilities are not covered by these programs at this time.

State. California is taking action to reduce GHG emissions. In June 2005, Governor Schwarzenegger signed Executive Order S-3-05 to address climate change and GHG emissions in California. In 2006, the California State Legislature signed the Global Warming Solutions Act of 2006 or AB 32, which provides the framework for regulating GHG emissions in California. This law requires CARB to design and implement emission limits, regulations, and other measures such that statewide GHG emissions are reduced in a technologically feasible and cost-effective manner to 1990 levels by 2020. The statewide 2020 emissions limit is 427 million metric tons carbon dioxide equivalent (CO_2e) (CARB, 2007a). Carbon dioxide emissions account for approximately 90 percent of the statewide GHG emissions (CARB, 2007a).

Senate Bill 97 was signed into law in August 2007. The Senate Bill required the Office of Planning and Research (OPR) to prepare, develop, and transmit to the Resource Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions by July 1, 2009. As directed by Senate Bill 97, the OPR developed recommended amendments to California Environmental Quality Act (CEQA) Guidelines for addressing GHG emissions. These amendments to CEQA Guidelines provide guidance regarding the analysis and mitigation of GHG emissions and the effects of GHG emissions in draft CEQA documents. The recommended amendments were approved by the Natural Resource Agency and became effective on March 18, 2010.

The AB 32 Scoping Plan contains the main strategies California will use to reduce GHG emissions that cause climate change. The scoping plan has a range of GHG reduction actions, which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 cost of implementation fee regulation to fund the program. The first regulation adopted by CARB pursuant to AB 32 was the regulation requiring mandatory reporting of GHG emissions. The regulation requires large industrial sources emitting more than 25,000 metric tons of CO_2 per year to report and verify their GHG emissions from combustion of both fossil fuels and biomass-derived fuels. The California Cap and Trade program is being developed and will be implemented by 2012.

Currently, however, no federal or state agency has adopted a quantitative threshold that can be used to evaluate the significance of an individual project's contribution to GHG emissions in the context of NEPA.

Local. On June 2, 2010, BAAQMD adopted the proposed thresholds of significance in the updated CEQA Air Quality Guidelines (BAAQMD, 2010b). The thresholds include the GHG emission threshold for project operation; there is no threshold for project construction.

4.2.2 Air Quality Impacts

4.2.2.1 Alternative 1 – No Action

Under the No Action Alternative, construction would not occur and air pollutant emissions associated with construction would not be generated. Emissions from vehicle operations would not change from current conditions. Therefore, under the No Action Alternative, no air quality impacts would occur.

4.2.2.2 Alternative 2 – Proposed Action

Construction Emissions. Construction of the perimeter fence at Georgetown MFH would take approximately 45 working days from July 1, 2011, through August 14, 2011. The total construction footprint would be approximately 3 acres. Construction emissions are expected from engine exhaust from the additional vehicle trips by construction workers, delivery trucks, and offroad construction equipment. These emissions would primarily consist of carbon monoxide, nitrogen oxide, PM_{10}, $PM_{2.5}$, sulfur dioxide, and volatile organic compounds (VOC). In addition, vehicle travel on unpaved roads would result in fugitive dust emissions. Construction equipment and vehicle emissions were estimated using the default emission factors and equipment settings in URBEMIS2007 (CARB, 2007b), the projected construction duration, and estimated hours of construction equipment operations. Fugitive dust emissions from vehicle travel on unpaved roads were estimated using the equation in Appendix B of the URBEMIS2007 User's Guide (Jones & Stokes Associates, 2007).

Emissions associated with worker commutes were estimated using the expected number of vehicle miles traveled by the workers. To be conservative, delivery trucks used for the construction were assumed to be heavy-duty trucks. Vehicle emission factors were calculated using EMFAC2007 (CARB, 2007c) emission factors for BAAQMD for 2011.

Table 4-1 lists the estimated construction emissions for the Proposed Action. Detailed construction emission calculations are provided in Appendix B.

TABLE 4-1
Estimated Construction Emissions for Proposed Action
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing
Travis Air Force Base, California

Emission Source	VOC (ton/yr)	CO (ton/yr)	NO_x (ton/yr)	SO_2 (ton/yr)	PM_{10} (ton/yr)	$PM_{2.5}$ (ton/yr)	CO_2 (ton/yr)
Construction Equipment	0.046	0.22	0.34	0.0004	0.022	0.022	37.2
On-road Vehicles	0.06	2.61	0.13	0.0002	0.0024	0.001	21.9
Fugitive Dust	NA	NA	NA	NA	0.041	0.041	NA
Total	**0.11**	**2.83**	**0.48**	**0.0007**	**0.066**	**0.065**	**59.2**

Notes:
NA = not applicable
NO_x = nitrogen oxide

The Proposed Action would cause temporary, short-term air quality impacts as a result of construction emissions. Construction-related impacts are expected to be local (i.e., confined to the construction site area) and limited to the duration of the construction activities.

Project construction would implement the applicable fugitive dust control measures defined in BAAQMD's CEQA Air Quality Guidelines (BAAQMD, 2010b).

No operation emissions are expected after the Proposed Action is constructed. Therefore, operation of the Proposed Action would not cause adverse air quality impacts, and no further analysis is required.

General Conformity. The CAA established programs and permitting processes designed to protect and improve air quality. Section 176(c) of the CAA Amendment of 1990, 42 USC 7506(c), established a conformity requirement for federal agencies, which has been implemented by 40 CFR 93, Subpart B. A general conformity applicability analysis for the project has been performed (see Appendix C) and is summarized in this section.

The Proposed Action would be within the Basin in Solano County, which attains or is unclassified for all criteria pollutants except the 8-hour ozone and $PM_{2.5}$ NAAQS. In addition, the urbanized areas of Solano County (which include the area occupied by Travis AFB) are maintenance areas for carbon monoxide. As a result, carbon monoxide, $PM_{2.5}$, and ozone precursors (nitrogen oxide and VOC) are subject to general conformity requirements. In accordance with the air conformity requirements of 40 CFR Sections 51.853 and 93.153(b)(1), the de minimis threshold is 100 tons/year for ozone precursors (VOCs and nitrogen oxide), PM $_{2.5}$, and sulfur dioxide (a $PM_{2.5}$ precursor), per federal action. The de minimis threshold for a carbon monoxide maintenance area is 100 tons/year per federal action. The annual emission increases associated with the Proposed Action and the comparisons with the de minimis thresholds are shown in Table 4-2. Emissions of carbon monoxide, nitrogen oxide, sulfur dioxide, $PM_{2.5}$, and VOC during construction are below the de minimis thresholds. On the basis of the conformity applicability criteria, the Proposed Action conforms to the most recent EPA-approved SIP; therefore, the project is exempt from the CAA conformity requirements and does not require a detailed conformity demonstration.

TABLE 4-2
General Conformity Applicability for Proposed Action
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing Travis Air Force Base, California

	Annual Emissions (tons/year)				
Activity	**VOC**	**CO**	**NO_x**	**SO_2**	**$PM_{2.5}$**
Construction (2011)	0.11	2.83	0.48	0.0007	0.065
Operation (2011 and after)	0	0	0	0	0
De minimis threshold	100	100	100	100	100

4.3 Noise

This section describes noise impact criteria and discusses potential project-related noise impacts. Potential future noise impacts were determined by analyzing the anticipated changes in noise exposure attributable to construction-related activities under No Action

and the Proposed Action. The portion of the Base that includes Georgetown MFH is within the 60-65 and under noise contour of Travis AFB (Travis AFB, 2003a).

The fundamental measure of sound levels is expressed in decibels using a logarithmic scale. Noise is generally defined as sound that is undesirable for the following reasons:

- It is intense enough to damage hearing.
- It interferes with speech communication and sleep.
- It is annoying.

The Federal Interagency Committee on Urban Noise has developed land use compatibility guidelines for noise and provides recommended noise ranges for land use categories based on this committee's findings. The Air Force has established land use noise compatibility criteria consistent with those published by the Federal Interagency Committee on Urban Noise in the *Guidelines for Considering Noise in Land Use Planning and Control* (1980).

CNEL values of 60 dB and less are generally compatible with all land uses; 60 dB is the incompatibility threshold for residential and other noise-sensitive land uses, including schools, hospitals, and religious facilities. Commercial, industrial, and other types of recreational land uses (e.g., sports arenas, golf courses, amusements parks) are generally considered compatible with annual CNEL ranges between 70 and 75 dB, if measures are incorporated into the design and construction of structures associated with these land uses. Figure 4-1 shows common sounds and their corresponding dB levels.

4.3.1 Alternative 1 – No Action

Under the No Action Alternative, construction would not occur, and noise levels similar to current levels would exist. Therefore, under the No Action Alternative, no noise impacts would occur.

4.3.2 Alternative 2 – Proposed Action

Typical construction-related noise is expressed in terms of schedule, equipment used, and types of activities. The noise level would vary during the construction period, depending on the type of construction activity. In addition, demolition and construction activities would not be concentrated in any one location along the perimeter fence line for an extended time.

Construction can generally be divided into the following five phases, in which different types of construction equipment are used (Barnes et al., 1977; Miller et al., 1978):

1. Site preparation and excavation
2. Concrete pouring
3. Steel erection
4. Mechanical
5. Cleanup

The EPA Office of Noise Abatement and Control and the Empire State Electric Energy Research Company studied noise from individual pieces of construction equipment and various construction sites (Barnes et al., 1977). Use of these data is conservative because, since these studies, public concerns about the adverse effects of noise have resulted in the inclusion of noise control measures in construction equipment design.

The loudest equipment types generally operating at a site during each construction phase are presented in Table 4-3. The long-term composite average or equivalent site noise level, representing noise from all equipment, also is presented in the table. The composite levels are occasionally lower than the individual levels because the loudest pieces of equipment would not operate continuously throughout the construction phase. Table 4-3 shows the noise levels expected 50 feet from the site during construction, according to the types of construction activities.

TABLE 4-3
Typical Construction Equipment and Composite Site Noise Levels
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing
Travis Air Force Base, California

Construction Phase	Loudest Construction Equipment	Equipment Noise Level (dB) at 50 feet	Composite Site Noise Level (dB) at 50 feet
Site Preparation and Excavation	Dump Truck	91	89
	Backhoe	85	
Concrete Pouring	Truck	91	85
	Concrete Mixer	85	
Steel Erection	Derrick Crane	88	89
	Jackhammer	88	
Mechanical	Derrick Crane	88	84
	Pneumatic Tools	86	
Cleanup	Rock Drill	98	79
	Truck	91	

Source: Barnes et al., 1977.

Depending on the source and the types of activities, noise associated with construction activities would be temporary, occur only during daytime hours, and vary in levels. A residential housing area is approximately 120 feet south of the proposed perimeter fence line (south of Georgetown MFH). Residential housing could experience a slight elevation in noise levels during demolition and construction activities. The noise would be temporary and would not be focused in one location along the fence line for an extended time. Noise from disconnection of utilities would be temporary and short in duration. No schools or churches are within one-half mile of the construction footprint. Because construction noise would be temporary, and occur only during daytime hours, noise impacts to nearby residents resulting from demolition and construction activities would be less than significant. No noise impacts are expected from operation of the Proposed Action.

4.4 Hazardous Materials, Wastes, Environmental Restoration Program Sites, and Stored Fuels

Congress passed RCRA in 1976 to protect human health and the environment from the mishandling of solid and hazardous waste and to encourage the conservation of natural resources. Regulations adopted by EPA in 40 CFR 260 through 279 implement RCRA. In California, hazardous material and hazardous waste are regulated under Title 22 of the Code of California Regulations, Article 4.5.

Travis AFB implements procedures for handling hazardous materials and managing and disposing of hazardous wastes. The procedures are detailed in the following guidelines:

- Air Force Instruction 32-7086, *Hazardous Materials Management* (AMC, 2006)
- Air Force Instruction 32-7042, *Solid and Hazardous Waste Compliance* (U.S. Air Force, 1994)
- *Travis AFB Hazardous Waste Management Plan* (Travis AFB, 2004a)
- *Travis AFB Environmental Flight Specifications* 01560 (Travis AFB, 2007)

Both alternatives would comply with these procedures. Compliance with waste management procedures would minimize potential impacts. The Proposed Action is not on or near any bulk fuel storage areas, and no impacts to bulk fuel storage areas are expected.

4.4.1 Alternative 1 – No Action

Under the No Action Alternative, current hazardous materials management practices, hazardous waste production, or waste management practices would not change; therefore; no impacts would occur.

4.4.2 Alternative 2 – Proposed Action

Any hazardous materials generated during demolition and construction will be handled in accordance with the *Hazardous Waste Management Plan* (Travis AFB, 2004a), which includes protocols for storing, labeling, and disposing of hazardous materials. With implementation of the Base waste management procedures, impacts resulting from use of hazardous materials and generation of hazardous waste during construction would be less than significant.

Prior to demolition and construction, the following measures would be implemented:

- Obtain a dig permit (60 AMW Form 55).
- Prepare a contingency plan in case soil discoloration or hydrocarbon vapors are detected or groundwater is encountered during demolition or construction. The contingency plan would be reviewed by the Base Remediation Program Manager (BRPM) before these activities are implemented.

If contaminated materials are encountered during demolition or construction, protective measures would be implemented based on direction from the BRPM, and potential impacts to human health and the environment from the contamination would be less than significant.

Operation of the perimeter fence would not involve activities that would use hazardous materials or generate hazardous waste. Therefore, no impacts are expected from operation of the Proposed Action.

4.5 Water Resources, Floodplains, and Wastewater

The alternatives would not use groundwater or release water in a way that could affect groundwater. The Proposed Action is not within the 100-year floodplain. No significant impacts to floodplains or groundwater are expected from the Proposed Action.

The Proposed Action is within Stormwater Drainage Area IV and outfalls at Location D (see Figure 3-1). Stormwater flows into the Duck Pond to the south of Georgetown MFH.

4.5.1 Alternative 1 – No Action

Under the No Action Alternative, the stormwater drainage system would not change within Georgetown MFH or on Travis AFB. The management of stormwater would not change on Travis AFB. Two sanitary sewer manholes would not be filled with concrete; therefore, sanitary sewer infrastructure would remain shared between Travis AFB and Georgetown MFH.

4.5.2 Alternative 2 – Proposed Action

4.5.2.1 Water Quality

Pollutants introduced to drainage ditches near the demolition and construction areas could affect the water quality of Union Creek. These activities could cause short-term impacts to drainages near the Proposed Action footprint. The Base has a stormwater permit (State Water Resources Control Board, 1992) and a stormwater pollution prevention plan. Stormwater discharge at the Base is regulated under the *Industrial Activities Storm Water Discharge Permit* (Travis AFB, 2002b). A construction stormwater pollution prevention plan (SWPPP) would also be prepared. An erosion control and restoration plan would be prepared to control short- and long-term erosion and sedimentation. Best management practices (BMP) to control runoff and sedimentation required by the construction SWPPP and the erosion control and restoration plan would include regular and documented site inspections, the use of silt fences, minimization of earth-moving activities during wet weather, and revegetation with native plant materials of disturbed areas. The Proposed Action would comply with restrictions in the stormwater permit, the construction SWPPP, and the erosion control and restoration plan. Compliance with the permit and implementation of BMPs would reduce potential impacts to water quality resulting from construction sediment discharged during storm events to Union Creek to less than significant levels.

4.5.2.2 Stormwater

Under the Proposed Action, approximately 250 cement footings that support the existing fence would be removed during demolition, and approximately 415 new cement footings would be installed during construction. Each footing is estimated to be approximately 1 square foot; therefore, approximately 165 square feet (less than 0.1 acre) of impermeable surface would be constructed. This amount is negligible; therefore, an increase in impermeable surface of 165 square feet as a result of implementing the Proposed Action is considered less than significant.

4.5.2.3 Wastewater

Under the Proposed Action, two sanitary sewer manholes would be filled with concrete, thereby disconnecting wastewater infrastructure from Georgetown MFH. Currently, residential housing within Georgetown MFH is unoccupied, and the Property Owner's plans for the property upon termination of the lease are unknown.

4.6 Biological Resources

This section analyzes the potential for adverse impacts to biological resources, such as habitat loss, from implementation of the No Action Alternative and the Proposed Action Alternative.

CH2M HILL prepared a biological assessment in January 2011 for the proposed project, and USFWS issued a Biological Opinion on May 27, 2011 (see Appendix D).

4.6.1 Alternative 1 – No Action

The No Action Alternative would not result in construction or other changes to the physical environment that could affect biological resources.

4.6.2 Alternative 2 – Proposed Action

The Proposed Action is within a developed part of Travis AFB, within managed and landscaped areas. Implementation of the Proposed Action would result in less-than-significant permanent or temporary direct or indirect impacts to biological resources, as discussed below.

4.6.2.1 California Tiger Salamander

The Proposed Action is within upland habitat for CTS. Demolition and construction activities would result in approximately 3.25 acres of temporary disturbance and approximately 0.061 acre of permanent disturbance to upland habitat. Permanent disturbances would result from the installation of fence posts and concrete footings. Several small mammal burrows were identified along the western part of the Proposed Action area that could be used as refugia for adult CTS. No significant impacts to CTS upland habitat are expected as a result of the proposed project.

The January 2011 Biological Assessment for this project indicated the grassland habitat in the project area would be considered CTS upland habitat because it is located within 1.3 miles of a known breeding pond. Formal consultation with the USFWS under the ESA regarding these expected impacts is complete, and a Biological Opinion (81420-2011-F-0436-1) was issued for the project on May 27, 2011.

The Biological Opinion and incidental take permit for the proposed action stipulates conditions to minimize adverse effects on CTS habitat. The Air Force is required to protect 0.183 acre of upland habitat by purchase of Central California tiger salamander compensation credits at an existing USFWS-approved bank or banks in Solano County, as appropriate for the species. The Air Force intends to purchase 0.183 acre of CTS upland habitat compensation credits at an existing USFWS-approved bank on the timeline set in the Biological Opinion.

4.6.2.2 Vernal Pool Crustaceans

While direct impacts to vernal pool habitat would be avoided, there is the potential for indirect impacts to vernal pools and other seasonal wetland habitat along the western side of the Proposed Action area during construction of the perimeter fence. With the use of best management practices, such as silt fencing, indirect impacts to vernal pool crustacean

habitat is expected to be less than significant. Installation and operation of the security fence are not expected to indirectly affect the hydrology of the wetlands or surrounding areas. The Biological Opinion and incidental take permit for the proposed action stipulates conditions to minimize adverse effects on vernal pool habitat. The Air Force will establish a minimum buffer of 53 feet around the vernal pool during construction per the requirements of the Biological Opinion.

4.6.2.3 Wetlands

The proposed security fence will be designed to avoid impacts to wetlands and waters including Union Creek, the vernal pools, and other seasonal wetlands in the western part of the Proposed Action area. At the creek location, the new fence would be installed on the north side of the gravel track, and a culvert grill would be installed on the 24-inch-diameter metal culvert at the creek crossing (see Figure 2-2). Installation of the perimeter fence and the culvert grill would not result in any fill material into Union Creek. Best management practices, such as straw wattles, silt fencing, and establishment of environmentally sensitive avoidance areas, would be used during construction of the perimeter fence to avoid indirect impacts to the vernal pool in the southwestern part of the Proposed Action area.

4.7 Socioeconomic Resources

The socioeconomic conditions of the region could be affected if implementation of either alternative resulted in changes in the rate of population growth, the demographic characteristics of the Base or Solano County, employment, or economic activity onbase or in the county. This section evaluates potential impacts to socioeconomic resources.

4.7.1 Alternative 1 – No Action

Under the No Action Alternative, construction would not occur; therefore, there would be no effect on socioeconomic resources onbase or in Solano County.

4.7.2 Alternative 2 – Proposed Action

The Proposed Action would have a short-term beneficial impact on socioeconomic resources because it would require a temporary increase in civilian contract employees (construction workers) at the Base during construction. Given the supply of construction labor in the region, construction workers would commute to the work site and would not require temporary housing. There would be minor, short-term economic benefits to local convenience businesses from construction workers purchasing meals, fuel, and other commodities near the Base. The impacts to socioeconomic conditions from temporary employment would be beneficial but minor compared with the Base or the county economy. The Proposed Action would result in short-term, beneficial impacts.

4.8 Cultural Resources

Several laws and regulations govern cultural resources management at Travis AFB, including the following (Travis AFB, 2003b):

- National Historic Preservation Act of 1966, as amended (16 USC 470)
- Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001 – 3013)
- Archaeological Resources Protection Act of 1979 (16 USC 470aa – 47011)
- *Cultural Resources Management* (Air Force Instruction 32-7065)
- Protection of Historic Properties (36 CFR 800)
- National Register of Historic Places (36 CFR 60, 61, 63, and 68)
- Native American Graves Protection and Repatriation Act (43 CFR 10)
- *Protection and Enhancement of the Cultural Environment* (EO 11593)
- *Accommodation of Sacred Sites* (EO 13007)
- *Consultation and Coordination with Indian Tribal Governments* (EO 13175)

The primary statutes requiring federal agencies to protect cultural resources are the National Historic Preservation Act, EO 11593, the Archaeological and Historic Preservation Act, and the Archaeological Resources Protection Act. The Cultural Resources Manager, under the supervision of the Asset Management Flight Chief, is responsible for managing natural and cultural resources at Travis AFB.

4.8.1 Alternative 1 – No Action

Under the No Action Alternative, construction would not occur. Therefore, under the No Action Alternative, cultural resources would not change.

4.8.2 Alternative 2 – Proposed Action

No known archeological sites, historic buildings, or other culturally sensitive areas exist in the Proposed Action area; therefore, no impacts to any of these are expected under the Proposed Action.

If cultural or archaeological resources are disturbed during construction, the impact would be considered significant. Therefore, prior to construction, a dig permit (60 AMW Form 55) would be acquired from 60 CES/CEO. A contingency plan would require the following:

- All activities would take place in compliance with the *Integrated Cultural Resources Management Plan* (Travis AFB, 2003b).
- If human remains or archaeological or cultural artifacts are discovered during construction, work would cease and the cultural resources manager would be contacted.

Adherence to the requirements of the dig permit and implementation of the contingency plan would reduce the potentially significant impacts to less than significant.

4.9 Land Use

This section discusses the potential effects to land use from the two alternatives. Land use at Travis AFB is described in the *General Plan for Travis Air Force Base, California* (Travis AFB, 2006).

4.9.1 Alternative 1 – No Action

Under the No Action Alternative, land use designations would not change at Travis AFB.

4.9.2 Alternative 2 – Proposed Action

The existing and future land use designation for the Proposed Action site is housing (family or accompanied), and the area directly south of the proposed fence line near the eastern sanitary sewer manhole is designated outdoor recreation (Travis AFB, 2006). No change in land use would be required under the Proposed Action; therefore, there would be no impact to land use.

The *Fairfield Train Station Specific Plan* (City of Fairfield, 2011) discusses future use of the area north of Georgetown MFH. Although the Georgetown MFH area is included; the plan states that any redevelopment of the site or change in use from military housing would require an amendment to the plan. The area directly north of Georgetown MFH is designated within the Specific Plan for future use as green belt or conservation (City of Fairfield, 2011).

Future land use at Georgetown MFH is currently unknown, but could result in the need for utility connections (water lines and sewer pipes). The nearest existing water line is located approximately 1 mile north of Georgetown MFH, and the nearest existing sewer pipeline is located along Peabody Road approximately 1.5 miles north-west of Georgetown MFH (City of Fairfield, 2011). The *Fairfield Train Station Specific Plan* shows a proposed sewer pipeline approximately 0.9 mile north of Georgetown MFH, along Vanden Road (City of Fairfield, 2011). Future land use at Georgetown MFH could potentially result in a need for utility access, therefore resulting in an unknown potential impact.

4.10 Transportation System

This section discusses the potential effects to the transportation system from the two alternatives.

4.10.1 Alternative 1 – No Action

Under the No Action Alternative, the use of the transportation system onbase and near the Base would not change. Current traffic levels and patterns on Travis AFB would continue.

4.10.2 Alternative 2 – Proposed Action

Two surface streets enter Georgetown MFH: Kuter Drive (from the south) on Travis AFB and Turner Drive (from the east), which connects to North Gate Road north of the Base. Currently, a security gate blocks Turner Drive (see Figure 2-1). The Proposed Action would construct a perimeter fence across Kuter Drive, severing access from Kuter Drive to

Georgetown MFH. After the property reverts back to the Property Owner, the Property Owner would likely open the Turner Road gate, allowing access to Georgetown MFH from North Gate Road.

Under the Proposed Action, larger construction vehicles would use Petersen Road and the South Gate on Travis AFB to access Georgetown MFH. Smaller construction vehicles, such as pickup trucks and sedans would use Air Base Parkway and the main gate or North Gate Road and the North Gate. The proposed perimeter fence construction area could also be accessed within Travis AFB from Kuter Drive. The sanitary sewer manhole east of Kuter Drive would be accessed from the gravel path that leads from the Duck Pond parking lot at Burgan Boulevard, connecting to Kuter Drive, and circling back to the Duck Pond. The water line isolation valve would be accessed via Valley View Way and the water tower yard. The roads north of Travis AFB are mostly used for access to Travis AFB and are not frequently traveled by the general public. Therefore, access by construction traffic from the north side of the Base would result in a less-than-significant impact to transportation systems.

Future land use at Georgetown MFH is currently unknown (see Section 4.10.2). The area directly north of Georgetown MFH is designated within the *Fairfield Train Station Specific Plan* for future use as green belt or conservation (City of Fairfield, 2011). Future land use at Georgetown MFH could potentially result an increase in traffic volume on North Gate Road, resulting in an unknown but potential impact.

4.11 Safety and Occupational Health

This section discusses the potential effects to safety and occupational health from the two alternatives.

4.11.1 Alternative 1 – No Action

Under the No Action Alternative, security at Travis AFB would be affected because the Georgetown MFH area is currently open to Travis AFB. After the lease expires, Georgetown MFH would be accessible to the public; therefore, the No Action Alternative would pose a security risk to Travis AFB.

4.11.2 Alternative 2 – Proposed Action

The Proposed Action would require demolition of the existing fence and construction of a perimeter fence, involving military and civilian personnel. Implementation of the Proposed Action would follow rules and regulations regarding safety and occupational health. A health and safety plan for construction would be prepared that would include requirements, such as securing construction areas to prevent unauthorized personnel from entering the work sites. In addition, workers would be provided with appropriate personal protective equipment including approved hard hats, safety shoes, gloves, goggles, eye/face protection, safety belts, harnesses, respirators, hearing protection, and traffic safety vests. With implementation of the health and safety plan, the potential for adverse impacts to safety and occupational health would be minor and limited to the duration of construction.

The Proposed Action would construct a perimeter fence securing the northeast corner of Travis AFB. Securing the perimeter of Travis AFB is considered a beneficial impact.

4.12 Airfield Operations

This section discusses the potential effects to airfield operations from the two alternatives.

4.12.1 Alternative 1 – No Action

Under the No Action Alternative, airfield operations would not change; therefore, no impacts would occur.

4.12.2 Alternative 2 – Proposed Action

The perimeter fence would be outside airspace and airfield operational areas. Neither construction of the perimeter fence nor disconnection of utilities would affect airspace or airfield operations; therefore, no impacts would occur.

4.13 Environmental Management

Environmental management includes geology, soils, and pollution prevention. This section discusses the potential effects to environmental management from the two alternatives.

4.13.1 Alternative 1 – No Action

Under the No Action Alternative, geology, soils, and pollution prevention activities would not change; therefore, no impacts would occur.

4.13.2 Alternative 2 – Proposed Action

Soil types in the area of the Proposed Action include Corning gravelly loam, Dibble-Los Osos loams, Millsap loam, and Antioch-San Ysidro complex (Travis AFB 2003a) (see Figure 4-2). Soils in the area of the water line isolation valve are primarily fill and previously disturbed from installation of underground water lines. A completed Travis AFB Form 124 and the soil analysis results shall be submitted to 60 CES/CEAN prior to reusing soil or transporting soil to any location other than the associated project site. No important soil resources are present in the area of the Proposed Action, and therefore, impacts to soils would be less than significant. The Proposed Action would not alter the geology of the area.

The Proposed Action would comply with the overall objectives of the pollution prevention program at Travis AFB. The Proposed Action would produce demolition and construction debris, and measures to prevent pollution would be implemented. To the extent possible, wastes generated during the demolition and construction activities would be removed from the site and recycled. If recycling is not possible or feasible, the waste will be disposed of in accordance with applicable regulations and policies. Generation and management of waste are expected to meet the pollution prevention goals in the P2MAP (Travis AFB, 2004c). Implementation of these measures would result in less-than-significant impacts to waste production and pollution prevention management.

4.14 Environmental Justice and Protection of Children

This section discusses the potential effects to minority populations, low-income populations, and children from the two alternatives.

4.14.1 Alternative 1 – No Action

The No Action Alternative would not affect minority populations, low-income populations, or children.

4.14.2 Alternative 2 – Proposed Action

No minority or low-income populations in the surrounding area would be affected by the construction of the Proposed Action; therefore, no impacts would occur.

Construction sites can be attractive to children and are dangerous, and the Proposed Action site is near an occupied family housing area. Georgetown MFH is currently accessible from Kuter Drive and along unfenced portions of the southern boundary. The construction site, equipment, and materials would be properly secured during construction. The Proposed Action site where the water line would be excavated and capped is fenced, and therefore, no impacts would occur to children in that location.

The Proposed Action would not generate appreciable additional traffic on Travis AFB; therefore, long-term adverse impacts are not expected. Hazardous wastes produced at the site during construction would be managed and disposed of in accordance with applicable regulations and the *Hazardous Waste Management Plan* (Travis AFB, 2004a) and would not pose a disproportionate risk to minority populations.

The Proposed Action would not affect minority populations, low-income populations, or children.

4.15 Indirect and Cumulative Effects

4.15.1 Indirect Effects

Indirect effects are defined by the CEQ in 40 CFR 1508.8 as those "which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." Indirect effects may include growth-inducing effects and other effects related to induced changes in land use patterns, population density, or growth rate. Indirect effects may also include growth-related effects on air, water, or other natural systems, including ecosystems.

Indirect effects of the Proposed Action have been addressed in the preceding resource-specific analyses. Implementing the Proposed Action is expected to result in less-than-significant indirect impacts to environmental resources. The alternative would not result in growth-inducing effects, induced changes in population, or related effects. Potential impacts to Base security would be beneficial.

4.15.2 Cumulative Effects

Cumulative effects are defined by the CEQ in 40 CFR 1508.7 as "impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions."

Projects considered for cumulative impacts in this EA are those that were recently completed, ongoing projects, or projects planned to begin within the next 2 years. Projects that are under consideration by the Base that would begin beyond 2 years were not evaluated. The following list (organized by year) includes recently completed or foreseeable future actions at Travis AFB:

- **Fiscal Year 2010**
  - Construct a large fire/crash station
  - KC-10 cargo load trainer
  - Repair Ramp Spot 515
  - C-17 Repair 300 Ramp PH11
  - C-5 Repair Ramp PH12
  - Replace bulk fuel transfer lines
  - 300 Ramp (pavement placed)
- **Fiscal Year 2011**
  - Runway 21L/ALZ
  - South Gate Project
  - Removal of rocks/curbing by two-bay
  - New fire station
  - Taxiway Lima Shoulder Project
  - 900 Ramp Shoulder Project
  - Fix sloping issue on Spots 601/602
  - Water line between Spots 601-603
  - Spot 302 (300 Ramp phase project)
- **Fiscal Year 2012**
  - Taxiway M Bypass Road

The potential for cumulative impacts to air quality would be from multiple projects constructed simultaneously. The potential impacts on air quality from construction are discussed in Sections 3.2 and 4.2. Not all of the projects listed above would be constructed simultaneously. The Proposed Action would conform to the SIP and not be regionally significant. After construction is complete, the Proposed Action would not contribute to long-term cumulative impacts to air quality because traffic would not increase.

Construction of the projects could result in unavoidable, permanent and temporary impacts to upland habitat for the federally listed CTS. These impacts require agency approval and implementation of permit requirements, including minimization measures to avoid adverse affects on this species. Permanent and temporary loss of CTS upland habitat would be

addressed through restoration of the site to pre-project conditions as well as through the purchase of credits at a USFWS-approved mitigation bank. The use of best management practices during construction and installation of the perimeter fence would minimize impacts to habitat for vernal pool crustaceans as well as other wetland habitats including Union Creek. No operational impacts to biological resources would result from the operation of the new perimeter fence. Travis AFB has either already obtained necessary permits authorizing construction or is in the process of applying for them. With implementation of permit requirements and associated mitigation requirements, the permanent impacts to biological resources would not be cumulatively significant.

4.16 Unavoidable Adverse Impacts

No significant unavoidable adverse impacts are expected from construction or operation of the Proposed Action. Any impacts resulting from construction are expected to be less than significant and short in duration.

4.17 Relationship between Short-term Uses and Enhancement of Long-term Productivity

The Proposed Action would meet the Base's need to secure the perimeter of Travis AFB after the lease expires for the Georgetown MFH area. Currently, the perimeter of Travis AFB includes the Georgetown MFH area. After the lease expires, the Georgetown MFH area would be returned to the Property Owner. The Proposed Action would enhance long-term productivity at Travis AFB by maintaining perimeter security at the Base.

4.18 Irreversible and Irretrievable Commitment of Resources

Under the Proposed Action, irreversible or irretrievable commitments of resources are not expected because operation of the perimeter fence would not require natural gas or electrical consumption.

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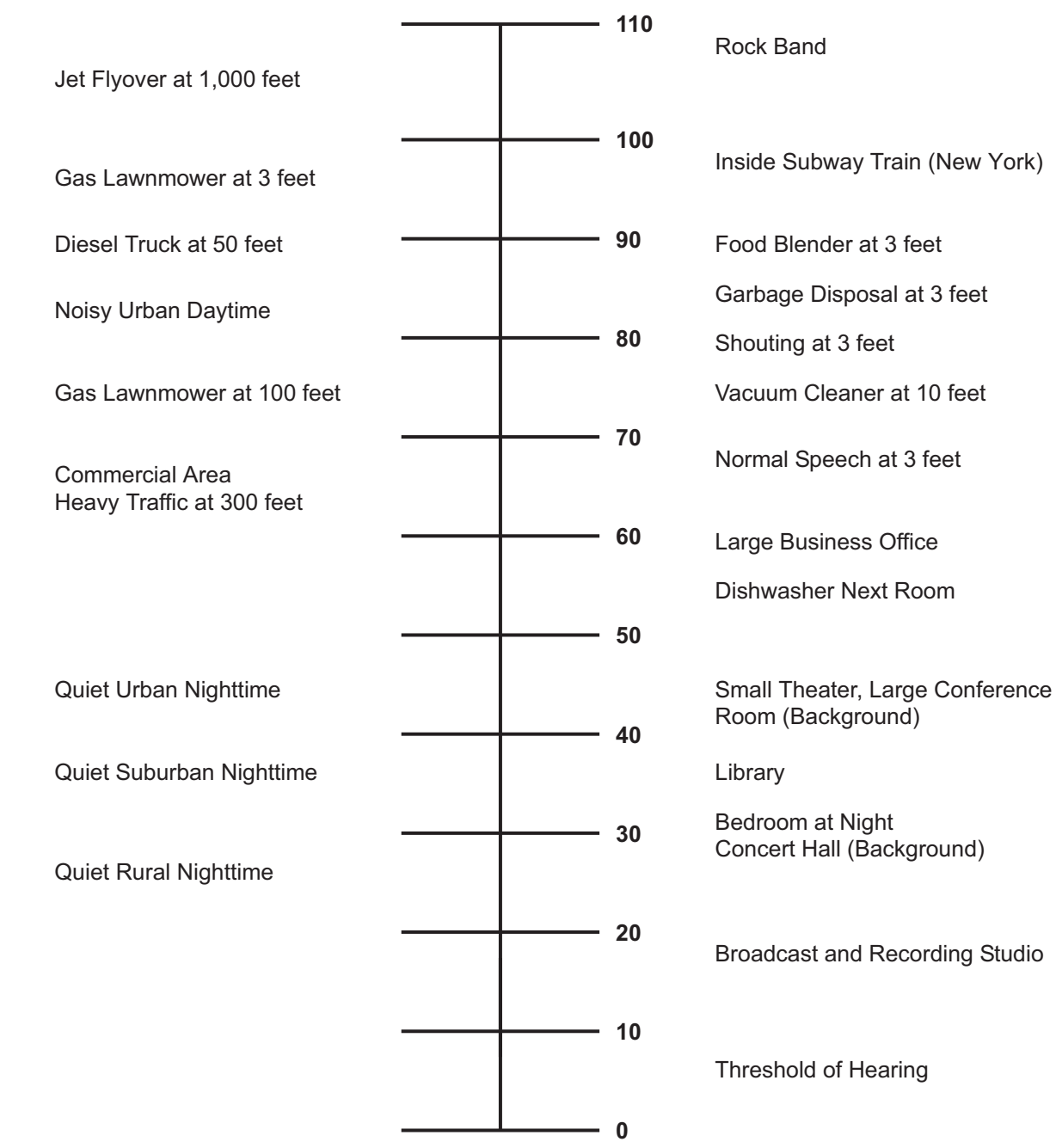

FIGURE 4-1
COMPARATIVE SOUND LEVELS
ENVIRONMENTAL ASSESSMENT TO CONSTRUCT A PERIMETER FENCE AT GEORGETOWN MILITARY FAMILY HOUSING, TRAVIS AIR FORCE BASE, CALIFORNIA

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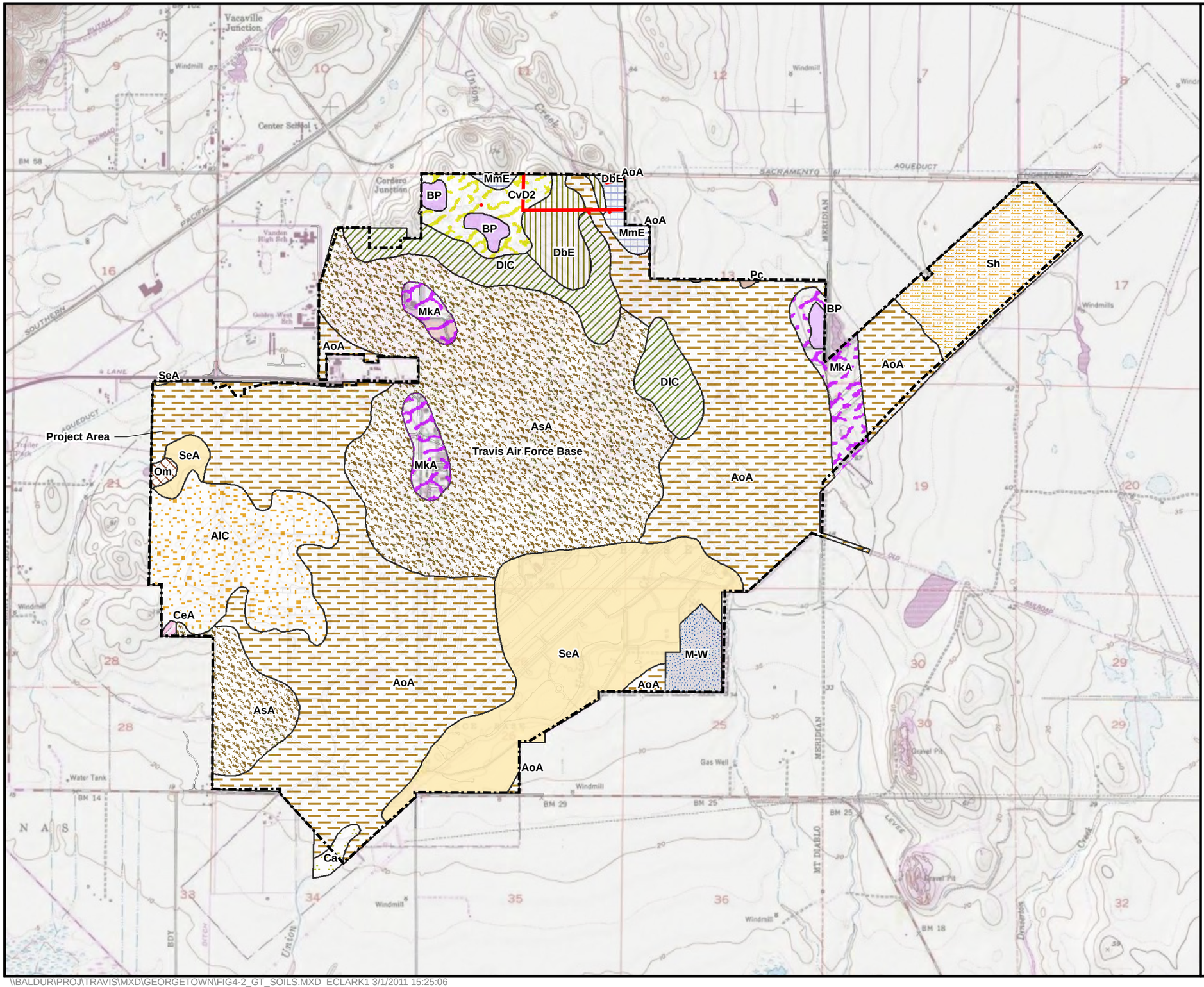

LEGEND

- PROPOSED ACTION FOOTPRINT
- BASE BOUNDARY
- AlC: Altamont-San Ysidro-San Benito complex
- AoA: Antioch-San Ysidro complex
- AsA: Antioch-San Ysidro complex, thick surface
- BP: Borrow pit
- Ca: Capay silty clay loam
- CeA: Clear Lake clay
- CvD2: Corning gravelly loam
- DbE: Dibble-Los Osos loams
- DIC: Dibble-Los Osos clay loams
- M-W: Miscellaneous water
- MkA: Millsap sandy loam
- MmE: Millsap loam
- Om: Omni clay loam
- Pc: Pescadero clay loam
- SeA: San Ysidro sandy loam
- Sh: Solano loam

N

0 2,500 FEET

FIGURE 4-2
SOIL TYPES
ENVIRONMENTAL ASSESSMENT TO CONSTRUCT A PERIMETER FENCE AT GEORGETOWN MILITARY FAMILY HOUSING, TRAVIS AIR FORCE BASE, CALIFORNIA

CH2MHILL

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SECTION 5

List of Preparers

TABLE 5-1
List of Preparers
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing
Travis Air Force Base, California

Name	Education	Experience	Role
Marjorie Eisert	B.S., Wildlife and Fisheries Biology	21 years	Project Manager
Karin Lilienbecker	M.S., Biology	17 years	Senior Consultant
Russell Huddleston	M.S., Ecology	11 years	Ecologist; Professional Wetland Scientist
Julie Petersen	B.S., Biology	8 years	Environmental Scientist
Hong Zhuang	M.S., Environmental Science and Engineering	9 years	Air Quality Engineer
Allison Wallen	B.A., Communications	26 years	Technical Publications Specialist

SECTION 6

List of Agencies and People Consulted and/or Provided Copies

The following people were consulted during preparation of this EA:

- David Musselwhite, 60 CES/CEA
- Chris Krettecos, 60 CES/CEAO
- Orlando Gardner, 60 CES/CEAOR
- Brian Sassaman, 60 CES/CEAN
- John Minker, 60 CES/CEOFE
- Richard Veiluva, 60 CES/CEP

Travis AFB coordinated distribution of this EA to the following public and regulatory agencies and libraries:

- **Federal**

U.S. Environmental Protection Agency, Region 9
Director, Officer of Federal Activities
75 Hawthorne Street
San Francisco, California 94105

U.S. Department of the Interior
U.S. Fish and Wildlife Service
California/Nevada Operations Office
2800 Cottage Way, Room W-2606
Sacramento, California 95825

U.S. Army Corps of Engineers
Attn: Jane Hicks
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San Francisco, California 94103-1398

- **U.S. Air Force**

Department of the Air Force, Air Mobility Command
Attn: Mr. Doug Allbright, HQ AMC/A7PI
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San Francisco, California 94105

- **State**

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California Department of Fish and Game
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Sacramento, California 94299-2090

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State of California Clearinghouse
Governor's Office
1400 Tenth Street
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Sacramento, California 95814

- **City**

City of Fairfield
Community Development Department
1000 Webster Street
Fairfield, California 94533
City of Vacaville

Community Development Department
650 Merchant Street
Vacaville, California 95688

Suisun City
Community Development Department
701 Civic Center Boulevard
Suisun, California 94588

- **Libraries**

Fairfield-Suisun Community Library
1150 Kentucky Avenue
Fairfield, California 94533

Suisun City Library
333 Sunset Avenue
Suisun City, California 94585

Mitchell Memorial Library
510 Travis Avenue (Building 436)
Travis Air Force Base, California 94535

Vacaville Public Library
1020 Ulatis Drive
Vacaville, California 95687

SECTION 7

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Appendix A
Air Force Form 813

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

Report Control Symbol RCS: 09-120

INSTRUCTIONS: *Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).*

SECTION I - PROPONENT INFORMATION

1. TO (Environmental Planning Function)	2. FROM (Proponent organization and functional address symbol)	2a. TELEPHONE NO.
60th CES/CEAO	60th CES/CEAC	424-1472

3. TITLE OF PROPOSED ACTION
Install Fence Between Georgetown Housing Area (801 Housing) and Travis AFB MFHs

4. PURPOSE AND NEED FOR ACTION *(Identify decision to be made and need date)*
The purpose and need is to fence off the Georgetown Housing Area to separate it from Travis AFB MFHs in preparation for the expiration of the lease in 2010.

5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES *(DOPAA) (Provide sufficient details for evaluation of the total action.)*
The proposed action is to install a new fence between the 801 Housing Area and Travis AFB MFHs. The only other alternative is not to install the fence.

6. PROPONENT APPROVAL (Name and Grade)	6a. SIGNATURE	6b. DATE
MSgt Calvin Baumann		20090929

SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. *(Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U= unknown effect)*	+	0	-	U
7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE *(Noise, accident potential, encroachment, etc.)*	☐	☐	☐	☐
8. AIR QUALITY *(Emissions, attainment status, state implementation plan, etc.)* Air conformity determination is not required IAW 40 CFR 93.253(c)(1).	☐	☐	☐	☐
9. WATER RESOURCES *(Quality, quantity, source, etc.)* see comments	☐	☐	☐	☐
10. SAFETY AND OCCUPATIONAL HEALTH *(Asbestos/radiation/chemical exposure, explosives safety quantity-distance, bird/wildlife aircraft hazard, etc.)*	☐	☐	☐	☐
11. HAZARDOUS MATERIALS/WASTE *(Use/storage/generation, solid waste, etc.)*	☐	☐	☐	☐
12. BIOLOGICAL RESOURCES *(Wetlands/floodplains, threatened or endangered species, etc.)* SEE COMMENT	☐	☐	☐	☐
13. CULTURAL RESOURCES *(Native American burial sites, archaeological, historical, etc.)*	☐	☐	☐	☐
14. GEOLOGY AND SOILS *(Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)*	☐	☐	☐	☐
15. SOCIOECONOMIC *(Employment/population projections, school and local fiscal impacts, etc.)*	☐	☐	☐	☐
16. OTHER *(Potential impacts not addressed above.)*	☐	☐	☐	☐

SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION

17. ☐ PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # _____ ; OR EA REQUIRED
☐ PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED.

18. REMARKS Needs further study because it is adjacent to cts breeding pools
#12 → ALSO CROSSES JURISDICTIONAL WATER WAY
ACCOMPLISH EA PER XDAT 10-7620 EA, INSTALL PERIMETER FENCE FOR GEORGETOWN

19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION (Name and Grade)	19a. SIGNATURE	19b. DATE
DAVID H. MUSSELWHITE, YC-02, DAF Chief, Asset Management Flight		20 OCT 09

60 CES/CEAN Water Program Checklist

Project Title Install fence between Georgetown & TAFB MFHs

XDAT _____ RCS 9-120 Reviewed by Chris Krettecos CK Date 10/16/05

[ ] Project qualifies as construction of 1 acre or more, or is part of a larger plan totaling 1 acre or more. Contractor must submit a Notice of Intent, SWPPP and fee to 60 CES/CEAN prior to construction (see attachments 1, 2 and 3) and complete and submit an Annual Site Compliance Report by July 1 of each year (See attachment 4).

[ ] Project qualifies as construction or ground disturbing activity of a sensitive nature, **less than 1 acre**. Contractor must complete Travis AFB Storm Water Pollution Prevention Plan for Construction Activities Under 1 Acre and submit to 60 CES/CEAN prior to construction. (attachment 1).

[ ] Project qualifies as maintenance or ground disturbing activity of a sensitive nature. Contractor must complete Travis AFB Storm Water Pollution Prevention Plan for Construction Activities Under 1 Acre and submit to 60 CES/CEAN prior to construction. (attachment 1).

[X] Construction and demolition debris must be managed and protected to prevent it from entering the storm sewer system or blowing or running off the site. Implement appropriate BMPs.

[X] Handle soil in a manner that will prevent it from entering storm drains, gutters or ditches where it will contaminate runoff during rain events. Implement appropriate BMPs.

[X] Uncontaminated water from excavations can be dewatered to nearby grass or soil in a manner that will not cause erosion. Contact 60 CES/CEA prior to dewatering to soil or grass to assure proposed discharge location does not threaten vernal pools or other environmentally sensitive areas. Do not discharge to storm drains, gutters or sanitary sewer.

[ ] High pressure water wash used to clean buildings of dirt and loose ***non-lead based paint*** should be kept out of storm drains. Channel flow to permeable area such as soil or grass. Control flow to prevent erosion. Flow may be channeled to large impervious areas with no drains to evaporate. Use filter rolls or filter fabric to filter paint chips and debris from flow. Collect waste and dispose of properly. Do not use high pressure wash to wash buildings containing lead based paint. Follow Travis AFB lead based paint management plan.

[X] Keep all paint products and wastes away storm drains, gutters and streets. Liquid residues from oil based paints, thinners, solvents, glues and cleaning fluids may be hazardous and must be disposed of properly.

[X] Fairfield-Suisun Sewer District regulates discharges to the sanitary sewer. Do not discharge storm water or wastewater generated from this activity to the sanitary sewer without approval from 60CES/CEA. Failure to obtain prior approval could result in a Notice of Violation being issued to Travis AFB.

[X] Cleanup after concrete, stucco and mortar work can cause storm water contamination. Uncured concrete, stucco and mortar should be returned to point of origin, or establish a permeable area away from drains, ditches, gutters and roadways to deposit until cured. When cured, remove and dispose properly. Return mixing equipment to point of origin for cleaning when possible. Otherwise, wash water and slurry should be dumped to a permeable area where it can be contained until dry. Hardened slurry should be removed and disposed of. Contact 60 CES/CEAN prior to dewatering to soil or grass to assure proposed discharge location does not threaten vernal pools or other environmentally sensitive areas.

[ ] Surface cleaning solutions, including rinse water, must be collected and disposed of properly. Grease, oil, trisodium phosphate, sodium hypochlorite and hydrochloric acid are not authorized storm water discharges and are not legal to discharge to the sanitary sewer.

[X] Saw-cut slurry is a contaminant. Vacuum up slurry or use sand/gravel bags to channel flow away from storm drain inlets to to a permeable area. Remove hardened slurry as soon as possible. Dispose of properly.

[ ] Other

_____

_____

_____

_____

ENGINEERING REVIEW COMMENTS

PAGE 1 OF 1 PAGES
DATE: 5 Oct 09

☐ CONCEPT DESIGN ☐ SERVICE CONTRACTS

☐ __ % DESIGN SUBMITTAL ☐ OTHER AF FORM 813

PROJECT DESCRIPTION
Install Fence Between Georgetown Housing Area and Trust Res MCHs

LOCATION

REVIEWED BY
Arvey Andrews

☐ ARCHITECTURAL ☐ ELECTRICAL ☐ CEO/OPERATIONS ☐ SABER

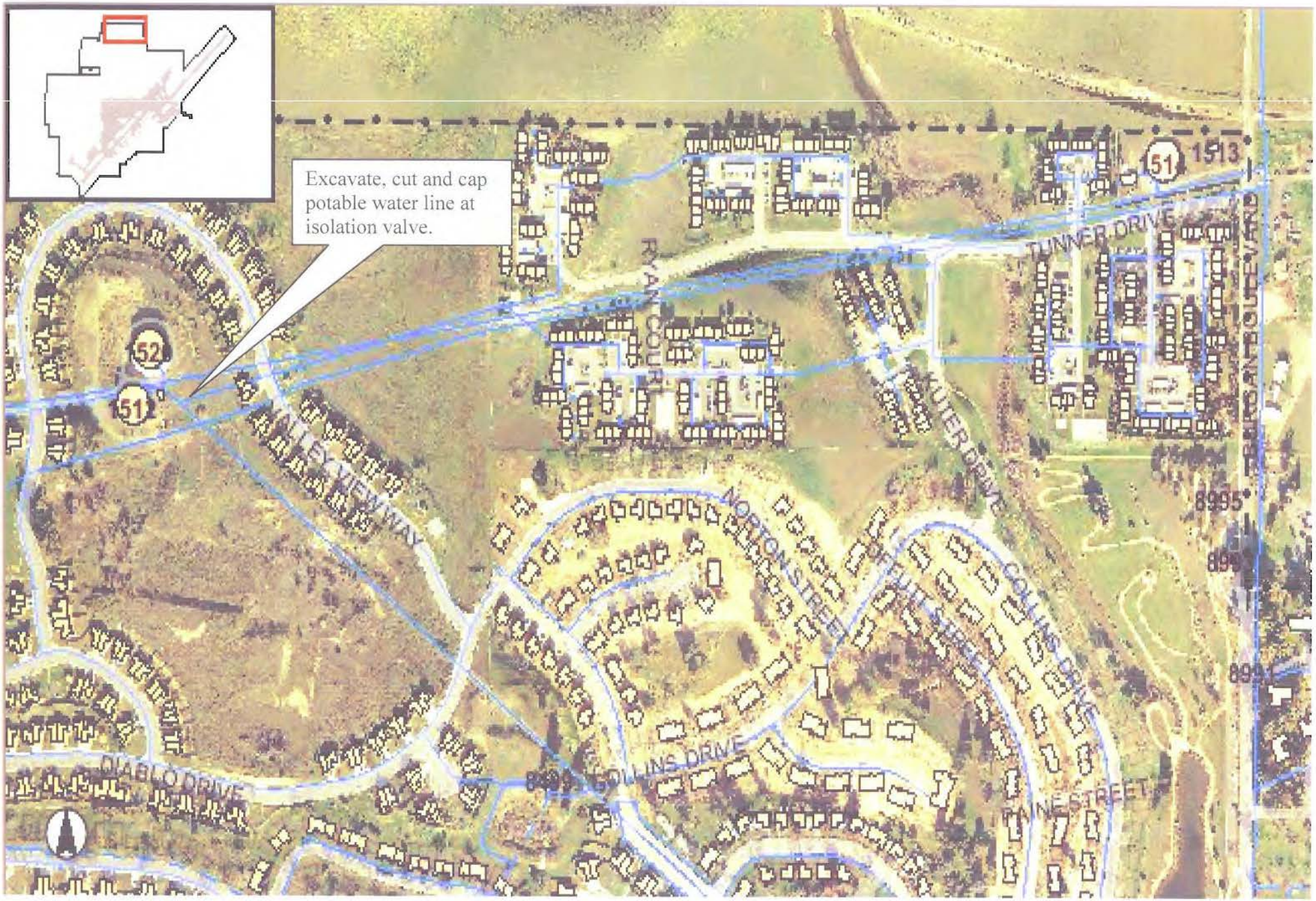
☐ CIVIL & STRUCTURAL ☐ PROGRAMMING ☐ CER ☐ OTHER

☐ MECHANICAL ☐ CONSTRUCTION MGT ☑ CEAN/ENVIRONMENTAL MGT

DRAWING NO. OR PARA NO.	ITEM NO.	COMMENTS	ACTION
		Please add the following:	
	1.	Contractor shall manage and characterize stockpiles in accordance with Section 01560, 3.9. Submit a completed TAFB Form 124 and analysis results to CEAN prior to reusing soil or transporting soil to another location.	
	2.	Ensure that all hazardous material is authorized, tracked, and managed in accordance with AFI 32-7086, AMC Supplement 1, 2.5.5.	

Sever George Town Sanitary Sewer Utility, Travis AFB

Sever George Town Potable Water Source, Travis AFB



Appendix B
Air Emission Calculations

APPENDIX B

Air Emission Calculations

B.1 Construction Equipment Emissions:

The construction equipment and vehicles emissions of nitrogen oxide (NO_x), sulfur dioxide (SO_2), particulate matter less than 10 micrometers in diameter (PM_{10}), particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$), carbon monoxide (CO), and volatile organic compounds (VOC) were estimated using emission factors in CARB's URBEMIS2007 model (CARB, 2007a) based on projected construction duration and estimated hours of construction equipment operations. Construction of the perimeter fence would take approximately 45 days in 2011. Default settings in URBEMIS2007 were used when project-specific data were not available. The following assumptions were used for the construction equipment:

- One tractor/loader/backhoe (108 horsepower [hp]) operating at 55% load for 8 hours/day.
- One post-hole auger (10 hp) operating at 73% load for 8 hours/day.
- Post-hole auger is assumed to have similar power rating and emissions as an industrial/concrete saw.
- Other construction equipment (190 hp) operating at 62% load for 8 hours/day.
- One water truck (189 hp) operating at 50% load for 8 hours/day.

Table B-1 summarizes the emissions from onsite construction equipment

TABLE B-1
Estimated Construction Equipment Emissions for Proposed Action
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing
Travis Air Force Base, California

	VOC (ton/yr)	CO (ton/yr)	NOx (ton/yr)	SO_2 (ton/yr)	PM_{10} (ton/yr)	$PM_{2.5}$ (ton/yr)	CO_2 (ton/yr)
Backhoe	0.0119	0.051	0.075	0.0001	0.0068	0.0068	7.38
Post hole auger	0.0015	0.005	0.009	0.0000	0.0004	0.0004	1.20
Other equipment	0.017	0.091	0.14	0.0002	0.0080	0.0080	16.49
Water truck	0.016	0.074	0.12	0.0002	0.0071	0.0071	12.16
Total	**0.05**	**0.22**	**0.34**	**0.0004**	**0.02**	**0.02**	**37.23**

Notes:

Emissions from construction equipment were estimated using URBEMIS2007 default hp and load factors. Equipment emission factors were obtained from Appendix I of URBEMIS2007 Users Guide (Jones & Stokes Associates, 2007). The emission factors corresponding to the hp rating closest to the proposed equipment were used in the calculation.

Post-hole auger used the emission factors for an industrial/concrete saw.

CO_2 = carbon dioxide

B.2 On-road Vehicle Emissions

Emissions associated with workers' commute and material delivery trucks were estimated based on estimated number of trips and vehicle miles traveled. Emission factors were obtained from EMFAC2007 (CARB, 2007b) for BAAQMD for 2011. The following assumptions were used in calculating vehicle emissions:

- Fifteen round trips per day for workers' commute. Round-trip distance for workers' commute is 40 miles.
- One round trip per day per truck during construction. To be conservative , all trucks used during construction were assumed to be heavy-duty diesel trucks.
- Diesel-truck round-trip distance is 40 miles.

The EMFAC2007 emission factors for passenger cars and heavy-duty diesel trucks were used to calculate workers' commute emissions and delivery truck emissions, respectively. The estimated vehicle exhaust emissions are shown in Table B-2.

TABLE B-2
Estimated Vehicle Emissions for Proposed Action
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing
Travis Air Force Base, California

	VOC (ton/year)	CO (ton/year)	NO_x (ton/year)	SO_2 (ton/year)	PM_{10} (ton/year)	$PM_{2.5}$ (ton/year)	CO_2 (ton/year)
Worker commute to site	0.0018	0.013	0.0482	0.00009	0.0017	0.0012	10.33
Cement trucks	0.0060	0.26	0.0083	0.00002	0.00007	0.0000	1.16
Delivery trucks	0.0060	0.26	0.0083	0.00002	0.00007	0.0000	1.16
Other vehicles	0.048	2.08	0.0665	0.00013	0.00054	0.0002	9.29
Total	**0.062**	**2.61**	**0.1313**	**0.00025**	**0.0024**	**0.0015**	**21.94**

Note:
Emission factors estimated using EMFAC2007 for BAAQMD for 2011.

B.3 Fugitive Dust Emissions

Fugitive dust emissions would be mostly due to vehicle travel on unpaved roads near the construction area. Project construction does not involve extensive grading or excavation; therefore, fugitive dust emissions related to off-road construction equipment operation during construction would be negligible.

Fugitive dust emissions from vehicle travel on unpaved roads were estimated using the equation in Appendix B of the URBEMIS2007 User's Guide (Jones & Stokes Associates, 2007).

$$EF = k\,(s/12)^{1.0}\,(S/30)^{0.5}\,)/\,(\,(M/0.5)^{0.2})$$

Where:

EF: PM_{10} emission factor, lb/vehicle mile traveled (VMT)

k = the fraction of particles less than or equal to the particle size cutoff of 10 microns
s = surface material silt content (%)
S = the average vehicle speed (mph)
M = surface moisture content (%)

URBEMIS default parameters used in the calculation and the estimated fugitive dust emission factors are shown in Table B-3:

TABLE B-3
Estimated Vehicle Fugitive Dust Emission Factor for Proposed Action
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing
Travis Air Force Base, California

	k	s	S	M	Emission factor (lb/VMT)
URBEMIS2007 Default	1.8	4.3	15	0.5	0.46

It was assumed that each vehicle would travel 2 miles per round trip on unpaved roads. Based on the number of vehicles used for construction and the number of round trips expected, the total miles traveled on unpaved road would be 180 miles during the construction period, resulting in 0.041 ton per year of fugitive dust emissions as PM_{10}. To be conservative, fugitive $PM_{2.5}$ emissions were assumed to be the same as the PM_{10} emissions.

B.4 Total Construction Emissions

Table B-4 presents the total of the construction emissions:

TABLE B-4
Summary of Construction Emissions - Total
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing
Travis Air Force Base, California

	Annual Emissions (ton/year)						
Emission Type	**VOC**	**CO**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
Construction Equipment	0.046	0.22	0.34	0.0004	0.022	0.022	37.2
On-road Vehicles	0.06	2.61	0.13	0.0002	0.0024	0.001	21.9
Fugitive Dust	NA	NA	NA	NA	0.041	0.041	NA
Total	**0.11**	**2.83**	**0.48**	**0.0007**	**0.066**	**0.065**	**59.2**

B.5 References

California Air Resources Board (CARB). 2007a. *URBEMIS 2007 for Windows, Version 9.2.* http://www.arb.ca.gov/planning/urbemis/urbemis2007/urbemis2007.htm. Accessed February 2011.

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Jones & Stokes Associates. 2007. URBEMIS2007 for Windows User's Guide.

Attachment B1
Construction Emission Calculations

ATTACHMENT B1
Construction Emission Calculations

1. Construction Emissions – Equipment

Emission Source	Number of Equipment	HP	Load Factor	Hours/day	Days	Emission Factors (g/hp/hr)							Emissions (ton/year)						
						ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Backhoe	1	108	0.55	8	45	0.504	2.170	3.198	0.004	0.289	0.289	312.846	0.0119	0.051	0.075	0.0001	0.0068	0.0068	7.38
Post Hole Auger	1	10	0.73	8	45	0.503	1.710	3.194	0.005	0.141	0.141	415.232	0.0015	0.005	0.009	0.0000	0.0004	0.0004	1.20
Other Equipment	1	190	0.62	8	45	0.360	1.950	3.064	0.004	0.171	0.171	352.663	0.017	0.091	0.14	0.0002	0.0080	0.0080	16.49
Water Truck	1	189	0.5	8	45	0.423	1.972	3.088	0.004	0.189	0.189	324.222	0.016	0.074	0.12	0.0002	0.0071	0.0071	12.16
Total													**0.05**	**0.22**	**0.34**	**0.0004**	**0.02**	**0.02**	**37.23**

Notes:

1. Emissions from construction equipment were estimated by using URBEMIS2007 default HP and load factors. Equipment emission factors were obtained from Appendix I of *URBEMIS2007 Users Guide* (Jones & Stokes Associates, 2007). The emission factors corresponding to the HP rating closest to the proposed equipment were used in the calculation.
2. Post hole auger used the emission factors for an industrial/concrete saw.
3. It was assumed the construction will be for 45 working days.

HP = horsepower
g/hp/hr = grams per horsepower per hour

2. Construction Emissions – Vehicles

Emission Source	Round Trip/Day	VMT/Round Trip	Operation Days	Vehicle Emission Factors (lb/mile)							Emissions (ton/year)						
				ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Worker Commute to Site	15	40	45	0.00014	0.001	0.004	0.00001	0.0001	0.00009	0.77	0.0018	0.013	0.0482	0.00009	0.0017	0.0012	10.33
Cement Trucks	1	40	45	0.007	0.288	0.009	0.00002	0.000	0.000	1.29	0.0060	0.26	0.0083	0.00002	0.00007	0.0000	1.16
Delivery Trucks	1	40	45	0.007	0.288	0.009	0.00002	0.000	0.000	1.29	0.0060	0.26	0.0083	0.00002	0.00007	0.0000	1.16
Other Vehicles	8	40	45	0.007	0.288	0.009	0.00002	0.000	0.000	1.29	0.048	2.08	0.0665	0.00013	0.00054	0.0002	9.29
Total											0.062	2.61	0.1313	0.00025	0.0024	0.0015	21.94

Notes:

1. Emission factors are from the EMFAC2007 v. 2.3 model for Bay Area Air Quality Management District for the year 2011. Vehicles are assumed to be traveling at 40 miles per hour.
2. Passenger vehicle emission factors were used for worker commute emissions. All other trucks were assumed to be heavy duty trucks to be conservative.

lb/mile = pound/mile
VMT = vehicle miles traveled

3. Vehicle Travel on Unpaved Surfaces
Emission Factor (URMEMIS default):
$EF^{(1)}$ = (k (s/12)^1.0 (S/30)^0.5)/ ((M/0.5)^0.2) lb/VMT

k	s	S	M	Emission factor (lb/VMT)
1.8	4.3	15	0.5	0.46

Notes:
1. Emission factors were calculated by using unpaved fugitive dust emission calculation equation and default parameters from Appendix C of the *URBEMIS2007 Users Guide* (Jones & Stokes , 2007).

k = the fraction of particles less than or equal to the particle size cutoff of 10 microns
s = surface material silt content (%)
S = the average vehicle speed (miles per hour)
M = surface moisture content (%)

Fugitive Dust Emissions

Miles on Unpaved Road	2	miles/round trip
Total Miles on Unpaved Road	180	miles/year
Fugitive Dust Emissions	0.041	ton/year

4. Summary of Construction Emissions

Emission Source	Emissions (ton/year)						
	ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Construction Equipment	0.046	0.22	0.34	0.0004	0.022	0.022	37.2
Onroad Vehicles	0.06	2.61	0.13	0.0002	0.0024	0.001	21.9
Fugitive Dust	NA	NA	NA	NA	0.041	0.041	NA
Total	0.11	2.83	0.48	0.0007	0.066	0.065	59.2

Note:
$PM_{2.5}$ emissions were assumed to be the same as PM_{10}, to be conservative.

Appendix C
Clean Air Act Conformity Applicability Analysis

APPENDIX C

Clean Air Act Conformity Applicability Analysis for Travis Air Force Base Perimeter Fence at Georgetown Military Family Housing

C.1 Purpose

The U.S. Air Force is required to perform a general conformity applicability analysis to determine whether the construction of the perimeter fence at Georgetown Military Family Housing at Travis Air Force Base (AFB), California, will comply with the U.S. Environmental Protection Agency (EPA) Final Conformity Rule, 40 Code of Federal Regulations (CFR) 93, Subpart B (for federal agencies), and 40 CFR 51, Subpart W (for state requirements) of the amended Clean Air Act (CAA).

C.2 Background

EPA has issued regulations addressing the applicability and procedures for ensuring that federal activities comply with the amended CAA. The EPA Final Conformity Rule implements Section 176(c) of the CAA, as amended in 42 United States Code (USC) 7506(c). This rule was published in the *Federal Register* on November 30, 1993, and took effect on January 31, 1994. In March 2010, EPA revised the Final Conformity Rule, which was published in the *Federal Registry* in April 2010. The revised rule, which took effect in July 2010, improves the process federal entities use to demonstrate that their actions will not contribute to a violation of a national air quality standard. The analysis presented in this appendix follows the revised rule, which requires comparison of project emissions to *de minimis* thresholds. The regional significance analysis is no longer required.

The EPA Final Conformity Rule requires federal agencies to ensure that a federal action resulting in nonattainment or maintenance criteria pollutant emissions conforms with an approved or promulgated state or federal implementation plan. Conformity means compliance with the purpose of attaining or maintaining National Ambient Air Quality Standards (NAAQS). Specifically, this means ensuring that the federal action will not: (1) cause a new violation of NAAQS, (2) increase the frequency or severity of existing violations of NAAQS, or (3) delay the timely attainment of NAAQS interim or other attainment milestones.

The EPA Final Conformity Rule applies only to federal actions in NAAQS nonattainment or maintenance areas.

C.3 Summary of Air Pollutant Emissions and Regulatory Standards

The Proposed Action would be implemented in Solano County, California, under the jurisdiction of the California Air Resources Board (CARB), the Bay Area Air Quality Management District (BAAQMD), and EPA Region 9. The area is designated as nonattainment (marginal) for 8-hour ozone (O_3) and particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$) for NAAQS. In addition, the urbanized areas of Solano County, which include the area occupied by Travis AFB, are designated as maintenance for carbon monoxide (CO) under the *2004 Revision to the California State implementation Plan for Carbon Monoxide, Updated Maintenance Plan for Ten Federal Planning Areas* (CARB, 2004). The county is in attainment of NAAQS for all other criteria pollutants.

The EPA Final Conformity Rule requires that total direct and indirect emissions of nonattainment and maintenance criteria pollutants, including O_3 precursors (volatile organic compounds [VOC] and nitrogen oxides [NO_x]), be considered in determining conformity. The rule does not apply to actions where total direct and indirect emissions of nonattainment and maintenance criteria pollutants do not exceed their thresholds established in 40 CFR 93.153(b). Tables C1 and C2 present the *de minimis* thresholds of nonattainment and maintenance areas, respectively. If a federal action meets *de minimis* requirements, detailed conformity analyses are not required pursuant to 40 CFR 93.153(c). The applicable *de minimis* thresholds for the Proposed Action are 100 tons per year (tpy) for emissions of O_3 precursors (VOC and NO_x), $PM_{2.5}$, sulfur dioxide (SO_2) (precursor of $PM_{2.5}$), and CO.

TABLE C-1
De Minimis Thresholds in Nonattainment Areas
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing, Travis Air Force Base, California – Clean Air Act Conformity Applicability Analysis

Pollutant	Degree of Nonattainment	*De Minimis* Threshold[a]
O_3 (VOC and NO_X)	Serious	50
	Severe	25
	Extreme	10
	Other ozone – outside an O_3 transport region	**100**
O_3 (VOC)	Marginal and moderate – inside an O_3 transport region:	50
O_3 (NO_X)	Marginal and moderate – inside an O_3 transport region:	100
CO	All	100
PM_{10}	Moderate	100
	Serious	70
$PM_{2.5}$	Direct emissions	**100**
	NO_x	**100**
	SO_2	**100**
	VOC or ammonia	100
SO_2 or NO_2	All	100
Lead	All	25

[a]*De minimis* thresholds are listed in tons per year. The bold numbers reflect *de minimis* thresholds used in this analysis.

Note:
NO_2 = nitrogen dioxide

Source: 40 CFR 93.153(b)

TABLE C-2
De Minimis Thresholds in Maintenance Areas
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing, Travis Air Force Base, California – Clean Air Act Conformity Applicability Analysis

Pollutant	Maintenance Area	*De Minimis* Threshold[a]
O_3 (NO_X)	All	100
O_3 (VOC)	Inside an O_3 transport region	50
	Outside an O_3 transport region	100
CO	All	**100**
PM_{10}	All	100
$PM_{2.5}$	Direct emissions	100
	NO_x	100
	SO_2	100
	VOC or ammonia	100
SO_2 or NO_2	All	100
Lead	All	25

[a]*De minimis* thresholds are listed in tons per year. The bold number reflects the *de minimis* threshold used in this analysis.

Note:
NO_2 = nitrogen dioxide
Source: 40 CFR 93.153(b)

C.4 Emission Calculations

C.4.1 Construction Emissions

Construction of the perimeter fence at Georgetown Military Family Housing would take approximately 45 working days from July 1, 2011, through August 14, 2011. The total construction footprint would be approximately 3 acres. Construction emissions are expected from engine exhaust from the additional vehicle trips by construction workers, delivery trucks, and offroad construction equipment. These emissions would primarily consist of CO, NO_x, PM_{10}, $PM_{2.5}$, SO_2, and VOC. In addition, vehicle travel on unpaved roads would result in fugitive dust emissions. The construction equipment and vehicles emissions were estimated using the default emission factors and equipment settings in URBEMIS2007 (CARB, 2007a), the projected construction duration, and estimated hours of construction equipment operations. Fugitive dust emissions from unpaved roads were estimated using the equation and default parameters in Appendix B of the URBEMIS2007 User's Guide (Jones & Stokes Associates, 2007).

Emissions associated with worker commutes were estimated by using the expected number of vehicle miles traveled by the workers. To be conservative, delivery trucks used for the construction were assumed to be heavy-duty trucks. Vehicle emission factors were calculated using EMFAC2007 (CARB, 2007b) for BAAQMD for 2011.

Table C-3 summarizes the emissions associated with the Proposed Action construction.

TABLE C-3
Summary of Construction Emissions for Proposed Action
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing,
Travis Air Force Base, California – Clean Air Act Conformity Applicability Analysis

	Annual Emissions (ton/year)				
Emission Type	**VOC**	**CO**	**NO_x**	**SO_2**	**$PM_{2.5}$**
Construction Equipment	0.046	0.22	0.34	0.0004	0.022
On-road Vehicles	0.062	2.61	0.13	0.0002	0.001
Fugitive Dust	NA	NA	NA	NA	0.041
Total	0.11	2.83	0.48	0.0007	0.065

C.4.2 Operation Emissions

No operation emissions are expected after the perimeter fences are constructed. Therefore**,** **operation** of the Proposed Action would not cause adverse air quality impacts, and no further analysis is required.

C.4.3 Emissions Summary and Comparison to *De Minimis* Levels

Table C-4 shows the annual emission increases associated with the Proposed Action and the comparisons with the *de minimis* thresholds. As shown, emissions of VOC, NO_x, $PM_{2.5}$, SO_2, and CO during construction of the project are well below their *de minimis* thresholds. On the basis of the conformity applicability criteria, the project conforms to the most recent EPA-approved state implementation plan (SIP); therefore, the project is exempt from the CAA conformity requirements and does not require a detailed conformity demonstration.

TABLE C-4
General Conformity Analysis for Proposed Action
Environmental Assessment to Construct a Perimeter Fence at Georgetown Military Family Housing,
Travis Air Force Base, California – Clean Air Act Conformity Applicability Analysis

Activity	**Annual Emission (tpy)**				
	VOC	**CO**	**NO_x**	**SO_2**	**$PM_{2.5}$**
Construction (2011)	0.11	2.83	0.48	0.0007	0.065
Operation (2011 and after)	0	0	0	0	0
De Minimis Threshold	100	100	100	100	100
Exceeds *De Mimimis* Threshold?	No	No	No	No	No

C.5 Works Cited

California Air Resources Board (CARB). 2004. *2004 Revision to the California State Implementation Plan for Carbon Monoxide, Updated Maintenance Plan for Ten Federal Planning Areas.*

92 California Air Resources Board (CARB). 2007a. *URBEMIS 2007 for Windows, Version 9.2*.
93 http://www.arb.ca.gov/planning/urbemis/urbemis2007/urbemis2007.htm. Accessed
94 February 2011.

95 California Air Resources Board (CARB). 2007b. *EMFAC2007 Release*.
96 http://www.arb.ca.gov/msei/onroad/latest_version.htm. Accessed February 2011.

97 Jones & Stokes Associates. 2007. URBEMIS2007 for Windows User's Guide.

Appendix D
Biological Opinion

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

IN REPLY REFER TO:
81420-2011-F-0436-1

MAY 27 2011

Mr. David H. Musselwhite
Department of the Air Force
60th Civil Engineer Squadron
411 Airmen Drive
Travis Air Force Base, California 94535

Subject: Biological Opinion for the Proposed Travis Air Force Base Georgetown Perimeter Fence Project, Solano County, California

Dear Mr. Musselwhite:

This letter is in response to your March 14, 2011, request for consultation on the proposed Travis Air Force Base (Travis AFB) Georgetown Perimeter Fence Project (proposed project), in Solano County, California. Your request included two components: (1) a request for formal consultation on the adverse effects of the proposed project on the federally-listed as threatened Central California distinct population segment (DPS) of the Central California tiger salamander (*Ambystoma californiense*) (Central California tiger salamander); (2) as well as a request for concurrence with your determination that the proposed project may affect but is not likely to adversely affect the federally-listed as threatened vernal pool fairy shrimp (*Branchinecta lynchi),* and endangered vernal pool tadpole shrimp (*Lepidurus packardi*) (collectively vernal pool crustaceans). The Service received your request on March 17, 2011.

Based upon the information provided, the Service concurs that the proposed project will adversely affect the Central California tiger salamander. Also, the Service concurs that the proposed project is not likely to adversely affect vernal pool crustaceans. There is one vernal pool located just outside of the action area, within 250-feet from the edge of construction. The vernal pool will be avoided and will have a minimum of a 53-foot buffer from the edge of construction. Travis AFB has also proposed the additional avoidance and conservation measures for vernal pool crustaceans. These measures are: (1) Best management practices (BMPs) will be implemented to control runoff and sedimentation, the use of silt fences, minimization of earth-moving activities, and revegetation of disturbed areas; (2) Exclusion fencing/high-visibility fencing will be installed around the vernal pool located on-site with a minimum buffer of 53-feet; (3) Project-related vehicle traffic will be restricted to established roads, construction areas, and other designated areas to minimize temporary disturbances; and (4) All work will be performed in the dry season.

The proposed project is not located in proposed or designated critical habitat for any federally-listed species. This response is in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act) and represents the Service's biological opinion on the effects of the proposed project on the Central California tiger salamander.

This biological opinion is based on information provided in the following: (1) the March 2011, *Biological Assessment, Georgetown Perimeter Fence, Travis Air Force Base, Solano County, California* (BA); (2) two meetings regarding the proposed project between the Service and Travis AFB personnel; (3) references cited in this biological opinion; and (4) other information available to the Service.

CONSULTATION HISTORY

August 5, 2010: The Service met with Travis AFB to discuss the proposed project and impending future Travis AFB project consultations. There was also a visit to the proposed project site.

February 22, 2011: The Service met with Travis AFB to discuss the proposed project and impending future Travis AFB project consultations.

March 17, 2011: The Service received a request for formal consultation from Air Force on the proposed project and the attached *Biological Assessment, Georgetown Perimeter Fence, Travis Air Force Base, Solano County, California*, (BA) prepared by CH2MHILL.

BIOLOGICAL OPINION

Description of Proposed Action

Travis AFB occupies approximately 6,883 acres of fee-owned land in northern California near the City of Fairfield in Solano County. Travis AFB is bordered on the east, north and south by agricultural land and open space and bordered on the west by mixed urban uses. Union Creek enters into Travis AFB near the northern boundary and is culverted until it exits Travis AFB near the southeast boundary. The proposed project area lies along the northern boundary of Travis AFB.

The Air Force and Air Mobility Command (AMC) at Travis AFB proposes to construct a perimeter security fence and disconnect shared utilities as part of the action to terminate the former Georgetown Military Family Housing (MFH) Lease. When the lease expires on August 14, 2011, Travis AFB will return possession of the Georgetown MFH area to the Hunt Building Corporation (property owner). Travis AFB entered into the lease agreement with the property owner on August 15, 1991, for the development and use of the Georgetown MFH areas for 20 years. The future use of the Georgetown MFH area by the property owner is unknown.

The Georgetown MFH area consists of approximately 53 acres within the northern portion of the 6,883 acre base property, and contains 300 housing units, roadway infrastructure, and utility connections. The housing units are unoccupied and Travis AFB does not intend to renew the lease with the property owner because sufficient housing is available at other locations on Travis AFB.

The Georgetown MFH area is currently fenced on the north, east, and west and partially fenced on the south. The water tower yard, which is located in the northeast corner of the Georgetown MFH area, is currently fenced along all sides. The current perimeter fencing on the west and south sides of both areas will be demolished. A new perimeter fence would be constructed along the south and west sides of the Georgetown MFH area, and along the south and west sides of the water tower yard; therefore, following termination of the lease, Travis AFB will require separate fencing around the base to remain secure. Since the south side of the Georgetown MFH area only has a partial fence, new fence will be installed where none had previously existed.

The proposed project includes the following actions:

- Demolish the existing chain-link fence and foundations on the west and south sides of Georgetown MFH and the west and south sides of the northeast water tower;
- Construct a perimeter fence on the west and south sides of Georgetown MFH and the west and south sides of the northeast water tower;
- Fill two sanitary sewer manholes with concrete; and
- Excavate, cut, and cap a potable water line

The total construction footprint would be approximately 3 acres, including unpaved areas that would be used as buffer areas during construction. Staging of equipment, supplies, and vehicles would occur on paved roads and other paved surfaces within the construction footprint.

Demolition of Existing Fence

Approximately 1,880 feet of chain-link fence on the west and south sides of Georgetown MFH and approximately 640 feet of chain-link fence on the west and south sides of the northeast water tower would be demolished (total of 2,520 feet of fence). A 30-foot-wide buffer area (15 feet on either side of the fence) would be established to accommodate personnel, vehicles, and equipment supporting demolition activities. The chain-link fence could be demolished concurrently with construction of the perimeter fence.

Construction of Perimeter Fence

Approximately 4,150 feet of perimeter fence would be constructed, which is more than will be demolished due to the new fence being constructed on the south side where it did not

previously exist. The perimeter fence area would be graded and certain areas excavated to place steel fence posts. The fence would connect to the existing perimeter fence to the north and east of Georgetown MFH on Travis AFB. The perimeter fence would follow the specifications listed below:

- The fence would have an approximate five-foot setback from the Georgetown MFH property boundary;
- The fence would consist of a nine-gauge two-inch mesh, would be 6 feet high, and would have an additional foot of three-strand barbed wire;
- Fence posts would be steel and would be installed at a minimum depth of 4 feet for the pull posts and a minimum depth of 3 feet for the line posts. Fence posts would be spaced 10 feet apart; and
- A steel grill would be installed over the 24-inch corrugated metal culvert at the Union Creek crossing on the south fence line of Georgetown MFH

Separation of Shared Utilities

Shared utilities include potable water (water lines) and wastewater (sewer pipes). A 20-foot-wide buffer area will be established around each of the shared utility locations where disconnection will occur to accommodate personnel, vehicles, and equipment. These areas are part of the action area but are not located in the Georgetown MFH area. Disconnecting potable water and wastewater utility infrastructure would include the following activities:

- Potable Water – Potable water enters Georgetown MFH from Travis AFB via an underground water line. The water line extends from a water tower approximately 1,000 feet to the west of Georgetown MFH. The water line would be separated by excavating, cutting, and capping the water line at the water line isolation valve. The water line isolation valve is inside a fenced water tower yard on Travis AFB; and
- Wastewater – Two underground sewer pipes transport wastewater from Georgetown MFH into Travis AFB. The sewer pipes are accessed on Travis AFB by manholes directly to the south of the proposed perimeter fence line. Both manholes would be filled with concrete, thus separating the shared sewer pipes from Travis AFB. The manhole farthest to the east would be accessed via the gravel jogging path (approximately 10 feet from the manhole)

There are no shared electrical cables, fuel pipelines, or stormwater system infrastructure between Travis AFB and Georgetown MFH. Travis AFB would contact Pacific Gas & Electric Company to turn off electrical power to Georgetown MFH before the lease expires. No further action is required regarding electrical cables, fuel pipelines, or the stormwater system under the proposed action.

Schedule, Personnel, and Equipment

Construction of the perimeter fence at Georgetown MFH would occur from approximately July 1, 2011, through August 14, 2011. Approximately 15 personnel, working 8 hours per day, would be needed during construction. Personnel and equipment would work within designated construction limits. Staging of equipment used during construction would occur on existing paved surfaces. Construction vehicles would stay within buffer areas for access to unpaved areas. Construction equipment would include the following:

- Cement truck (1);
- Backhoe loader (tractor or loader) (1);
- Water truck (1);
- Post hole auger (hand-held with drill) (1);
- Vehicles for worker transportation (8); and
- Equipment transport trucks (4)

Conservation and Minimization Measures

According to the BA and additional information provided to the Service, this action will be designed and constructed in the following way that will minimize effects on the Central California tiger salamander. The conservation measures proposed below are considered part of the proposed action evaluated by the Service in this biological opinion.

1. To minimize the adverse effects of the proposed project on the Central California tiger salamander, the Air Force will protect a combined total of 0.183 acres of upland (0.061 acre of impact compensated at a 3:1 ratio = 0.183 acre). This habitat compensation can be achieved by the purchase of Central California tiger salamander compensation credits at an existing Service approved conservation bank or banks, in Solano County;

2. The Air Force will use best management practices (BMPs) to control runoff and sedimentation and will include the use of silt fences, minimization of earth-moving activities and revegetation of disturbed areas;

3. Exclusion fencing/high-visibility fencing will be installed around the vernal pool located on-site with a minimum buffer of 53-feet;

4. Travis AFB will restrict project-related vehicle traffic to established roads, construction areas, and other designated areas to minimize temporary disturbances;

5. A biological monitor will be on-site to monitor construction activities that occur in Central California tiger salamander upland habitat to ensure the amount of habitat disturbed does not exceed what is proposed for the project and evaluated in this biological opinion. The biological monitor will contact the Service immediately if the amount of habitat proposed for disturbance is going to be exceeded.

6. All work will be performed in the dry season

Action Area

The action area is defined in 50 CFR §402.02 as, "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the Travis AFB Georgetown Perimeter Fence Project, the total action area would be approximately 3 acres, which includes the 30-foot-wide buffer area on each side of the fence and the 20-foot-wide buffer area around each shared utility location. The action area is located in the northern portion of the base property. The action area was determined based on the direct and indirect effects of the proposed action, including: the demolition of the chain-link fence and foundations on the west and south sides of Georgetown MFH and the west and south sides of the northeast water tower, the construction of the new perimeter fence on the west and south sides of Georgetown MFH and the west and south sides of the northeast water tower, the filling of two sanitary sewer manholes with concrete, and the excavating, cutting, and capping of the potable water line (which lie outside of the Georgetown MFH area).

Analytical Framework for the Jeopardy Analysis

Jeopardy Determination

In accordance with policy and regulation, the jeopardy analysis in this biological opinion relies on four components: (1) the *Status of the Species*, which evaluates the Central California tiger salamander's range-wide condition, the factors responsible for that condition, and their survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the Central California tiger salamander in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the Central California tiger salamander; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the Central California tiger salamander; and (4) the *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the Central California tiger salamander.

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

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the Central California tiger salamander and the role of the action area in the survival and recovery of the Central California tiger salamander as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Status of the Species

Central California DPS of the Tiger Salamander

On May 23, 2003, we proposed to list the Central California DPS of the tiger salamander as threatened. At that time, we also proposed reclassification of the Santa Barbara County DPS and Sonoma County DPS from endangered to threatened (68 FR 28647). In the same notice, we also proposed a special rule under section 4(d) of the Act to exempt take for routine ranching operations for the Central California DPS and, if reclassified to threatened, for the Santa Barbara and Sonoma County DPSs (68 FR 28668). On August 4, 2004, after determining that the listed the Central California population of the California DPS of the Central California tiger salamander was threatened (69 FR 47211), we determined that the Santa Barbara and Sonoma County populations were threatened as well, and reclassified the Central California tiger salamander as threatened throughout its range (69 FR 47212), removing the Santa Barbara and Sonoma County populations as separately listed DPSs (69 FR 47241). In this notice, we also finalized the special rule to exempt take for routine ranching operations for the Central California tiger salamander throughout its range (69 FR 47248).

On August 18, 2005, as a result of litigation of the August 4, 2004 final rule on the reclassification of the Central California tiger salamander DPSs (*Center for Biological Diversity et al.* v. *United States Fish and Wildlife Service et al.*, C 04-04324 WHA [N.D. Cal. 2005]), the District Court of Northern California sustained the portion of the 2004 rule pertaining to listing the Central California tiger salamander as threatened with a special rule, vacated the 2004 rule with regard to the Santa Barbara and Sonoma DPSs, and reinstated their prior listing as endangered. The List of Endangered and Threatened Wildlife in part 17, subchapter B of Chapter I, title 50 of the Code of Federal Regulations has not been amended to reflect the vacatures contained in this order, and continues to show the rangewide reclassification of the Central California tiger salamander (salamander[s]) as a threatened species with a special rule. We are currently in the process of correcting the CFR to reflect the current status of the species throughout its range.

Species Description

The Central California tiger salamander is a large, stocky, terrestrial salamander with a broad, rounded snout. Recorded adult measurements have been as much as 8.2 inches long (Petranka 1998; Stebbins 2003). Central California tiger salamanders exhibit sexual dimorphism (differences in body appearance based on gender) with males tending to be larger than females. The coloration of the adults generally consists of random white or yellowish markings against a black body. The markings tend to be more concentrated on the lateral sides of the body; whereas other salamander species tend to have brighter yellow spotting that is heaviest on the dorsal surface.

Distribution

The Central California tiger salamander is endemic to California and historically inhabited the low-elevation grassland and oak savanna plant communities of the Central Valley, adjacent

foothills, and Inner Coast Ranges (Jennings and Hayes 1994; Storer 1925; Shaffer *et al.* 1993). The species has been recorded from near sea level to approximately 3,900 feet in the Coast Ranges and to approximately 1,600 feet in the Sierra Nevada foothills (Shaffer and Trenham 2004). Along the Coast Ranges, the species occurred from the Santa Rosa area of Sonoma County, south to the vicinity of Buellton in Santa Barbara County. The historic distribution in the Central Valley and surrounding foothills included northern Yolo County southward to northwestern Kern County and northern Tulare County. Three distinct Central California tiger salamander populations are recognized and correspond to Santa Maria area within Santa Barbara County, the Santa Rosa Plain in Sonoma County, and vernal pool/grassland habitats throughout the Central Valley.

Life History

The Central California tiger salamander has an obligate biphasic life cycle (Shaffer *et al.* 2004). Although the larvae develop in the vernal pools and ponds in which they were born, the species is otherwise terrestrial and spend most of their post-metamorphic lives in widely dispersed underground retreats (Shaffer *et al.* 2004; Trenham *et al.* 2001). Because they spend most of their lives underground, the animals rarely are encountered even in areas where Central California tiger salamanders are abundant. Subadult and adult Central California tiger salamanders typically spend the dry summer and fall months in the burrows of small mammals, such as California ground squirrels (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*) (Storer 1925; Loredo and Van Vuren 1996; Petranka 1998; Trenham 1998a). Although ground squirrels have been known to eat these amphibians, the relationship with their burrowing hosts is primarily commensal (an association that benefits one member while the other is not affected) (Loredo *et al.* 1996; Semonsen 1998).

Central California tiger salamanders may also use landscape features such as leaf litter or desiccation cracks in the soil for upland refugia. Burrows often harbor camel crickets (*Stenelopomatus* species) and other invertebrates that provide likely prey for the amphibians. Underground refugia also provide protection from the sun and wind associated with the dry California climate that can cause excessive drying of amphibian skin. Although Central California tiger salamanders are members of a family of "burrowing" salamanders, they are not known to create their own burrows. This may be due to the hardness of soils in the California ecosystems in which they are found. Central California tiger salamanders depend on persistent small mammal activity to create, maintain, and sustain sufficient underground refugia for the species. Burrows are short lived without continued small mammal activity and typically collapse within approximately 18 months (Loredo *et al.* 1996).

Upland burrows inhabited by Central California tiger salamanders have often been referred to as aestivation-sites. However, "aestivation" implies a state of inactivity, while most evidence suggests that the animals remain active in their underground dwellings. One study has found that salamanders move, feed, and remain active in their burrows (Van Hattem 2004). Because the adults arrive at breeding ponds in good condition and are heavier when entering the pond than when leaving, researchers have long inferred that they are feeding while underground. A number of direct observations have confirmed this (Trenham 2001; Van Hattem 2004). Thus, "upland habitat" is a more accurate description of the terrestrial areas used by Central California tiger salamanders.

Central California tiger salamanders typically emerge from their underground refugia at night during the fall or winter rainy season (November-May) to migrate to their breeding ponds (Stebbins 1985, 1989; Shaffer *et al.* 1993; Trenham *et al.* 2000). The breeding period is closely associated with the rainfall patterns in any given year with less adults migrating and breeding in drought years (Loredo and Van Vuren 1996; Trenham *et al.* 2000). Male Central California tiger salamander are typically first to arrive and generally remain in the ponds longer than females. Results from a 7-year study in Monterey County suggested that males remained in the breeding ponds for an average of 44.7 days while females remained for an average of only 11.8 days (Trenham *et al.* 2000). Historically, breeding ponds were likely limited to vernal pools, but now include livestock stock ponds. Ideal breeding ponds are typically fishless, free of non-native predators, and seasonal or semi-permanent (Barry and Shaffer 1994; Petranka 1998).

While in the ponds, adult Central California tiger salamanders mate and then the females lay their eggs in the water (Twitty 1941; Shaffer *et al.* 1993; Petranka 1998). Egg laying typically reaches a peak in January (Loredo and Van Vuren 1996; Trenham *et al.* 2000). Females attach their eggs singly, or in rare circumstances, in groups of two to four, to twigs, grass stems, vegetation, or debris (Storer 1925; Twitty 1941). Eggs are often attached to objects, such as rocks and boards in ponds with no or limited vegetation (Jennings and Hayes 1994). Clutch sizes from a Monterey County study had an averaged of 814 eggs (Trenham *et al.* 2000). Seasonal pools may not exhibit sufficient depth, persistence, or other necessary parameters for adult breeding during times of drought (Barry and Shaffer 1994). After breeding and egg laying is complete, adults leave the pool and return to their upland refugia (Loredo *et al.* 1996; Trenham 1998a). Adult Central California tiger salamanders often continue to emerge nightly for approximately the next two weeks to feed amongst their upland habitat (Shaffer *et al.* 1993).

Central California tiger salamander larvae typically hatch within 10 to 24 days after eggs are laid (Storer 1925). The peak emergence of these metamorphs is typically between mid-June and mid-July (Loredo and Van Vuren 1996; Trenham *et al.* 2000). The larvae are totally aquatic and range in length from approximately 0.45 to 0.56 inches (Petranka 1998). They have yellowish gray bodies, broad fat heads, large, feathery external gills, and broad dorsal fins that extend well up their back. The larvae feed on zooplankton, small crustaceans, and aquatic insects for about six weeks after hatching, after which they switch to larger prey (J. Anderson 1968). Larger larvae have been known to consume the tadpoles of Pacific tree frogs (*Pseudacris regilla*), western spadefoot toads (*Spea hammondii*), and California red-legged frogs (*Rana draytonii*) (J. Anderson 1968; P. Anderson 1968). Central California tiger

salamander larvae are among the top aquatic predators in seasonal pool ecosystems. When not feeding, they often rest on the bottom in shallow water but are also found throughout the water column in deeper water. Young Central California tiger salamanders are wary and typically escape into vegetation at the bottom of the pool when approached by potential predators (Storer 1925).

The Central California tiger salamander larval stage is typically completed in 3 to 6 months with most metamorphs entering upland habitat during the summer (Petranka 1998). In order to be successful, the aquatic phase of this species' life history must correspond with the persistence of its seasonal aquatic habitat. Most seasonal ponds and pools dry up completely during the summer. Amphibian larvae must grow to a critical minimum body size before they can metamorphose (change into a different physical form) to the terrestrial stage (Wilbur and Collins 1973). Larval development and metamorphosis can vary and is often site-dependent. Larvae collected near Stockton in the Central Valley during April varied between 1.88 to 2.32 inches in length (Storer 1925). Feaver (1971) found that larvae metamorphosed and left breeding pools 60 to 94 days after eggs had been laid, with larvae developing faster in smaller, more rapidly drying pools. Longer ponding duration typically results in larger larvae and metamorphosed juveniles that are more likely to survive and reproduce (Pechmann *et al.* 1989; Semlitsch *et al.* 1988; Morey 1998; Trenham 1998b). Larvae will perish if a breeding pond dries before metamorphosis is complete (P. Anderson 1968; Feaver 1971). Pechmann *et al.* (1989) found a strong positive correlation between ponding duration and total number of metamorphosing juveniles in five salamander species. In Madera County, Feaver (1971) found that only 11 of 30 sampled pools supported larval salamanders, and 5 of these dried before metamorphosis could occur. Therefore, out of the original 30 pools, only 6 (20 percent) provided suitable conditions for successful reproduction that year. Size at metamorphosis is positively correlated with stored body fat and survival of juvenile amphibians, and negatively correlated with age at first reproduction (Semlitsch *et al.* 1988; Scott 1994; Morey 1998).

Following metamorphosis, juvenile Central California tiger salamanders leave their pools and move to upland habitat. This emigration can occur in both wet and dry conditions (Loredo and Van Vuren 1996; Loredo *et al.* 1996). Wet conditions are more favorable for upland travel but summer rain events seldom occur as metamorphosis is completed and ponds begin to dry. As a result, juveniles may be forced to leave their ponds on rainless nights. Under dry conditions, juveniles may be limited to seeking upland refugia in close proximity to their aquatic larval pool. These individuals often wait until the next winter's rains to move further into more suitable upland refugia. Juveniles remain active in their upland habitat, emerging from underground refugia during rainfall events to disperse or forage (Trenham and Shaffer 2005). Depending on location and other development factors, metamorphs will not return as adults to aquatic breeding habitat for 2 to 5 years (Loredo and Van Vuren 1996; Trenham *et al.* 2000).

Lifetime reproductive success for the Central California tiger salamander is low. Results from one study suggest that the average female bred 1.4 times over their lifespan and produced 8.5 young per reproductive effort that survived to metamorphosis (Trenham *et al.* 2000). This resulted in the output of roughly 11 metamorphic offspring over a breeding female's lifetime. The primary reason for low reproductive success may be that this relatively short-lived species requires two or more years to become sexually mature (Shaffer *et al.* 1993). Some individuals

may not breed until they are four to six years old. While Central California tiger salamanders may survive for more than ten years, many breed only once, and in one study, less than 5 percent of marked juveniles survived to become breeding adults (Trenham 1998b). With such low recruitment, isolated populations are susceptible to unusual, randomly occurring natural events as well human-caused factors that reduce breeding success and individual survival. Factors that repeatedly lower breeding success in isolated pools can quickly extirpate a population.

Dispersal and migration movements made by Central California tiger salamanders can be grouped into two main categories: (1) breeding migration; and (2) interpond dispersal. Breeding migration is the movement of salamanders to and from a pond from the surrounding upland habitat. After metamorphosis, juveniles move away from breeding ponds into the surrounding uplands, where they live continuously for several years. At a study in Monterey County, it was found that upon reaching sexual maturity, most individuals returned to their natal/ birth pond to breed, while 20 percent dispersed to other ponds (Trenham *et al.* 2001). After breeding, adult Central California tiger salamanders return to upland habitats, where they may live for one or more years before attempting to breed again (Trenham *et al.* 2000).

Central California tiger salamanders are known to travel long distances between breeding ponds and their upland refugia. Generally it is difficult to establish the maximum distances traveled by any species, but salamanders in Santa Barbara County have been recorded dispersing up to 1.3 miles from their breeding ponds (Sweet 1998). As a result of a 5-year capture and relocation study in Contra Costa County, Orlaf (2007) estimated that captured Central California tiger salamanders were traveling a minimum of 0.5 miles to the nearest breeding pond and that some individuals were likely traveling more than 1.3 miles to and from breeding ponds. Tiger salamanders are also known to travel between breeding ponds. One study found that 20 to 25 percent of the individuals captured at one pond were recaptured later at other ponds approximately 1,900 and 2,200 feet away (Trenham *et al.* 2001). In addition to traveling long distances during juvenile dispersal and adult migration, salamanders may reside in burrows far from their associated breeding ponds.

Although previously cited information indicates that Central California tiger salamanders can travel long distances, they typically remain close to their associated breeding ponds. A trapping study conducted in Solano County during the winter of 2002/2003 suggested that juveniles dispersed and used upland habitats further from breeding ponds than adults (Trenham and Shaffer 2005). More juvenile Central California tiger salamanders were captured at traps placed at 328, 656, and 1,312 feet from a breeding pond than at 164 feet. Approximately 20 percent of the captured juveniles were found at least 1,312 feet from the nearest breeding pond. The associated distribution curve suggested that 95 percent of juvenile Central California tiger salamanders were within 2,099 feet of the pond, with the remaining 5 percent being found at even greater distances. Preliminary results from the 2003-04 trapping efforts at the same study site detected juvenile Central California tiger salamanders at even further distances, with a large proportion of the captures at 2,297 feet from the breeding pond (Trenham *et al.*, unpublished data). Surprisingly, most juveniles captured, even those at 2,100 feet, were still moving away from ponds. In Santa Barbara County, juvenile Central California tiger salamanders have been trapped approximately 1,200 feet away while dispersing from their

natal pond (Science Applications International Corporation, unpublished data). These data show that many Central California tiger salamanders travel far while still in the juvenile stage. Post-breeding movements away from breeding ponds by adults appear to be much smaller. During post-breeding emigration from aquatic habitat, radio-equipped adult Central California tiger salamanders were tracked to burrows between 62 to 813 feet from their breeding ponds (Trenham 2001). These reduced movements may be due to adult Central California tiger salamanders exiting the ponds with depleted physical reserves, or drier weather conditions typically associated with the post-breeding upland migration period.

Central California tiger salamanders are also known to use several successive burrows at increasing distances from an associated breeding pond. Although previously cited studies provide information regarding linear movement from breeding ponds, upland habitat features appear to have some influence on movement. Trenham (2001) found that radio-tracked adults were more abundant in grasslands with scattered large oaks (*Quercus* species), than in more densely wooded areas. Based on radio-tracked adults, there is no indication that certain habitat types are favored as terrestrial movement corridors (Trenham 2001). In addition, captures of arriving adults and dispersing new metamorphs were evenly distributed around two ponds completely encircled by drift fences and pitfall traps. Thus, it appears that dispersal into the terrestrial habitat occurs randomly with respect to direction and habitat types.

Documented or potential Central California tiger salamanders predators include coyotes (*Canis latrans*), raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), opossums (*Didelphis virginiana*), egrets (*Egretta* species), great blue herons (*Ardea herodias*), crows (*Corvus brachyrhynchos*), ravens (*Corvus corax*), garter snakes (*Thamnophis* species), bullfrogs (*Rana catesbeiana*), California red-legged frogs (*Rana draytonii*), mosquito fish (*Gambusia affinis*), and crayfish (*Procrambus* species).

The Central Califomia tiger salamander is imperiled throughout its range due to a variety of human activities (Service 2004). Current factors associated with declining Central California tiger salamander populations include continued habitat loss and degradation due to agriculture and urbanization; hybridization with the non-native eastern salamander (*Ambystoma tigrinum*) (Fitzpatrick and Shaffer 2004; Riley *et al.* 2003); and predation by introduced species. Central California tiger salamander populations are likely threatened by multiple factors but continued habitat fragmentation and colonization of non-native salamanders may represent the most significant current threats. Habitat isolation and fragmentation within many watersheds have precluded dispersal between sub-populations and jeopardized the viability of metapopulations (broadly defined as multiple subpopulations that occasionally exchange individuals through dispersal, and are capable of colonizing or "rescuing" extinct habitat patches). Other threats include predation and competition from introduced exotic species; possible commercial over-utilization; diseases; various chemical contaminants; road kill; and certain mosquito and rodent control operations. Currently, these various primary and secondary threats are largely not being offset by existing Federal, State, or local regulatory mechanisms. The Central California tiger salamander is also prone to chance environmental or demographic events to which small populations are particularly vulnerable.

The global average temperature has risen by approximately 0.6 degrees Celsius during the 20th Century (IFPC 2001, 2007; Adger *et al* 2007). There is an international scientific consensus that most of the warming observed has been caused by human activities (IFPC 2001, 2007; Adger *et al.* 2007), and that it is "very likely" that it is largely due to manmade emissions of carbon dioxide and other greenhouse gases (Adger *et al.* 2007). Ongoing climate change (Anonymous 2007; Inkley *et al.* 2004; Adger *et al.* 2007; Kanter 2007) likely imperils the Central California tiger salamander, and the resources necessary for their survival. Since climate change threatens to disrupt annual weather patterns, it may result in a loss of their habitats and/or prey, and/or increased numbers of their predators, parasites, and diseases. Where populations are isolated, a changing climate may result in local extinction, with range shifts precluded by lack of habitat.

Travis AFB is located within the Solano-Colusa vernal pool region and the Greater Jepson Prairie Core area, which is defined by landscape and hydrological features that support a complex of vernal pools and a variety of associated endemic and special-status plant and animal species according to the Service's Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (Recovery Plan) (Service 2005a). Travis AFB also lies in the range of the Central California tiger salamander. The Central California tiger salamander has been adversely affected by development and modification of the vernal pool, grassland, and open woodland habitat within the Solano-Colusa vernal pool region. Construction of and around Travis AFB contributes to local Central California tiger salamander habitat loss and fragmentation. The Central California tiger salamander is known to be present in much of the undeveloped areas surrounding Travis AFB and has been documented breeding on Travis AFB. The California Department of Fish and Game's California Natural Diversity Database includes multiple reported Central California tiger salamander observations within 0.25 miles surrounding the project action area (CDFG 2011). Some of these observations include those at Wilcox Ranch property, Muzzy Conservation Bank, North Suisun Conservation Bank, Burke Ranch Conservation bank and one observation of breeding on Travis AFB in 2008.

Central California tiger salamander protocol level surveys have never been conducted on Travis AFB but CH2MHILL biologist, Mr. Russell Huddleston, incidentally captured Central California tiger salamander larvae while conducting vernal pool crustacean sampling at the Travis AFB Burke Property vernal pool mitigation site (Burke Property). The Burke property is on base near Travis AFB housing at the north central boundary of Travis AFB, less than 0.3 mile west of the action area (Service personal communication with Russell Huddleston on April 7, 2008). Mr. Huddleston informed the Service and Dr. Brad Shaffer from the University of California at Davis, and on April 3, 2008, Dr. Shaffer and his associates visited the Burke Property on Travis AFB to sample basin #BP35a and two other nearby pools on the Burke property for Central California tiger salamanders. According to Mr. Huddleston, Dr. Schaffer captured over 60 Central California tiger salamander larvae between two of the pools on the Burke property and took tissue samples from 20 individuals at each pool for genetic analysis. These captures were the first time Central California tiger salamanders had been identified on Travis AFB. This is more likely a result of a lack of survey data rather than the potential of the species to be present in appropriate habitat throughout Travis AFB. Further surveys in 2010 were conducted in pools on the Burke property which is near the action area. These surveys detected Central California tiger salamander larvae as well. The one vernal pool located

immediately adjacent to the action area was also identified in the BA to be suitable breeding habitat for Central California tiger salamanders but was not surveyed. This pool will be avoided.

Environmental Baseline

General biological resource surveys were conducted on November 17, 2010, February 2, 2011, and February 24, 2011. The site visits were performed to assess habitats suitable for listed species. These surveys indicated that the action area consists of annual grasslands with numerous small mammal burrows which are suitable upland habitat for the Central California tiger salamander. The action area is also immediately adjacent to pools which are either occupied habitat or suitable habitat for the Central California tiger salamander. The action area is also connected to undeveloped grasslands surrounding the Travis AFB which contains occupied habitat for the Central California tiger salamander.

The Service believes that the Central California tiger salamander is reasonably certain to occur within the action area because of the presence of appropriate upland habitat within the action area, the presence of breeding ponds adjacent to the action area, and known nearby occurrences within the dispersal range of the Central California tiger salamander. The Service also believes that the Central California tiger salamander is reasonably certain to occur within the action area because of uninterrupted connectivity between occupied habitat and the action area, and because of the biology and ecology of the animal, especially the ability of the adults to move considerable distances between their breeding ponds and upland habitat. The boundary of Travis AFB is defined by a tall chain link security fence that does not restrict Central California tiger salamander movement on or off Travis AFB, or the Georgetown MFH area.

Effects of the Action

Central California DPS of the Tiger Salamander

Cónstruction of the proposed project is likely to result in adverse effects to the Central California tiger salamander. The proposed project consists of (1) the demolition of the chain-link fence and foundations on the west and south sides of Georgetown MFH and the west and south sides of the northeast water tower; (2) the construction of the new perimeter fence on the west and south sides of Georgetown MFH which includes brand new fence where none previously existed; (3) the construction of the new perimeter fence on the west and south sides of the northeast water tower; and (4) the excavating, cutting, and capping of the potable water line.

The proposed project will grade, cut, excavate, and install permanent structures in upland grassland areas. Central California tiger salamanders are likely to be in the burrows within the action area. Ground disturbing activities will physically disturb the burrows and all Central California tiger salamanders within those burrows. Mortality or injury of individual Central California tiger salamanders is likely to occur from being crushed by project related equipment or vehicles during the grading, excavating or cutting within the action area. Individual Central California tiger salamanders are likely to be directly killed, unable to escape, be killed due to

desiccation, or entombment.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. There are no cumulative effects from non-Federal actions that are reasonably certain to occur within the action area at this time.

Conclusion

After reviewing the current status of the Central California tiger salamander, environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the Georgetown Perimeter Fence Project, as proposed, is likely to adversely affect this species, but is not likely to jeopardize its continued existence. The Service has determined that the project as proposed will not indirectly or directly reduce, appreciably, the likelihood of both the survival and recovery of the Central California tiger salamander in the wild.

Implementation of the project as proposed will incidentally take salamanders through grading, cutting, and excavating in upland grassland areas which will result in loss of individuals. Design measures in the project description will minimize effects to the Central California tiger salamander by avoiding breeding habitat, timing construction to occur in the dry season while Central California tiger salamander movement is restricted, and preserving approximately 0.183 acre of habitat for the Central California tiger salamander. Protecting the compensatory habitat in perpetuity and providing for long term management can be seen to provide minimization of the effect on species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Air Force so that they become binding conditions of any grant or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. The Air Force has a continuing duty to regulate the activity covered by this incidental take statement. If the Air Force; (1) fails to assume and implement the terms and conditions; or (2) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Air Force must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement.

Amount or Extent of Take

The Service expects that incidental take of Central California tiger salamanders may occur during this action. The extent of the take will be difficult to detect or quantify because their size and cryptic nature makes the finding of a dead specimen unlikely. Seasonal population fluctuations also may mask the ability to determine the exact extent of take.

Due to the difficulty in quantifying the number of Central California tiger salamanders that will be taken as a result of the proposed action, the Service is quantifying take incidental to the proposed project as the number of acres of upland (Central California tiger salamander habitat), that will be affected as a result of the action. Therefore, the Service estimates that the proposed action will result in the direct take of all Central California tiger salamanders inhabiting 0.061 acres of habitat. Anticipated take is expected to be in the form of mortality and injury due to construction related ground disturbance.

Effect of the Take

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the Central California tiger salamander in this biological opinion.

Reasonable and Prudent Measures

The following reasonable and prudent measure is necessary and appropriate to minimize the effects of the Travis AFB Georgetown Perimeter Fence Project on the Central California tiger salamander:

1. All conservation measures outlined in the project description, and as restated in this biological opinion must be fully implemented.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Air Force shall ensure they comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

The following Terms and Conditions implement Reasonable and Prudent Measure one (1):

1. The Air Force shall fully minimize the effect of take on the species caused by implementation of construction for the proposed project by securing compensatory habitat in the amounts and types as described in Conservation Measure one (1); and

2. The Air Force shall require as a condition of their permit for the proposed project that the contractor implement all of the conditions (conservation measures 2-6) and reporting requirements as described in this biological opinion

Reporting Requirements

The Service shall be notified within one (1) working day of the finding of any dead Central California tiger salamanders. Notification must include the date, time, and location of the incident or of the finding of a dead animal clearly indicated on a USGS 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information. The Service contacts are Division Chief, Endangered Species Program at the Sacramento Fish and Wildlife Office (916) 414-6600, and the Resident Agent-in-Charge of the Service's Law Enforcement Division (916) 414-6660. The Air Force must also contact CDFG immediately in the case of a dead or injured listed species. The CDFG contact for immediate assistance is State Dispatch at
(916) 445-0045.

Sightings of any Federal or state listed animal species should be reported to the CNDDB. A copy of the reporting form and a topographic map clearly marked with the location the animals were observed also should be provided to the Service.

CONSERVATION RECOMMENDATIONS

Section 7(a) (1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information or data bases. In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations. The Service recommends the following conservation actions:

1. The Air Force should incorporate culverts, tunnels, or bridges on roadways that allow safe passage by the Central California tiger salamander, other listed animals, and wildlife. The Air Force should include photographs, plans, and other appropriate information in their biological assessments if they incorporate "wildlife friendly" crossings into their projects;

2. The Air Force should conduct base-wide surveys to determine extent of occupied Central California tiger salamander aquatic and upland habitat; and

3. The Air Force should consider participating in the planning for a regional habitat conservation plan for listed and sensitive species

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the proposed Travis AFB Georgetown Perimeter Fence Project in Solano County, California. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

If you have questions, please contact Michelle Tovar, Senior Fish and Wildlife Biologist (Michelle_Tovar@fws.gov) or Kellie Berry, Chief, Sacramento Valley Branch of my office at (916) 414-6645.

Sincerely,

for Susan K. Moore
Field Supervisor

cc:
Jane M. Hicks, U.S. Army Corps of Engineers, San Francisco, California
Brenda Blinn, California Department of Fish and Game, Yountville, California

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