DRAFT

ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION OF A LIFT STATION

TRAVIS AIR FORCE BASE, CALIFORNIA

60th Air Mobility Wing
Department of the Air Force

November 2024

Privacy Advisory

This Draft Environmental Assessment (EA) is provided for public comment in accordance with the National Environmental Policy Act of 1969 (NEPA), the President's Council on Environmental Quality (CEQ), NEPA Regulations (40 Code of Federal Regulations [CFR] Parts 1500 to 1508), and 32 CFR Part 989, *Environmental Impact Analysis Process (EIAP)*. For this EA, the updated 20 May 2022 CEQ NEPA rules (87 Federal Register 23453 through 23470; pending congressional review) are being followed. The EIAP provides an opportunity for public input on Department of the Air Force (DAF) decision making, allows the public to offer input on alternative ways for the DAF to accomplish what it is proposing, and solicits comments on the DAF's analysis of environmental effects.

Public commenting allows Travis Air Force Base to make better, informed decisions. Letters and other written comments provided may be published in the EA. As required by law, comments provided will be addressed in the EA and made available to the public. Providing personal information is voluntary. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meetings or hearings. A copy of the EA can be found at http://www.travis.af.mil/About-Us/Environment and at the Fairfield Civic Center Library, Vacaville Public Library, Suisun City Library, and Mitchell Memorial Library. Only the names of individuals making substantive comments will be disclosed. Personal home addresses and phone numbers will not be published in the EA.

Compliance with Section 508 of the Rehabilitation Act

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Compliance with Revised CEQ Regulations

This document has been verified that it does not exceed 75 pages, not including appendices, as defined in 40 CFR § 1501.5(f). As defined in 40 CFR § 1508.1(v) a "page" means 500 words and does not include maps, diagrams, graphs, tables, and other means of graphically displaying quantitation or geospatial information.

DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI)

AND

DRAFT FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA)

CONSTRUCTION OF A LIFT STATION

TRAVIS AIR FORCE BASE, CALIFORNIA

Background

Pursuant to the National Environmental Policy Act (NEPA) of 1969 (42 United States Code § 4321 et seq.), the Council on Environmental Quality's (CEQ's) *Regulations for Implementing the Procedural Provisions of NEPA* (40 Code of Federal Regulations [CFR] Parts 1500-1508), and the Department of the Air Force's (DAF's) *Environmental Impact Analysis Process* (EIAP; 32 CFR Part 989), the DAF assessed the potential environmental consequences associated with the demolition of the old wastewater lift station and its proposed replacement with the construction of a new wastewater lift station on Travis Air Force Base (TAFB), Solano County, California. The Environmental Assessment (EA) for this proposal is incorporated by reference into this finding per 40 CFR 1508.13 and 40 CFR 1502.21.

The existing wastewater lift station (Building 1150) pumps approximately 80 percent of the sewage generated by TAFB. TAFB has a permit with the Fairfield-Suisun Sewer District (FSSD) to handle wastewater. The lift station moves wastewater from TAFB to the FSSD force main for treatment at the FSSD wastewater treatment plant. There is no operational wastewater treatment plant on TAFB; some wastewater treatment equipment from the original TAFB wastewater treatment plant (constructed in 1946) remains intact but is no longer functional or used. The existing lift station is responsible for removing wastewater from TAFB and directing that wastewater to the FSSD force main where it travels to the FSSD wastewater treatment plant. Constant maintenance is required to keep the current lift station operational. The current lift station has exceeded its life expectancy and will fail in the foreseeable future. The lift station's concrete vault has cracks and is crumbling around the pipe openings; pipes are severely corroded and have developed holes; the lift station pumps have reached the end of their life as one has completely failed; the electrical panels are outdated; and a monitoring device needs to be installed to monitor lift station flow rate, wastewater levels, pumps, and macerator. Failure of the lift station would require TAFB to reduce the use of potable water that would enter the wastewater stream from sinks and toilets and completely eliminate wastewater conveyance and disposal at the Base, impacting the mission.

The purpose of the Proposed Action is to continue to remove wastewater from TAFB. All wastewater generated by TAFB is treated by the FSSD. A fully functional and operational lift station is needed to ensure TAFB's wastewater is safely and effectively moved to the FSSD sanitary sewer system.

The EA, incorporated by reference into this finding, analyzes the potential environmental consequences of constructing a new lift station and demolishing the existing lift station. The EA provides environmental protection measures and best management practices (BMPs) to avoid or reduce adverse environmental impacts from those actions. The EA considers all potential impacts of Alternative 1 (Construct Replacement/New Lift Station) and the No Action Alternative. The EA also considers cumulative environmental impacts with other projects within the Region of Influence.

Six alternatives were identified as potentially meeting the purpose and need for the Proposed Action. However, through the screening of alternatives based on whether they met the requirements of selection standards, five of the alternatives for implementing the Proposed Action were eliminated from further analysis in the EA.

Alternative 1. Construct Replacement/New Lift Station

The 60th Air Mobility Wing would replace and construct a new lift station adjacent to the existing lift station, route the piping to the new lift station, then demolish the existing lift station. The new lift station, including a concrete pad, would have a permanent disturbance area of 5,490 square feet. The total temporary disturbance would be 26,300 square feet. Therefore, the total construction work area would be 31,790 square feet. Impacts would also occur from the rerouting of utilities, but those impacts would occur within the work site. A temporary backup generator would be installed at the new lift station.

It is anticipated that the construction of the new lift station and demolition of the existing lift station would be accomplished in two years or fewer. The demolition of the existing lift station would also remove the temporary backup generator currently installed at the lift station.

No Action Alternative

Under the No Action Alternative, TAFB would continue to utilize the existing lift station to transfer wastewater generated by the Base to the FSSD for wastewater treatment. The existing lift station would continue to degrade, and increased maintenance would be required to support the lift station's operation. One staff member from the 60th Civil Engineer Squadron would be required to complete daily checks of the lift station to confirm proper functionality. In the near future, likely in less than three years, the lift station will fail and there will be no way to remove and dispose of wastewater from TAFB.

Summary of Findings

Air Quality, Climate Change, and Greenhouse Gases. Emissions from the lift station construction and existing lift station demolition on TAFB would be temporary and minor. Estimated emission levels would be below the *de minimus* threshold levels. No operational emissions would occur because the temporary backup generator at the existing lift station would be removed and replaced with a temporary backup generate at the new lift station.

Water Resources. There would be short-term, minor, adverse impacts on water resources from soil disturbance during construction activities. Sediments from disturbed soils could be

transported into surface waters, such as the nearby ditch formally known as “Union Creek,” during stormwater events. With the Supreme Court’s decision in Sackett v. Environmental Protection Agency, 143 S. Ct. 1322 (2023), the conveyance ditch formerly known as Union Creek is no longer considered a water of the United States; thus the Clean Water Act (CWA) regulations no longer apply. Due to this ruling, all permits and requirements for this conveyance ditch that had a basis under the CWA no longer apply. Hazardous materials used during construction could impact surface and groundwater quality. However, BMPs implemented during and following construction activities would minimize these impacts.

Soils. The implementation of the Proposed Action would have short-term, negligible, adverse impacts on soils from construction activities. Soil disturbance could expose soils to increased erosion. There would be no changes in impermeable surface area following construction; therefore, there would be no long-term impacts on soils from stormwater-runoff-induced erosion. BMPs implemented during and immediately following construction would minimize these impacts.

Cultural Resources. No archaeological resources were identified during the Phase I intensive survey in the Area of Potential Effects. The implementation of the Proposed Action would not physically affect any National Register of Historic Places (NRHP)-eligible archaeological sites. There would be no effect on NRHP-eligible buildings. Concurrence from the State Historic Preservation Office with the no adverse effect determination was made on 27 August 2024.

Biological Resources. The implementation of the Proposed Action would have short-term, negligible, adverse impacts on vegetation and wildlife. The existing lift station structure would be surveyed for bats prior to demolition, and bats evicted if present. All active bird nests would be avoided through construction timing or implementation of preconstruction surveys for active nests. The Proposed Action would likely adversely affect the California tiger salamander (*Ambystoma californiense*), vernal pool fairy shrimp (*Branchinecta lynchi*), and vernal pool tadpole shrimp (*Lepidurus packardi*). Concurrence with these determinations by the US Fish and Wildlife Service has been requested by the DAF. Conservation measures enumerated in the Biological Assessment would be implemented and would ensure that federally listed species are protected, and injury averted to the extent possible.

Noise. Noise caused by Proposed Action would result in temporary, minor, adverse, impacts. At approximately 500 feet from the construction activities, the predicted maximum noise levels would drop below 65 A-weighted decibels. No sensitive noise receptors would be impacted.

Infrastructure. The Proposed Action would have short-term, negligible, adverse impacts on transportation and solid waste management, and long-term, beneficial impacts on wastewater management. Short-term utility interruptions could occur as utilities are removed from the old lift station and connected to the new lift station. There would be increased personal vehicles at TAFB gates from worker commutes and construction vehicles during the construction activities; those vehicle trips would cease when construction ends. The new lift station would reduce maintenance and extend the life and dependability of the TAFB wastewater conveyance and disposal system.

Health and Safety. The Proposed Action would have short-term, negligible, adverse impacts on health and safety, which are inherent to all construction and demolition activities. All construction personnel would be responsible for following federal and state safety regulations and Department of Defense and Occupational Safety and Health Administration safety standards and would be required to conduct construction activities in a manner that does not increase risk to workers, military personnel, or the public.

Hazardous Materials and Wastes, Environmental Restoration Program, and Toxic Substances. The implementation of the Proposed Action would have short-term, negligible, adverse impacts on hazardous materials and wastes as the quantity of hazardous materials used and hazardous waste generated would increase during construction. Impacts on Environmental Restoration Program Site OT0101, which overlaps the Proposed Action area, and Site FT005, which is proximate to the Proposed Action area, would not be expected as all contaminated soils and groundwater would be either avoided during demolition and construction activities, or a construction waiver would be obtained prior to the disturbance. The existing lift station would be surveyed for asbestos-containing materials, lead-based paint, and polychlorinated biphenyls, and those would be properly handled and disposed of if detected and encountered.

Socioeconomics. There would be a short-term, minor, beneficial impact from increased expenditures in the region during the lift station construction. These expenditures in the regional economy would end when the construction activities end.

Notice of Potential Wetlands and Floodplain Involvement

As required by Executive Order (EO) 11990, *Protection of Wetlands*; EO 11988, *Floodplain Management*, as amended by EO 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Inpu*t; and Air Force Manual 32-7003, *Environmental Conservation*, the DAF hereby provides notice of the potential for floodplain impacts. The existing lift station is located within the 100-year floodplain, and the replacement location for the new lift station would also be in the 100-year floodplain. As noted in the EA, there are no other practicable alternative locations for siting the new lift station. Further, there would be no substantial change in impermeable surface area within the 100-year floodplain after the new lift station is constructed because the existing lift station within the 100-year floodplain would be demolished. There would be no impacts on wetlands.

Stakeholder Input

Based on the description of the Proposed Action as set forth in the EA, all activities have been found to comply with the criteria or standards of environmental quality. Coordination with appropriate federal, state, and local agencies regarding this EA has been completed. The attached EA and this FONSI/FONPA are being made available to the public for a 30-day review period. Agency and public comments will be addressed as part of the analysis of potential environmental effects performed in the EA.

Conclusion

Finding of No Practicable Alternative. EO 11988 requires federal agencies to avoid, to the maximum extent possible, short- and long-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of development in a floodplain wherever there is a practicable alternative. If it is found that there is no practicable alternative, the agency must minimize potential harm to the floodplain and circulate a notice explaining why the action would be located in the floodplain prior to taking action.

The DAF published an Early Public Notice that the Proposed Action would occur in a floodplain in *The Vacaville Reporter*, *Daily Republic*, and *Tailwind* (at TAFB) on 25 and 26 February 2024. No comments were received in response to this notice.

The direct impacts from construction of a new lift station and demolition of the existing lift station within the 100-year floodplain would be unavoidable. There is no practicable alternative to replacing the existing lift station without encroaching on the 100-year floodplain. Further, there would be no change in the impermeable surface area in the 100-year floodplain with the demolition of the existing lift station following the construction of the new lift station.

Finding of No Significant Impact. After review of the EA prepared in accordance with the requirements of NEPA; CEQ regulations; and 32 CFR Part 989, EIAP, which are hereby incorporated by reference, I have determined that the proposed new lift station construction and existing lift station demolition composing the Proposed Action would not have a significant impact on the quality of the human or natural environment under any of the analyzed alternatives. Accordingly, an Environmental Impact Statement will not be prepared. This decision has been made after considering all submitted information, including a review of all public and agency comments received during the 30-day public comment period, and considering a full range of reasonable alternatives that meet project requirements and are within the legal authority of the DAF.

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DEREK M. SALMI, Brig Gen, USAF Date
Commander, 60th Air Mobility Wing

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Cover Sheet

Draft Environmental Assessment for Construction of a Lift Station

a. Responsible Agencies: Department of the Air Force; Travis Air Force Base (TAFB)

b. Cooperating Agency: None

c. Affected Location: TAFB, California

d. For Additional Information: Ms. Leslie Peña, Environmental Chief, 60th Civil Engineer Squadron, 411 Airmen Drive, TAFB, California 94535-2176; email: env.60ces@us.af.mil; or Public Affairs at (707) 424-2010

e. Report Designation: Draft Environmental Assessment (EA)

f. Abstract: This EA has been prepared pursuant to provisions of the National Environmental Policy Act, Title 42 United States Code §§ 4321 to 4347, implemented by the Council on Environmental Quality Regulations; Title 40, Code of Federal Regulations Parts 1500 to 1508; and 32 Code of Federal Regulations Part 989, *Environmental Impact Analysis Process.*

g. The purpose of the Proposed Action is to continue to remove wastewater from TAFB. A fully functional and operational lift station is needed to ensure TAFB's wastewater is safely and effectively moved to the Fairfield-Suisun Sewer District's (FSSD's) sanitary sewer system.

h. TAFB uses the FSSD to treat wastewater. The lift station, which pumps wastewater to FSSD, has leaks and performance issues. The lift station's concrete vault has cracks and is crumbling around the pipe openings; pipes are severely corroded and have developed holes; the lift station pumps have reached the end of their life expectancy; the electrical panels are outdated; and a monitoring device needs to be installed to monitor lift station flow rate, wastewater levels, pumps, and macerator. A failure of the lift station would reduce the use of potable water and elimination of wastewater at TAFB, impacting the mission. Failure of the lift station could result in a wastewater spill proximate to the nearby conveyance ditch, which supports sensitive species.
The Proposed Action includes the proposed construction of a new lift station to transfer wastewater from TAFB to the FSSD and a connection to the existing wastewater systems, as well as demolition of the existing lift station once the new lift station is complete.

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LIST OF ACRONYMS AND ABBREVIATIONS

60 AMW	60th Air Mobility Wing
60 CES/CEIE	60th Civil Engineer Squadron, Installation Management Flight, Environmental Management Element
°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
ACAM	Air Conformity Applicability Model
ACM	asbestos-containing material
AFB	Air Force Base
AFCEC/CZOW	Air Force Civil Engineer Center Installation Support Team
AFI	Air Force Instruction
AFMAN	Air Force Manual
APE	Area of Potential Effects
AST	aboveground storage tank
BA	Biological Assessment
BAAQMD	Bay Area Air Quality Management District
Basin	San Francisco Bay Area Air Basin
BCC	Bird of Conservation Concern
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal	California
Caltrans	California Department of Transportation
CARB	California Air Resources Board
C&D	construction and demolition
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CES	Civil Engineer Squadron
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2e	carbon dioxide equivalents

CRPR	California Rare Plant Rank
CWA	Clean Water Act
DAF	Department of the Air Force
dB	decibel
dBA	A-weighted decibel
DNL	day-night average sound level
DoD	Department of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESOHC	Environmental Safety and Occupational Health
FC	federal candidate species
FE	federal endangered species
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
FP	fully protected
FSSD	Fairfield-Suisun Sewer District
FT	federal threatened species
GHG	greenhouse gas
GSU	geographically separated unit
HAZMART	hazardous materials pharmacy
hr	hour
ICP	invertebrate of conservation priority
LBP	lead-based paint
L_{eq1H}	one-hour average sound level
MBTA	Migratory Bird Treaty Act
mgd	million gallons per day
mg/m^3	milligrams per cubic meter
NAAQS	National Ambient Air Quality Standards
Nat	national

NEPA	National Environmental Policy Act
NH_3	ammonia
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOA	Notice of Availability
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSR	New Source Review
O_3	ozone
OSHA	Occupational Safety and Health Administration
PAH	polynuclear aromatic hydrocarbon
Pb	lead
PBO	Programmatic Biological Opinion
PCB	polychlorinated biphenyl
PFAS	per- and polyfluoroalkyl substances
PFT	proposed federal threatened species
PG&E	Pacific Gas & Electric Company
$PM_{2.5}$	particulate matter less than 2.5 micrometers
PM_{10}	particulate matter less than 10 micrometers
POL	petroleum, oil, and lubricant
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
ROI	region of influence
ROCA	Record of Conformity Analysis
SCADA	Supervisory Control and Data Acquisition
SE	state endangered species
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SO_x	sulfur oxides
SSC	State Species of Special Concern
ST	state threatened

SWPPP	Stormwater Pollution Prevention Plan
TAFB	Travis Air Force Base
TPH	total petroleum hydrocarbon
tpy	tons per year
US	United States
UFC	Unified Facilities Criteria
USC	United States Code
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
UST	underground storage tank
VOC	volatile organic compound
WL	state watch list species

1.0 PURPOSE OF AND NEED FOR THE ACTION

1.1 Introduction

The 60th Air Mobility Wing (60 AMW) at Travis Air Force Base (TAFB) prepared this Environmental Assessment (EA) to evaluate the demolition of the old lift station and its proposed replacement with the construction of a new wastewater lift station on TAFB. This EA was prepared per the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] § 4321 et seq.), the Council on Environmental Quality's (CEQ's) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and the Department of the Air Force's (DAF's) *Environmental Impact Analysis Process* (EIAP; 32 CFR Part 989). This EA follows the updated 20 May 2022 CEQ NEPA rules (87 Federal Register 23453 through 23470; pending congressional review).

The 60 AMW is the largest air mobility organization in terms of personnel in the DAF with a versatile all-jet fleet of C-5M Super Galaxy and C-17 Globemaster III cargo aircraft and K-46 Pegasus refueling aircraft. As part of the Air Mobility Command, the 60 AMW is responsible for strategic airlift and air refueling missions circling the globe. The 60 AMW's primary roles are to provide rapid, reliable airlift of American fighting forces anywhere on earth in support of national objectives and to extend the reach of American and allied air power through mid-air refueling. The 60 AMW activity is primarily focused in the Pacific and Indian Ocean area, including Alaska and Antarctica. However, the 60 AMW crews can fly support missions anywhere in the world to fulfill its motto of being "America's First Choice" for providing true Global Reach.

As the host unit of TAFB, the 60 AMW handles more cargo and passengers than any other military air terminal in the United States. TAFB is the West Coast terminal for aeromedical evacuation aircraft returning sick or injured patients from the Pacific regions.

TAFB is located in Solano County, California, approximately 50 miles northeast of San Francisco, and 40 miles southwest of Sacramento (**Figure 1-1**). TAFB was established in 1942 and has hosted numerous missions and aircraft types. TAFB occupies 5,280 acres of land and 357 acres of geographically separated units (GSUs) and includes 394 buildings, excepting on-Base housing units.

The existing wastewater lift station (Building 1150) is located in the southeastern portion of TAFB, south and east of the airfield (**Figure 1-2**). The lift station pumps approximately 80 percent of the sewage generated by TAFB, which is approximately 0.9 million gallons per day. TAFB has a permit with the Fairfield-Suisun Sewer District (FSSD) to handle wastewater. The lift station moves wastewater from TAFB to the FSSD force main for treatment at the FSSD wastewater treatment plant. The current configuration of the lift station is less than 20 years old. However, the lift station was not designed as a new facility but is the product of modifying an older lift station. It is adjacent to a former wastewater treatment plant built in 1946 and was decommissioned more than 20 years ago.

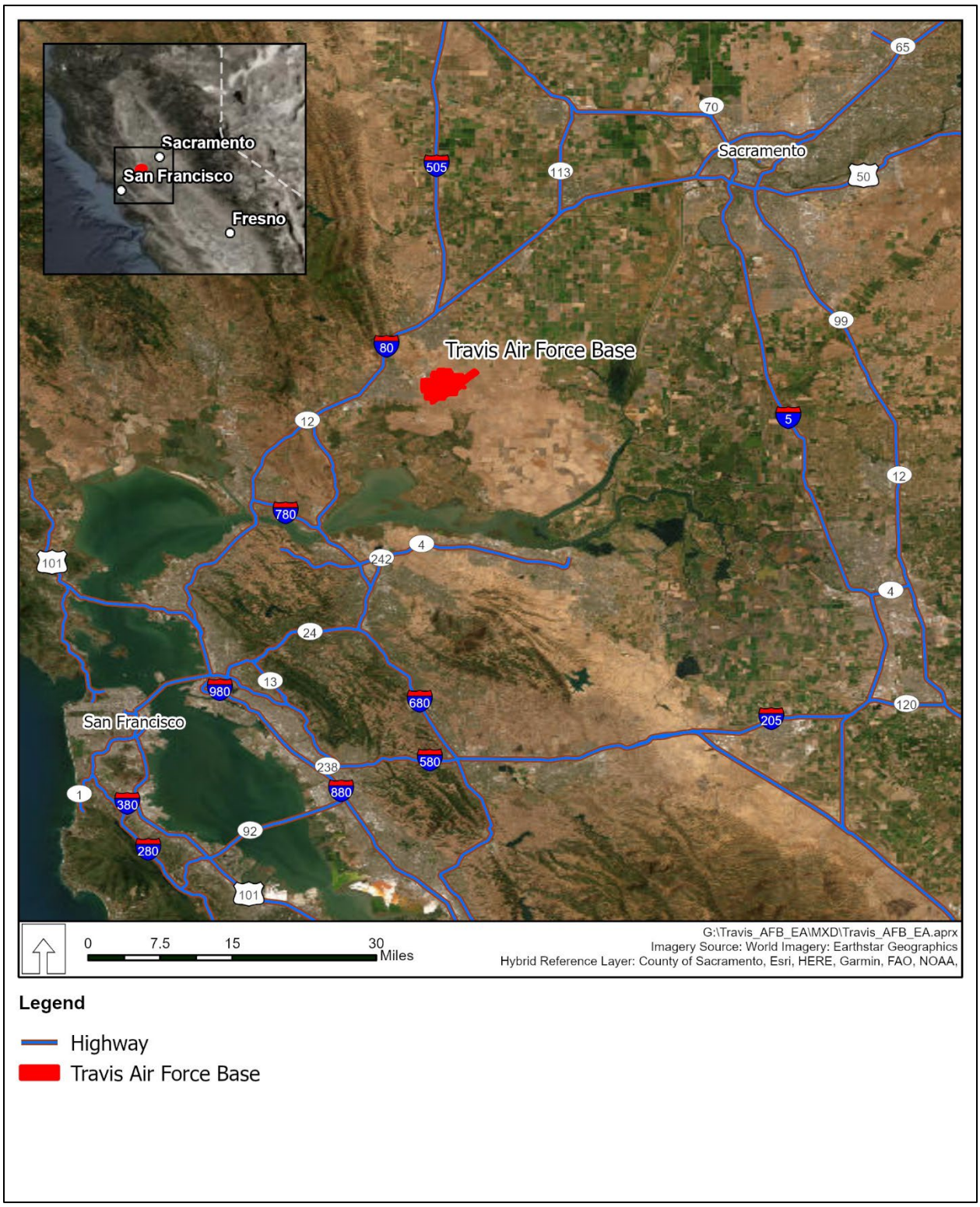

Figure 1-1. Location of Travis Air Force Base

Figure 1-2. Existing and Proposed New Wastewater Lift Station

The existing lift station has four pumps, a backup diesel generator, a macerator, a control panel, a concrete vault, connecting pipes, and a roof. Further, only three of the four pumps are working; there are wet-well concrete spalling (i.e., breaking into smaller pieces), plumbing leaks, and damage and leakage of the diversion box. The lift station's wet well is too small to accommodate peak flows during large rain events; therefore, an old wastewater treatment plant basin is used for the overflow until the peak flows recede. The single davit crane is inoperable. The pumps and comminutor (responsible for reduction of solid materials) are removed from the wet well using a truck-mounted crane. Also, the davit crane is not adjustable and may only be able to lift one of the two pumps next to the comminutor. The Supervisory Control and Data Acquisition (SCADA) and telemetry system that is supposed to continuously send current lift station data and alarms to a central location is currently not working. This forces the 60th Civil Engineer Squadron (CES) to send a staff member to visit the lift station daily to make sure it is working properly and that no alarms have sounded (TranSystems 2023). If the lift station fails, wastewater would back up to Building 1 on the opposite side of the airfield.

1.2 Purpose for the Action

The purpose of the Proposed Action is to continue to remove wastewater from TAFB. There is no operational wastewater treatment plant on the Base. All wastewater generated by TAFB is treated by the FSSD. The existing lift station is responsible for removing wastewater from TAFB and directing that wastewater to the FSSD force main where it travels to the FSSD wastewater treatment plant.

1.3 Need for the Action

Constant maintenance is required to keep the current lift station operational. The current lift station has exceeded its life expectancy and will fail in the foreseeable future. The lift station’s concrete vault has cracks and is crumbling around the pipe openings; pipes are severely corroded and have developed holes; the lift station pumps have reached the end of their life as one has completely failed; the electrical panels are outdated; and a monitoring device needs to be installed to monitor lift station flow rate, wastewater levels, pumps, and macerator. Failure of the lift station would require TAFB to reduce the use of potable water that would enter the wastewater stream from sinks and toilets and completely eliminate wastewater conveyance and disposal at the Base, impacting the mission. The lift station will fail and there will not be any means of removing wastewater from TAFB. Therefore, a fully functional and operational lift station is needed to ensure TAFB'S wastewater is safely and effectively moved to the FSSD sanitary sewer system.

1.4 Decision to Be Made

The EA evaluates whether the Proposed Action would result in significant impacts on the human or natural environment. Based on the analysis in this EA, the 60 AMW will make one of three decisions regarding the Proposed Action: 1) determine the potential environmental consequences associated with the Proposed Action or alternatives are not significant and sign a Finding of No Significant Impact (FONSI), 2) initiate preparation of an Environmental Impact Statement if it is determined that significant impacts would occur from the implementation of the

Proposed Action or alternatives, or 3) select the No Action Alternative, whereby the Proposed Action would not be implemented. As required by NEPA and its implementing regulations, preparation of an environmental document must precede final decisions regarding the proposed project and be available to inform decision-makers of the potential environmental impacts.

The Proposed Action would involve construction proximate to wetlands as defined in Executive Order (EO) 11990, *Protection of Wetlands*, and action in a floodplain under EO 11988, *Floodplain Management,* as amended by EO 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input*. A Finding of No Practicable Alternative (FONPA) is being prepared in conjunction with the FONSI. Final decisions regarding this EA will be made by 60 AMW, as described in 32 CFR Part 989, *EIAP*.

1.5 Interagency and Intergovernmental Coordination and Consultations

1.5.1 Interagency Coordination and Consultations

Scoping is an early and open process for developing the breadth of issues to be addressed in the EA and for identifying significant concerns related to a Proposed Action. Per the requirements of the Intergovernmental Cooperation Act of 1968 (42 USC § 4231[a]) and EO 12372, *Intergovernmental Review of Federal Programs*, as amended by EO 12416, federal, state, and local agencies with jurisdictions that could be affected by the Proposed Action were notified during the development of this EA.

Appendix A identifies the stakeholders consulted during this analysis and copies of correspondence.

1.5.2 Government-to-Government Consultations

Consistent with the National Historic Preservation Act's (NHPA's) implementing regulations (36 CFR Part 800), Department of Defense Instruction 4710.02, *DoD Interactions with Federally-Recognized Tribes*, DAF Instruction 90-2002, *Air Force Interactions with Federally-Recognized Tribes*, and Air Force Manual 32-7003, *Environmental Conservation*, the 60 AMW is also consulting with federally recognized tribes that are historically affiliated with the geographic region being considered for the Proposed Action regarding the potential to affect properties of cultural, historical, or religious significance to the tribes. The tribal coordination process is distinct from NEPA consultation or the intergovernmental coordination processes and requires separate notification of all relevant tribes. The timelines for tribal consultation are also distinct from those of intergovernmental consultations. The TAFB point of contact for Native American tribes is the Installation Tribal Liaison Officer first, then the Installation Commander.

Appendix A identifies the Native American tribal government agencies TAFB consulted with during this analysis and provides copies of correspondence.

1.5.3 Other Agency Consultations

Compliance with Section 7 of the Endangered Species Act (ESA) and Section 106 of the NHPA is conducted through coordination and consultation with the US Fish and Wildlife Service (USFWS) and the California State Historic Preservation Office (SHPO), respectively. Consultation letters and responses are included in **Appendix A.**

1.6 Public and Agency Review of EA

Because the Proposed Action would involve construction in a floodplain, it is subject to the requirements and objectives of EO 11988, *Floodplain Management*. Therefore, the 60 AMW published an early notice that the Proposed Action would occur in a floodplain in *The Vacaville Reporter*, *Daily Republic*, and *Tailwind* (at TAFB) on 25 and 26 February 2024. The early notice solicited public comments on the Proposed Action and practicable alternatives. No public comments were received in response to the early public notice.

A Notice of Availability (NOA) of the Draft EA and proposed FONSI was published in the newspapers of record (*The Vacaville Reporter*, *Daily Republic*, and *Tailwind*), announcing the availability of the Draft EA for review. Publication of the NOA invited the public to review and comment on the Draft EA and initiated a 30-day public and agency review period. At the close of the review period, substantive comments will be incorporated into the analysis of potential environmental impacts performed as part of the EA, where applicable. Once the Final EA has been approved and the EA process concluded, a NOA of the signed FONSI and FONPA (if applicable) will be published in the newspapers of record and online.

The Draft EA and FONSI/FONPA were made available online for review for 30 days from the date of publication of the NOA at https://www.travis.af.mil/Information/Environment/Document-Library/ and in hard copies at the following locations:

Fairfield Civic Center Library
1150 Kentucky Street
Fairfield, California 94533

Vacaville Public Library
1020 Ulatis Drive
Vacaville, California 95688

Suisun City Library
601 Pintail Drive
Suisun City, California 94585

Mitchell Memorial Library
510 Travis Boulevard
TAFB, California 94535

1.7 Scope of This Environmental Analysis

This EA, prepared in accordance with NEPA, analyzes the potential environmental consequences associated with the proposed construction of a replacement/new wastewater lift station at TAFB. NEPA ensures that environmental information, including the potential environmental consequences of a proposed action, is available to the public, federal. and state agencies and to the decision maker before decisions are made and actions are taken.

While the components of the Proposed Action are conceptual in design, the Proposed Action would implement the construction of a new lift station and subsequent demolition of the existing lift station at the locations shown in **Figure 1-2.** The EA will guide the 60 AMW in implementing the proposed project in a manner that is consistent with DAF standards for environmental stewardship.

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2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The Proposed Action is to replace the existing wastewater lift station in a manner that ensures the continued and proper treatment of TAFB wastewater. As the continuous treatment of wastewater is essential to mission functions at TAFB, any loss of wastewater treatment function could make the use of potable water and disposal of wastewater impossible. The implementation of the Proposed Action would be a seamless transition from the existing wastewater lift station to its replacement.

2.2 Selection Standards for Project Alternatives

The NEPA and the CEQ regulations mandate the consideration of reasonable alternatives for the Proposed Action. "Reasonable alternatives" are those that could be utilized to meet the purpose of and need for the Proposed Action. Per the DAF EIAP regulations (32 CFR Part 989), selection standards are used to identify alternatives that meet the purpose of and need for the Proposed Action. Selection standards enable the 60 AMW to critically evaluate whether all reasonable alternatives are included in the analysis. The following selection standards were applied to all the Proposed Action alternatives:

A) **Wastewater Handling Must Be Continuously Functioning** – Alternatives must ensure that the TAFB wastewater handling system is constantly functioning and providing adequate wastewater treatment for the Base.

B) **Wastewater Transfer Must Minimize Ground-Disturbing Activities** – Alternatives must limit trenching, excavation, and additional pipe construction to achieve proper wastewater management.

C) **Wastewater Treatment Must Support TAFB Current and Future Sanitary Sewer System Requirements** – Alternatives must be able to handle the treatment of current and future projected wastewater generated by TAFB.

D) **The Wastewater Capacity Handling of the Existing Lift Station Must Be Replaced within the Next Two Years to Avoid Lift Station Failure** – Alternatives must address the rapidly degrading condition of the existing lift station and provide a complete replacement of its wastewater transfer capabilities within the next two years to ensure there is no failure in proper wastewater management for TAFB.

E) **The Replacement for the Wastewater Handling of the Existing Lift Station Must Meet the Requirements Described in Unified Facilities Criterion (UFC) 3-240-01, *Wastewater Collection and Treatment*** – Alternatives must meet the UFC 3-240-01 requirement for wastewater collection and treatment.

F) **The Replacement Wastewater Handling of the Existing Lift Station Must Be Low Maintenance** – Alternatives must allow wastewater handling to be maintainable by in-house shops and technicians without requiring an additional service contract.

2.3 Descriptions of the Alternatives

The 60 AMW considered various alternatives for replacing the TAFB wastewater handling functions currently supported by the existing wastewater lift station. Those action alternatives are described in **Sections 2.3.1** through **2.3.6**. Alternatives considered included a No Action Alternative (**Section 2.3.7**); the No Action Alternative would not meet the purpose and need. However, analysis of the No Action Alternative provides a benchmark, enabling decision makers to compare the magnitude of the potential environmental effects of the Proposed Action; therefore, the No Action Alternative is carried forward for analysis in this EA.

2.3.1 Alternative 1: Construct Replacement/New Lift Station

The 60 AMW would replace and construct a new lift station adjacent to the existing lift station, route the piping to the new lift station, then demolish the existing lift station (see **Figure 1-2**). The new lift station, including a concrete pad, would have a permanent disturbance area of 5,490 square feet. The total temporary disturbance would be 26,300 square feet. Therefore, the total construction work area would be 31,790 square feet. Impacts would also occur from the rerouting of utilities, but those impacts would occur within the work site. A temporary backup generator would be installed at the new lift station.

It is anticipated that the construction of the new lift station and demolition of the existing lift station would be accomplished in two years or fewer. The exact equipment used during construction could vary slightly from the projections presented in **Table 2-1,** depending on contractor capabilities. However, these estimates provide a basis for analyzing related issue areas such as air quality, noise, and traffic. In addition to the equipment presented in **Table 2-1,** three half-ton or three quarter-ton pickup trucks would be used daily during lift station construction for approximately two years, for a total of 2,560 hours.

Table 2-1. Construction Equipment Assumptions Associated with Proposed Action

Equipment Type	Equipment Assumption	Horsepower	Assumed Equipment Model Year	Quantity	Total Hours
Bobcat	Bobcat CT2535	35	2019	2	2,560
Compactor	Wacker Neuson WP1540AW - 16.9-inch width, 3372 LB CF, Honda Engine, Water Tank	5	2020	2	2,560
Concrete Truck	Peterbilt 567	335	2015	2	1,280
Dump Truck	2015 Kenworth T400	380	2015	2	2,560
Flatbed	2013 Freightliner Cascadia Flatbed Truck	410	2013	2	2,560
Grader	CAT 140 / 140 AWD - LVR	250	2020	2	2,560

2.3.2 Alternative 2: Demolish and Replace the Lift Station

The 60 AMW would demolish the existing lift station and construct a new lift station in the same location (**Figure 1-2**). Under Alterative 2, the 60 AMW would truck all wastewater generated by TAFB to the FSSD wastewater treatment plant during the time required to demolish the existing lift station and construct a new lift station. Demolition of the existing lift station and construction of a new lift station would require approximately two years and would utilize similar equipment as described for Alternative 1.

2.3.3 Alternative 3: Repair the Existing Lift Station

The 60 AMW would make the necessary repairs to the existing lift station to ensure its continued operability for the next 20 years. Under Alternative 3, the 60 AMW would truck all wastewater generated by TAFB to the FSSD wastewater treatment plant during the time required to shut down the existing lift station for all necessary repairs. It is anticipated that the time required to implement repairs to the existing lift station would be similar to the length of time required to construct a new lift station, which would be approximately two years.

2.3.4 Alternative 4: Construct a New Lift Station at a Different Location

The 60 AMW would construct a new lift station, but the location of that lift station would not be adjacent to the existing lift station. Possible locations would be along the existing 18-inch-diameter force main but above the downstream 21-inch-diameter gravity pipe system. The 60 AMW would demolish the existing lift station following the construction and connection of a new lift station. Construction of the new lift station at a different location, connection of that lift station to the existing TAFB wastewater system, and demolition of the existing lift station would require approximately 2.5 years and would utilize equipment similar to that described for Alternative 1.

2.3.5 Alternative 5: Establish a Wastewater/Irrigation Treatment Facility Instead of Sending Wastewater to FSSD for Treatment

The 60 AMW would construct a wastewater treatment facility that would complete primary, secondary, and tertiary treatment of TAFB wastewater. The 60 AMW would construct a series of pipelines and pumps, and the tertiary treated wastewater would be returned as clean water useable for irrigation. The treated wastewater would be used by TAFB to irrigate both salt-tolerant and drought-tolerant plants on the Base, as tertiary treated wastewater is safe for irrigation but can have a high sodium to calcium and sodium to magnesium ratio. Following the completion of the construction of a new wastewater treatment plant, the existing lift station would be demolished. Construction of a new wastewater treatment plant and pipelines and pumps to distribute the tertiary treated wastewater from irrigation is estimated to require approximately seven years to be fully implemented at TAFB.

2.3.6 Alternative 6: Bioconversion of Wastewater to Methane for Treatment.

The 60 AMW would construct a wastewater treatment plant that would utilize bioconversion of wastewater to methane for treatment technology. Wastewater and sludge have been identified as having the potential for reuse and recycling, including energy generation through the

production of methane. Under Alternative 6, all of the TAFB wastewater would be treated at an on-Base wastewater treatment plant that would recycle all the wastewater to methane and other chemical components with commercial value. Following the completion of the construction of a new wastewater treatment plant, the existing lift station would be demolished. Construction of a new wastewater treatment plant that would allow for the bioconversion of wastewater to methane is estimated to require approximately five years to be fully implemented at TAFB.

2.3.7 No Action Alternative

Under the No Action Alternative, TAFB would continue to utilize the existing lift station to transfer wastewater generated by the Base to the FSSD for wastewater treatment. The existing lift station would continue to degrade, and increased maintenance would be required to support the lift station's operation. One staff member from 60 CES would be required to complete several daily checks of the lift station to ensure proper functionality. In the near future, likely in fewer than two years, the lift station will fail and there will be no available wastewater conveyance and disposal for TAFB.

2.4 Screening of Alternatives

Table 2-2 compares the alternatives that were identified as potentially meeting the purpose of and need for the Proposed Action and whether or not each would meet the selection standards presented in **Section 2.2.** Green indicates that the alternative would meet the requirements for that criterion; red indicates that the criterion under consideration would not be met.

2.5 Alternative Actions Considered but Eliminated from Further Analysis

Of the alternatives considered, one alternative (Alternative 1) and the No Action Alternative are carried forward for further analysis in this EA. The alternative actions considered but eliminated from further analysis are described in **Sections 2.5.1** through **2.5.5.**

2.5.1 Alternative 2: Demolish and Replace the Lift Station

The existing lift station could not realistically be first demolished and then replaced in its same location. During the entire time in which the lift station would be inoperable, all wastewater would be trucked off Base to a wastewater treatment plant. Assuming a large tanker truck can haul 6,000 gallons of wastewater, TAFB would require a minimum of 150 tanker trucks per day for wastewater removal while the lift station would be inoperable, which would likely be approximately two years. The logistics of managing and transporting that large of a volume of wastewater in tanker trucks daily are unrealistic. Further, the costs of the tanker truck transport of wastewater would likely greatly exceed the cost of the construction of a new lift station. The existing lift station should continuously operate while a replacement solution for treatment of the TAFB wastewater is implemented; therefore, Alternative 2 does not meet Selection Standards A, "Continuously Functioning Wastewater Handling," and C, "Supports Current and Future Sanitary Sewer System Requirements," and is not carried forward for further evaluation.

Table 2-2. Screening of the Alternatives

Alternative Descriptions	Selection Standards						Meets the Purpose and Need
	Continuously Functioning Wastewater Handling	Minimizes Ground-Disturbing Activities	Supports Current and Future Sanitary Sewer System Requirements	Capacity Replaced within the Next Two Years	Meets the Requirements Described in UFC 3-240-01	Replacement Facility Is Low Maintenance	
	A	B	C	D	E	F	
Alternative 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Alternative 2	No	Yes	No	Yes	Yes	Yes	Yes
Alternative 3	No	Yes	No	Yes	Yes	Yes	Yes
Alternative 4	Yes	No	Yes	No	Yes	Yes	Yes
Alternative 5	Yes	No	Yes	No	Yes	No	Yes
Alternative 6	Yes	No	Yes	No	Yes	No	Yes

UFC – Unified Facilities Criteria

2.5.2 Alternative 3: Repair the Existing Lift Station

Alternative 3 was eliminated from further consideration for the same reasons as Alternative 2. Wastewater would need to be transported to a wastewater treatment facility by truck for the duration of repairs to the existing lift station, as the lift station would be inoperable during those repairs. Therefore, Alternative 3 does not meet Selection Standards A, “Continuously Functioning Wastewater Handling,” and C, “Supports Current and Future Sanitary Sewer System Requirements.”

2.5.3 Alternative 4: Construct a New Lift Station at a Different Location

Alternative 4 was eliminated from further consideration because changing the location of the lift station by constructing a new lift station in a different location along the force main would require the extension of gravity wastewater pipes from the current lift station location to the new lift station location. This would increase the area of ground disturbance and volume of material to be excavated for pipeline construction. Further, the increased construction requirements would increase the length of time necessary to construct a new lift station. Therefore, Alterative 4 does

not meet Selection Standards B, “Minimizes Ground-Disturbing Activities,” and D, “Capacity Replaced within the Next Two Years.”

2.5.4 Alternative 5: Wastewater to Irrigation Water Instead of Sending Wastewater to FSSD for Treatment

Alternative 5 was eliminated from further consideration because the construction of a new wastewater treatment plant to recycle wastewater as irrigation water for TAFB would be a much greater undertaking than replacing the existing wastewater lift station. The area of ground disturbance would be substantially greater than would be needed to construct a new lift station; the length of time needed to design, permit, and build a wastewater treatment facility would extend well past two years, risking failure of the existing lift station; and the operation of a wastewater treatment plant would likely not be possible with existing 60 CES staff and would require outside contractor support. Therefore, Alternative 5 does not meet Selection Standards B, “Minimizes Ground-Disturbing Activities”; D, “Capacity Replaced within the Next Two Years”; and F, “Replacement Facility Is Low Maintenance.”

2.5.5 Alternative 6: Bioconversion of Wastewater to Methane for Treatment

Alternative 6 was eliminated from further consideration for the same reasons as Alternative 5. Alternative 6 would also require the construction of a new wastewater treatment facility on TAFB. Therefore, Alternative 6 does not meet Selection Standards B, “Minimizes Ground-Disturbing Activities”; D, “Capacity Replaced within the Next Two Years”; and F, “Replacement Facility Is Low Maintenance.”

2.6 Summary of Potential Environmental Consequences

The potential impacts associated with the Proposed Action are summarized in **Table 2-3**. The summary is based on information discussed in detail in **Chapter 3** of the EA and includes a concise definition of the issues addressed and the potential environmental impacts associated with each alternative action.

Table 2-3. Summary of Impacts

Resource	Alternative 1	No Action Alternative
Air Quality, Climate Change, and Greenhouse Gases	Emissions would be temporary and minor. Estimated emission levels would be below the *de minimus* threshold levels. No operational emissions would occur.	There would be no impacts on air quality, climate change, or greenhouse gases as no construction activities would occur.

Resource	Alternative 1	No Action Alternative
Water Resources	Short-term, minor, and adverse impacts on water resources would occur from soil disturbance during construction activities. Sediments from disturbed soils could be transported into surface water during stormwater events. Hazardous materials used during construction could impact surface and groundwater quality. BMPs implemented during construction would minimize these impacts.	No potential impacts on water resources would occur from construction activities as the new lift station would not be constructed. The continued degradation of the existing lift station would create the risk of a wastewater spill into the stormwater system, and eventually into the nearby conveyance ditch. Although TAFB would continue to take all possible precautions against the lift station failure and a wastewater spill, the risk would be greater than under the Proposed Action. Therefore, there is the potential for long-term, moderate adverse impacts on water resources, under the No Action Alternative.
Soils	Short-term, negligible, adverse impacts would occur on soils from construction activities. Soil disturbance could expose soils to increased erosion. No changes in impermeable surface area would take place following construction; therefore, no long-term impacts on soils from stormwater runoff-induced erosion would occur. BMPs implemented during construction would minimize these impacts.	No impacts on soils would occur as no construction activities would be performed, and there would be no changes in the impermeable surface area at TAFB.
Cultural Resources	No archaeological resources were identified on the surface during the Phase I intensive survey in the APE. Alternative 1 would not physically affect any NRHP-eligible archaeological sites. There would be no effect on NRHP-eligible buildings. Concurrence from the SHPO with the no adverse effect determination was received on 27 August 2024.	No impacts on cultural resources because there would be no ground-disturbing activities and no changes in the built environment.

Resource	Alternative 1	No Action Alternative
Biological Resources	The construction of a new lift station and demolition of the existing lift station would have short-term, negligible, adverse impacts on vegetation and wildlife. The existing lift station would be surveyed for bats prior to demolition, and bats would be evicted from the structure if present. All active bird nests would be avoided. The Proposed Action would likely adversely affect the California tiger salamander (*Ambystoma californiense*), vernal pool fairy shrimp (*Branchinecta lynchi*), and vernal pool tadpole shrimp (*Lepidurus packardi*). Conservation measures enumerated in the BA would be implemented and would ensure that federally listed species are protected and injury averted to the extent possible.	No impacts on biological resources from construction activities would occur. However, the continued degradation of the existing lift station would create the risk of a future wastewater spill into the nearby conveyance ditch, where biological resources could be adversely impacted, including sensitive fully aquatic resources. Although TAFB would continue to take all possible precautions against the lift station failure and a wastewater spill, the risk would be greater than under the Proposed Action. Therefore, there would be the potential for long-term, moderate, adverse impacts on biological resources under the No Action Alternative.
Noise	Temporary, minor, adverse impacts would occur as a result of noise from the proposed construction and demolition activities. At a distance of approximately 500 feet from the construction activities, the predicted maximum noise levels would drop below 65 dBA. No sensitive noise receptors would be impacted.	There would be no noise impacts because no construction activities would occur.
Infrastructure	Short-term, negligible, adverse impacts on transportation and solid waste management would occur; however, there would be long-term, beneficial impacts on wastewater management. Short-term utility interruptions could occur as utilities are removed from the old lift station and connected to the new lift station. The new lift station would reduce maintenance and extend the life and dependability of the TAFB wastewater conveyance and disposal system.	There would be no construction-related impacts on the TAFB infrastructure. However, the continued degradation of the existing lift station would create a risk of a future sanitary sewer system failure, which would also impact TAFB's ability to utilize the potable water system. Although TAFB would continue to take all possible precautions against lift station failure, the risk would be greater than under the Proposed Action. Therefore, there is the potential for long-term, moderate, adverse impacts on wastewater and potable systems at TAFB under the No Action Alternative.

Resource	Alternative 1	No Action Alternative
Health and Safety	Short-term, negligible, adverse impacts on health and safety are inherent to all construction and demolition activities. All construction personnel would be responsible for following federal and state safety regulations and DoD and OSHA safety standards and would be required to conduct construction activities in a manner that does not increase risk to workers, military personnel, or the public.	There would be no direct impacts on health and safety under the No Action Alternative because there would be no construction activities. However, additional maintenance and construction requirements to support the failing lift station would increase safety risks to workers.
Hazardous Materials and Wastes, ERP, and Toxic Substances	Short-term, negligible, adverse impacts on hazardous materials and wastes would occur as the quantity of hazardous materials used and hazardous waste generated would increase during construction. Impacts on ERP Sites OT0101 and FT005 would not be expected as all contaminated soils and groundwater would be either avoided during demolition and construction activities or prior to the disturbance a construction waiver generated. Monitoring wells would be avoided. The existing lift station would be surveyed for ACM, LBP, and PCBs, and those would be properly handled and disposed of if detected and encountered.	No impacts on hazardous materials and waste, ERP sites, or toxic substances would occur because there would be no construction activities.
Socioeconomics	Short-term, minor, beneficial impacts would occur from increased expenditures in the region during the lift station construction.	There would be no construction-related impacts on socioeconomics. However, the continued degradation of the existing lift station would create the risk of a future sanitary sewer system failure, which could impact the mission at TAFB. Although TAFB would continue to take all possible precautions against the lift station failure, the risk would be greater than under the Proposed Action. Therefore, there is the potential for long-term, moderate, adverse impacts on socioeconomics in the region if there was a mission-related stoppage of operations due to a lack of an operable sanitary sewer system at TAFB.

BMP – best management practice; **TAFB** – Travis Air Force Base; **APE** – Area of Potential Effect; **NRHP** – National Register of Historic Places; **SHPO** – State Historic Preservation Officer; **BA** – Biological Assessment; **dBA** – A-weighted decibel; **DoD** – Department of Defense; **OSHA** – Occupational Safety and Health Administration; **ERP** – Environmental Restoration Program; **ACM** – asbestos-containing material; **LBP** – lead-based paint; **PCB** – polychlorinated biphenyl

FORMAT PAGE

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the environment potentially affected by the Proposed Action and presents an analysis of potential environmental consequences of the identified alternatives for the implementation of the Proposed Action. NEPA requires that the analysis address those areas and the components of the environment with the potential to be affected; locations and resources with no potential to be affected need not be analyzed in detail. The existing conditions of each relevant environmental resource are described to give the public and agency decision makers a meaningful point from which to compare potential future environmental, social, and economic effects.

The criteria for evaluating impacts and assumptions for the analyses are presented for each resource area. Evaluation criteria for potential impacts were obtained from standard criteria; federal, state, or local agency guidelines and requirements; and/or legislative criteria. Impacts may be direct or indirect and are described in terms of type and degree, which is consistent with the CEQ NEPA regulations. “Direct effects” are caused by an action and occur at the same time and place as the action. “Indirect effects” are caused by the action and occur later in time or are farther removed from the place of impact but are reasonably foreseeable. “Cumulative effects” result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. The estimated total areas of disturbance of the Proposed Action used in evaluating impacts are provided in **Table 3-1.** There would be no new impacts from operations of the new lift station as the new lift station functions would replace the functions of the old lift station that would be demolished. This includes the emergency backup generator, which would be moved from the existing lift station to the new lift station; no new backup generators would be added.

Table 3-1. Estimated Total Area of Impacts

Proposed Action Component	Estimated Total Area of Disturbance (square feet)
Temporarily Disturbed Areas during Construction	26,300
Permanently Disturbed Areas from Lift Station Construction	5,490

3.1 Environmental Resource Areas Not Carried Forward for Detailed Analysis

It was determined that the Proposed Action would not have the potential for direct, indirect, or cumulative impacts on the following resource areas associated with the proposed construction and operation of a new lift station at TAFB. Therefore, these have not been carried forward for detailed analysis in this EA.

Airspace Management. There would be no changes or modifications to airspace, flight activities, or aircraft training activities as a result of the Proposed Action. The Proposed Action would not change the flight patterns for aircraft at TAFB or the special use airspace used for training activities. There would be no impacts on airspace management.

Land Use. There would be no change in land use associated with the construction of a new lift station at TAFB. All construction activities would occur within the boundaries of TAFB, and the lift station would replace the existing lift station, maintaining the same land use functions during the lift station operations.

Geology and Topography. The Proposed Action would not change or be impacted by the geology or topography at TAFB. The construction of a lift station at TAFB would only disturb surface soils through grading, contouring, and construction. The underlying geology would not be disturbed, and the topography of TAFB would not be altered. The lift station would be constructed to meet all code requirements for seismic activity. Therefore, there would be no impacts on geology or topography as a result of the Proposed Action. The lift station is proximate to IRP site FT005 and its associated monitoring wells, which are discussed in **Section 3.11**.

Socioeconomics – Housing and Education. There would be no change in the number of personnel assigned to TAFB as a result of the Proposed Action. All socioeconomic impacts associated with the construction and operation of a new lift station would be short term. Therefore, there would be no impacts on housing or school enrollment because of the proposed project.

Environmental Justice. EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*; EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*; and EO 14096, *Revitalizing Our Nation's Commitment to Environmental Justice for All*, direct federal agencies to address disproportionate environmental and human health effects in minority and low-income communities and to identify and assess environmental health and safety risks to children. However, there would be no disproportionate impacts on minorities, low-income populations, or children from the Proposed Action at TAFB. The proposed project is located entirely within TAFB, and construction activities, including construction noise, would not be experienced by the off-Base community.

3.2 Analyzed Resources and Regions of Influence

The expected geographic scope of potential environmental consequences is referred to as the region of influence (ROI). The ROI boundaries vary depending on the nature of each resource (**Table 3-2**). For example, the ROI for some resources, such as air quality, extends over a large jurisdiction unique to that resource.

Table 3-2. Region of Influence for the Proposed Action by Resource

Resource	Region of Influence
Air Quality, Climate Change, and Greenhouse Gases	San Francisco Bay Area Air Basin
Water Resources	TAFB
Soils	Temporary and Permanent Construction Areas on TAFB
Cultural Resources	Temporary and Permanent Construction Areas on TAFB
Biological Resources	TAFB
Noise	TAFB
Infrastructure	TAFB
Health and Safety	TAFB
Socioeconomics	Solano County, California
Hazardous Materials and Wastes, ERP, and Toxic Substances	TAFB

TAFB – Travis Air Force Base; **ERP** – Environmental Restoration Program

3.3 Air Quality, Climate Change, and Greenhouse Gases

Air quality is defined by ambient air concentrations of specific pollutants determined by the US Environmental Protection Agency (USEPA) to be of concern with respect to the health and welfare of the general public, vegetation, and property. These six major pollutants of concern, called "criteria pollutants," are carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), suspended and fine particulate matter (particulate matter less than 10 micrometers [PM_{10}] and particulate matter less than 2.5 micrometers [$PM_{2.5}$]), and lead (Pb).

3.3.1 Regulatory Setting

Under the authority of the Clean Air Act (CAA), the USEPA has established nationwide air quality standards to protect public health and welfare. These federal standards include National Ambient Air Quality Standards (NAAQS), which represent the maximum allowable atmospheric concentrations for the six criteria pollutants (**Table 3-3**).

Table 3-3. National and California Ambient Air Quality Standards

Pollutant	Standard Value [1, 2]		Standard Type [3, 4]
Carbon Monoxide (CO)			
8-Hour Average	9 ppm [5]	(10 mg/m^3)	CAAQS and NAAQS Primary
1-Hour Average	35 ppm	(40 mg/m^3)	NAAQS Primary
1-Hour Average	20 ppm	(23 mg/m^3)	CAAQS
Nitrogen Dioxide (NO_2)			
Annual Arithmetic Mean	0.053 ppm	(100 µg/m^3)	NAAQS Primary and Secondary
Annual Arithmetic Mean	0.030 ppm	(56 µg/m^3)	CAAQS
1-Hour Average	0.100 ppm	(188 µg/m^3)	NAAQS Primary
1-Hour Average	0.180 ppm	(339 µg/m^3)	CAAQS

Pollutant	Standard Value [1, 2]		Standard Type [3, 4]
Ozone (O_3)			
8-Hour Average	0.070 ppm	(137 µg/m^3)	CAAQS and NAAQS Primary and Secondary
1-Hour Average	0.090 ppm	(177 µg/m^3)	CAAQS
Lead (Pb) [6]			
3-Month Average	–	0.15 µg/m^3	NAAQS Primary and Secondary
30-Day Average	–	1.5 µg/m^3	CAAQS
Particulate ≤10 Micrometers (PM10)			
24-Hour Average	–	150 µg/m^3	NAAQS Primary and Secondary
24-Hour Average	–	50 µg/m^3	CAAQS
Annual Arithmetic Mean	–	20 µg/m^3	CAAQS
Particulate ≤2.5 Micrometers ($PM_{2.5}$)			
Annual Arithmetic Mean	–	12 µg/m^3	CAAQS and NAAQS Primary
Annual Arithmetic Mean	–	15 µg/m^3	NAAQS Secondary
24-Hour Average	–	35 µg/m^3	NAAQS Primary and Secondary
Sulfur Dioxide (SO_2)			
1-Hour Average	0.075 ppm	(196 µg/m^3)	NAAQS Primary
3-Hour Average	0.250 ppm	(655 µg/m^3)	CAAQS
3-Hour Average	0.500 ppm	(1,300 µg/m^3)	NAAQS Secondary
24-Hour Average	0.040 ppm	(105 µg/m^3)	CAAQS
Visibility-Reducing Particles			
8-Hour Average	Extinction of 0.23 per kilometer	–	CAAQS
Sulfates			
24-Hour Average	–	25 µg/m3	CAAQS
Hydrogen Sulfide			
1-Hour Average	0.030 ppm	–	CAAQS
Vinyl Chloride [6]			
24-Hour Average	0.1 ppm	–	CAAQS

Source: USEPA 2018, 2020; California Air Resources Board 2024
ppm – parts per million; **mg/m^3** – milligrams per cubic meter; **CAAQS** – California Ambient Air Quality Standards; **NAAQS** – National Ambient Air Quality Standards; **µg/m^3** – micrograms per cubic meter

Pollutants
CO – carbon monoxide; **NO_2** – nitrogen dioxide; **O_3** – *ozone; **Pb** – lead; **PM_{10}** – particulate matter less than 10 micrometers in diameter; **$PM_{2.5}$** – particulate matter less than 2.5 micrometers in diameter; **SO_2** – sulfur dioxide
Notes:

1 NAAQS (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth-highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

2 CAAQS for O_3, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, and PM_{10}, and visibility-reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.

Pollutant	Standard Value [1, 2]	Standard Type [3, 4]

[3] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[4] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[5] Concentrations are first expressed in the units in which the rule was promulgated. Concentration in ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.

[6] The California Air Resources Board has identified lead and vinyl chloride as “toxic air contaminants” with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Under the CAA, the country is classified into attainment, nonattainment, and maintenance areas for NAAQS. Any area not meeting the NAAQS is designated as “nonattainment” for the specific pollutant or pollutants, whereas areas meeting the NAAQS are designated as “attainment.” Maintenance areas are those areas previously designated as “nonattainment” and subsequently redesignated to “attainment,” subject to development of a maintenance plan.

Under the USEPA's New Source Review (NSR) program, stationary sources of air pollution are required to have permits before construction of the source begins. NSR Prevention of Significant Deterioration approval would be required if the proposed project was either a new source, had the potential to emit 250 tons per year (tpy) or more of an attainment pollutant, or was an existing major source of emissions, making it a major modification in an attainment area, which would result in a net emissions increase above specified levels. Nonattainment NSR approval would be required if the proposed project was a new stationary source or a major source, making it a major modification in a nonattainment area with potential to emit nonattainment pollutants in excess of the NSR thresholds.

The CAA General Conformity Rule (40 CFR 6, 51, and 93) requires federal agencies to make written conformity determinations for federal actions in or affecting nonattainment or maintenance areas. If the emissions of a criteria pollutant (or its precursors) do not exceed the *de minimis* level, then the federal action has minimal air quality impacts. Therefore, the action is determined to conform for the pollutant under study, and no further analysis would be necessary.

The California Air Resources Board (CARB) oversees California air quality regulations. The California Ambient Air Quality Standards (CAAQS) are generally more stringent than the NAAQS. The CAAQS includes all NAAQS pollutants as well as sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulates (see **Table 3-3**).

The California CAA requires each local air district in which ambient concentrations violate the CAAQS to prepare an air quality management plan to achieve compliance with the CAAQS as a part of the State Implementation Plan. CARB is responsible for the State Implementation Plan for nonattainment pollutants but relies on each local air district to adopt mandatory statewide programs and provide additional strategies tailored for sources under their jurisdiction. TAFB is at the eastern edge of the San Francisco Bay Area Air Basin (Basin), which extends from Napa County in the north to Santa Clara County in the south, San Francisco County to the west and Solano County to the east. The Basin is under the jurisdiction of the Bay Area Air Quality

Management District (BAAQMD) as mandated by CARB and is located in the BAAQMD Eastern District.

EO 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis,* and EO 14008, *Tackling the Climate Crisis at Home and Abroad*, require federal agencies to evaluate climate change impacts from their proposals. *National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change* (88 Federal Register 1196) provides guidance on the inclusion of greenhouse gas (GHG) emissions and climate change analyses and their social costs as part of the environmental baseline for NEPA. GHGs are compounds that may contribute to accelerated climate change by altering the thermodynamic properties of the earth's atmosphere. GHGs consist of carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, and perfluorocarbons (FedCenter 2024).

3.3.2 Affected Environment

Most of California has a Mediterranean climate, with mild, wet winters and hot, dry summers. The Pacific Ocean has moderating effects on the climate, with inland valleys experiencing more extreme weather events than places along the coast. The average annual temperature at TAFB is 59 degrees Fahrenheit (°F). The lowest temperatures occur in January, with an average low temperature of 38°F, and the highest temperatures occur in July, with an average high temperature of 89°F. Annual average precipitation is 22.7 inches, with the most rainfall occurring in December, January, and February, averaging 4.3, 4.0, and 4.8 inches, respectively. Hot, dry summers with low relative humidity increases wildlife risk (TAFB 2022).

The Basin is designated nonattainment for state O_3 standards, PM_{10}, and $PM_{2.5}$ (BAAQMD 2024). For federal standards, the Basin is designated nonattainment for 8-hour O_3 and 24-hour $PM_{2.5}$. All other criteria pollutants are designated attainment or are unclassified. Although monitoring data show that the Basin meets national and state standards for $PM_{2.5}$, it is still formally designated as nonattainment for several $PM_{2.5}$ standards. Regarding the national standards, the nonattainment designation will continue to apply until the BAAQMD submits, and the USEPA approves, a redesignation request and a maintenance plan.

In the Basin from 2010 to 2019 (2019 has the most recent data available from BAAQMD), there were no exceedances of CO or SO_2 for the NAAQS or CAAQS (**Table 3-4**). NO_2 levels exceeded the NAAQS twice during the 10-year period, with no exceedances of the CAAQS. Concentrations of O_3 exceeded the NAAQS (8-hour) and CAAQS (1-hour and 8-hour) annually from 2010 to 2019. PM_{10} levels exceeded the NAAQS only in 2018 but exceeded the CAAQS standards in all years except 2016. National $PM_{2.5}$ standards also exceeded the NAAQS in all years except 2016.

Table 3-4. Number of Days of Exceedances of Criteria Pollutants Recorded in the Bay Area Air Quality Management District (2010 – 2019)

Year	O_3			CO				NO_2		SO_2		PM_{10}		$PM_{2.5}$
	8-hr	1-hr	8-hr	1-hr		8-hr		1-hr		1-hr	24-hr	24-hr		24-hr
	Nat	Cal	Cal	Nat	Cal	Nat	Cal	Nat	Cal	Nat	Cal	Nat	Cal	Nat
2010	11	8	11	0	0	0	0	0	0	0	0	0	2	6
2011	9	5	10	0	0	0	0	0	0	0	0	0	3	8
2012	8	3	8	0	0	0	0	1	0	0	0	0	2	3
2013	3	3	3	0	0	0	0	0	0	0	0	0	6	13
2014	9	3	10	0	0	0	0	0	0	0	0	0	2	3
2015	12	7	12	0	0	0	0	0	0	0	0	0	1	9
2016	15	6	15	0	0	0	0	0	0	0	0	0	0	0
2017	6	6	6	0	0	0	0	1	0	0	0	0	6	18
2018	3	2	3	0	0	0	0	0	0	0	0	1	6	18
2019	9	6	9	0	0	0	0	0	0	0	0	0	5	1

Source: BAAQMD 2019

O_3 – ozone; **CO** – carbon monoxide; **NO_2** – nitrogen dioxide; **SO_2** – sulfur dioxide; **PM_{10}** – particulate matter, less than 10 microns; **$PM_{2.5}$** – particulate matter, less than 2.5 microns; **hr**- hour; **Nat** – national; **Cal** – California

Climate Change and Greenhouse Gases. The total carbon dioxide equivalent (CO_2e) emissions generated by California in 2021 was 381.3 million metric tons. Total state GHG emissions peaked in 2004, and California's GHG emissions have been decreasing and have remained below California's 2020 GHG limit since 2014. The transportation sector is the largest source of GHG emission in California, accounting for 38.2 percent of 2021 statewide emissions. Other large sources of GHG emissions in California include the electricity sector, industrial sector, and commercial and residential sector. California has had a considerable increase in in-state hydro, solar, and wind electricity generation since 2014, with a general reduction in demand for other fuel types for electricity generation (CARB 2023).

As a part of the Inflation Reduction Act, the Climate Pollution Reduction Grant Program provides states, local governments, territories, and tribes with funds to develop and implement plans to mitigate climate impacts through the reduction of GHG emissions and other harmful air pollutants. California developed a Draft Priority Climate Action Plan, which identifies California's highest-priority state and local GHG reduction measures (State of California 2024).

3.3.3 Environmental Consequences

An action could result in significant impacts on air quality if the proposed action implementation would expose people to localized air pollution concentration in excess of NAAQS and CAAQS, or exceed limits imposed by federal and state GHG regulations. The Basin is designated as nonattainment for O_3 standards, PM_{10}, and $PM_{2.5}$. Therefore, the General Conformity Rule (CAA Section 176(c)) is applicable to emissions from the Proposed Action.

General conformity assessment requires that federal agencies prepare a written conformity assessment for federal actions in areas (or affecting areas) which are in nonattainment or maintenance for the NAAQS. The DAF's Air Conformity Applicability Model (ACAM) was used to estimate the total direct and indirect emissions from the Proposed Action. The estimate of air

emissions was compared to the *de minimis* threshold levels defined in the General Conformity Rule. If emission-level estimates for the Proposed Action are below the threshold levels, a Record of Conformity Analysis (ROCA) is prepared. If emission-level estimates exceed the *de minimis* threshold levels, a detailed conformity determination is subsequently required. For attainment area criteria pollutants, the USEPA's Prevention of Significant Deterioration permitting threshold of 250 tpy as an initial indicator of the potential for significant impacts on air quality. Therefore, for criteria pollutants in which the ROI is in attainment, the analysis of air quality compared the estimated emissions to the 250 tpy Prevention of Significant Deterioration permitting threshold.

The Proposed Action includes construction, demolition, earth grading, and trenching of utilities. Project criteria pollutant emissions estimated using ACAM would primarily be associated with earth disturbance, operation of diesel-fuel construction equipment and vehicles hauling materials, worker trips on the site, and architectural coating applications. CO_2 emissions would be mainly from fuel combustion from equipment and worker vehicles during construction, demolition, and renovation activities. There would be no new operational emissions.

Precautions to reduce fugitive dust (PM_{10}) during demolition, construction, and grading would be implemented. These include the application of water or approved chemical dust suppressants on exposed soil and on unpaved roads; proper soil stockpiling methods; and application of ground cover such as native hydroseeding of disturbed soils. Other measures would include the proper use of equipment per manufacturer's instructions and reduced engine idling times to decrease combustion emissions during construction. These construction best management practices (BMPs) would reduce dust and other pollutant emissions to levels far below those estimated by ACAM.

For GHG emissions evaluation, the Prevention of Significant Deterioration threshold of 75,000 tpy of CO_2e, or 68,039 metric tons per year, was used as an insignificance indicator to evaluate air quality impacts in all areas. A GHG emissions evaluation establishes the quantity of speciated GHGs and CO_2e, determines if an action's emissions are insignificant, and provides a relative significance comparison. Actions with a net change in GHG (i.e., CO_2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Only actions with GHG emissions above the insignificance indicator (threshold) are considered potentially significant and require further assessment to determine if the action poses a significant impact (Air Force Civil Engineer Center, Compliance Technical Support Branch 2024).

Even though the Proposed Action would be implemented over an up to two-year period, to be conservative, and following Air Force Civil Engineer Center policy, all construction activities are assumed to occur within a single calendar year in 2025.

ACAM model assumptions, ACAM detail emissions calculations, and ACAM summary results are provided in **Appendix B.**

3.3.3.1 Alternative 1: Construct Replacement/New Lift Station

Table 3-5 presents estimated emissions from construction and demolition activities. There would be temporary, minor, adverse impacts on air quality from the proposed construction activities. A General Conformity Applicability Analysis was conducted; it was determined that estimated emission levels would be below the *de minimus* threshold levels for the precursors of O_3 (volatile organic compound and NO_x), $PM_{2.5}$, and PM_{10}. Because the emissions are below the *de minimus* threshold, the requirements of the General Conformity Rule are not applicable and a ROCA has been prepared (**Appendix B).** Estimated air emissions for criteria pollutants for which the ROI is in attainment and has no maintenance area designations would be less than the insignificance indicators (**Table 3-5**).

Table 3-5. Estimated Air Emissions for the Proposed Action Implementation

Activity	Pollutant Estimated Emissions (tpy)[1]								
	VOC	**NO_x**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**Pb**	**NH_3**	**CO_2e**
Proposed Action	0.412	3.100	3.747	0.006	4.419	0.123	0.000	0.004	580
Nonattainment Insignificance Indicator	100	100	-	100	100	100	-	-	-
Attainment Insignificance Indicator	-	-	250	-	-	-	25	250	75,000
Exceedance (Yes/No)	No	No	No	No	No	No	No	No	No

tpy – tons per year; **VOC** – volatile organic compound; **NO_x** – nitrogen oxides; **CO** – carbon monoxide; **SO_x** – sulfur oxides; **PM_{10}** – particulate matter less than 10 microns; **$PM_{2.5}$** – particulate matter less than 2.5 microns; **Pb** – lead; **NH_3** – ammonia; **CO_2e** – carbon dioxide equivalent; **BAAQMD** – Bay Area Air Quality Management District

[1] ACAM estimated emissions (see Appendix B)

Construction emissions would occur from fugitive dust during grading and trenching activities, operation of diesel-fuel construction equipment, and vehicles hauling materials and workers. These emissions would be temporary, occurring only for the duration of construction. Estimated emissions from construction would be well below the *de minimus* thresholds for all criteria pollutants and GHGs. After completion of the lift station construction, operations would return to normal, and no new sources of emissions would be generated.

GHG emissions would occur during construction and demolition activities. GHG emissions would primarily result from operation of construction equipment and vehicles powered by fossil fuels. GHG emissions from the implementation of the Proposed Action would represent 0.00014 percent of California's annual GHG emissions. As a result, the emissions of CO_2e are considered too small on a regional and national scale for further analysis.

3.3.3.2 No Action Alternative

Under the No Action Alternative, the new lift station would not be constructed. No additional emissions would be generated; as a result, existing conditions would remain unchanged. No air quality impacts would be anticipated.

3.4 Water Resources

Water resources include surface waters, groundwater, and floodplains. Surface waters include all lakes, ponds, rivers, streams, impoundments, and wetlands within a defined area or watershed. Wetlands are transitional areas between terrestrial and aquatic systems with land covered by shallow surface water. Groundwater resources include water contained in soils, permeable and porous rock, or unconsolidated substrate. Floodplains are areas that are flooded periodically by the lateral overflow of surface water bodies.

Surface waters, as defined in 33 CFR 328.3, are regulated under Sections 401 and 404 of the Clean Water Act (CWA; 33 USC § 1251 et seq.) and Section 10 of the Rivers and Harbors Act. The CWA regulates discharges of pollutants in surface waters of the US. Section 404 of the CWA establishes a program to regulate the discharge of dredged and fill material into waters of the US, including wetlands. The US Army Corps of Engineers defines wetlands as “those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions” (Environmental Laboratory 1987). Wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR 328). Federal protection of wetlands is also promulgated under EO 11990, *Protection of Wetlands,* the purpose of which is to reduce adverse impacts associated with the destruction or modification of wetlands. This order directs federal agencies to provide leadership in minimizing the destruction, loss, or degradation of wetlands.

The CWA provides the authority to establish water quality standards, control discharges into surface and subsurface waters (including groundwater), develop waste treatment management plans and practices, and issue permits for discharges. A National Pollutant Discharge Elimination System (NPDES) permit under Section 402 of the CWA is required for discharges into surface waters. The USEPA oversees the issuance of NPDES permits at federal facilities as well as water quality regulations (Section 401 of the CWA) for both surface and groundwater within states. With the Supreme Court’s decision in Sackett v. USEPA, 143 S. Ct. 1322 (2023), TAFB is no longer subject to CWA regulations. Due to this ruling, all permits and requirements that had a basis under the CWA no longer apply.

Groundwater is water that occurs in the saturated zone beneath the earth’s surface and includes underground streams and aquifers. It is an essential resource that functions to recharge surface water and can be used for drinking, irrigation, and industrial processes. Groundwater typically can be described in terms of depth from the surface, aquifer or well capacity, water quality, recharge rate, and surrounding geologic formations. The susceptibility of aquifers to groundwater contamination relates to geology, depth to groundwater, infiltration rates, and solubility of contaminants. Groundwater resources are regulated on the federal level by the USEPA under the Safe Drinking Water Act, 42 USC § 300f et seq. The USEPA’s Sole Source Aquifer Program, authorized by the Safe Drinking Water Act, further protects aquifers that are designated as critical to the water supply and makes any proposed federal or federal financially assisted project that has the potential to contaminate the aquifer subject to USEPA review.

Floodplains are areas of low-level ground along rivers, stream channels, or coastal waters that provide a broad area to inundate and temporarily store floodwaters. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body. Floodplains are subject to periodic or infrequent inundation due to rain or melting snow. Risk of flooding typically hinges on local topography, the frequency of precipitation events, and the size of the watershed above the floodplain. Flood potential is evaluated and mapped by the Federal Emergency Management Agency, which defines the 100-year (regulatory) floodplain. The 100-year floodplain is the area that has a 1 percent chance of inundation by a flood event in a given year. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety.

EO 11988, *Floodplain Management*, provides guidelines that agencies should carry out as part of their decision making on projects that have potential impacts to or within the floodplain. This EO requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

3.4.1 Affected Environment

Surface Water. TAFB is no longer regulated under the CWA. The ditch proximate to the lift station (formerly referred to as Union Creek) is no longer subject to CWA regulations. It is deemed a stormwater conveyance ditch. Approximately 2,900 acres of upstream watershed drain into the conveyance ditch north of TAFB. Approximately 5,000 acres of additional drainage area are contributed to the stormwater drainage system by TAFB property (TAFB no date). TAFB is divided into eight distinct drainage basins according to topography and drainage patterns. Six of these basins discharge through a series of underground piping and open ditches to stormwater outfalls along the conveyance ditch, Hill Slough, and ultimately Suisun and San Francisco bays. This includes the Proposed Action area (TAFB 2022).

Surface water flow onto TAFB mainly consists of the western and eastern branches of the conveyance ditch. The western branch of the conveyance ditch fills with water during heavy rains and is the main drainage for a large area of the western side of the base (TAFB 2022).

The eastern branch of the conveyance ditch enters TAFB from the north through the center of the Georgetown housing area. It flows south through belowground drainage structures under the flightline then continues in an above ground channel to the southwest where it joins the western branch of the conveyance ditch (TAFB 2022).

Groundwater. TAFB is not underlain by extensive water-bearing materials compared to the deposits of the Great Valley (Putah Plain area) to the northeast of TAFB and the Fairfield/Green Valley to the west of TAFB. There are no major water supply wells near TAFB. However, there are extensive water supply well fields to the northeast and west of TAFB. For example, water supply wells located 5 miles north of TAFB on Cypress Lakes Golf Course account for approximately 75 million gallons of potable water supply annually. Groundwater occurs at TAFB in shallow deposits and flows south of TAFB into the Suisun Marsh, to Suisun Bay, and

ultimately into the San Francisco Bay, generally following the surface topography. Recharge to the shallow groundwater table is from the foothills of Cement Hill to the north, in channel infiltration from the drainage area of nearby creeks (Denverton Creek, and smaller, unnamed creeks northwest of the Base) and the conveyance ditch, and through direct precipitation (TAFB 2022).

More than 4 million gallons of groundwater are extracted from contaminated groundwater plumes under TAFB monthly. This extracted groundwater is treated and discharged to a conveyance ditch, pursuant to two interim Groundwater Records of Decision with the USEPA, the California Department of Toxic Substances Control, and the San Francisco Bay Regional Water Quality Control Board. This treated groundwater supplements the flow of the eastern branch of the conveyance ditch (TAFB 2022).

Floodplains. A small portion of the proposed lift station construction area overlaps with the 100-year (i.e., 1 percent chance of being exceeded in any one year). The new lift station would not be located in a 100-year floodplain (**Figure 3-1**). Historical flooding has ranged in severity from nuisance flooding to dangerous and damaging flood conditions at several locations on TAFB. During a storm in January 1997, flooding necessitated the evacuation of an on-Base residential area and caused flooding near the active runway areas and South Gate. Other occasions of historical flooding have been associated with the water buildup on airfield pavements due to inadequate drainage, which creates a hazardous environment for TAFB's military mission (TAFB no date).

Wetlands. There are no jurisdictional wetlands or waters of the US in the Proposed Action area. (**Figure 3-2**). Seasonal wetland and vernal pool habitats are located within approximately 250 feet of the Proposed Action area (**Figure 3-2**).

3.4.2 Environmental Consequences

3.4.2.1 Alternative 1: Construct Replacement/New Lift Station

The proposed lift station construction would have short-term, minor, adverse impacts on water resources. Construction activities would disturb soils, potentially transporting sediments and other material in stormwater into the wetlands proximate to the construction area, and into the nearby conveyance ditch. Stormwater could also transport hazardous materials used during the construction activities, such as petroleum, oil, and lubricants (POLs) used in construction equipment. POLs have the potential to impact both surface water and groundwater quality.

There would be no substantial change in the impervious surface areas following the completion of the construction of the new lift station and demolition of the existing lift station. Therefore, there would be no long-term changes to surface water runoff volume from impervious surfaces.

Figure 3-1. Location of the 100-Year Floodplain Relative to the Proposed New Lift Station

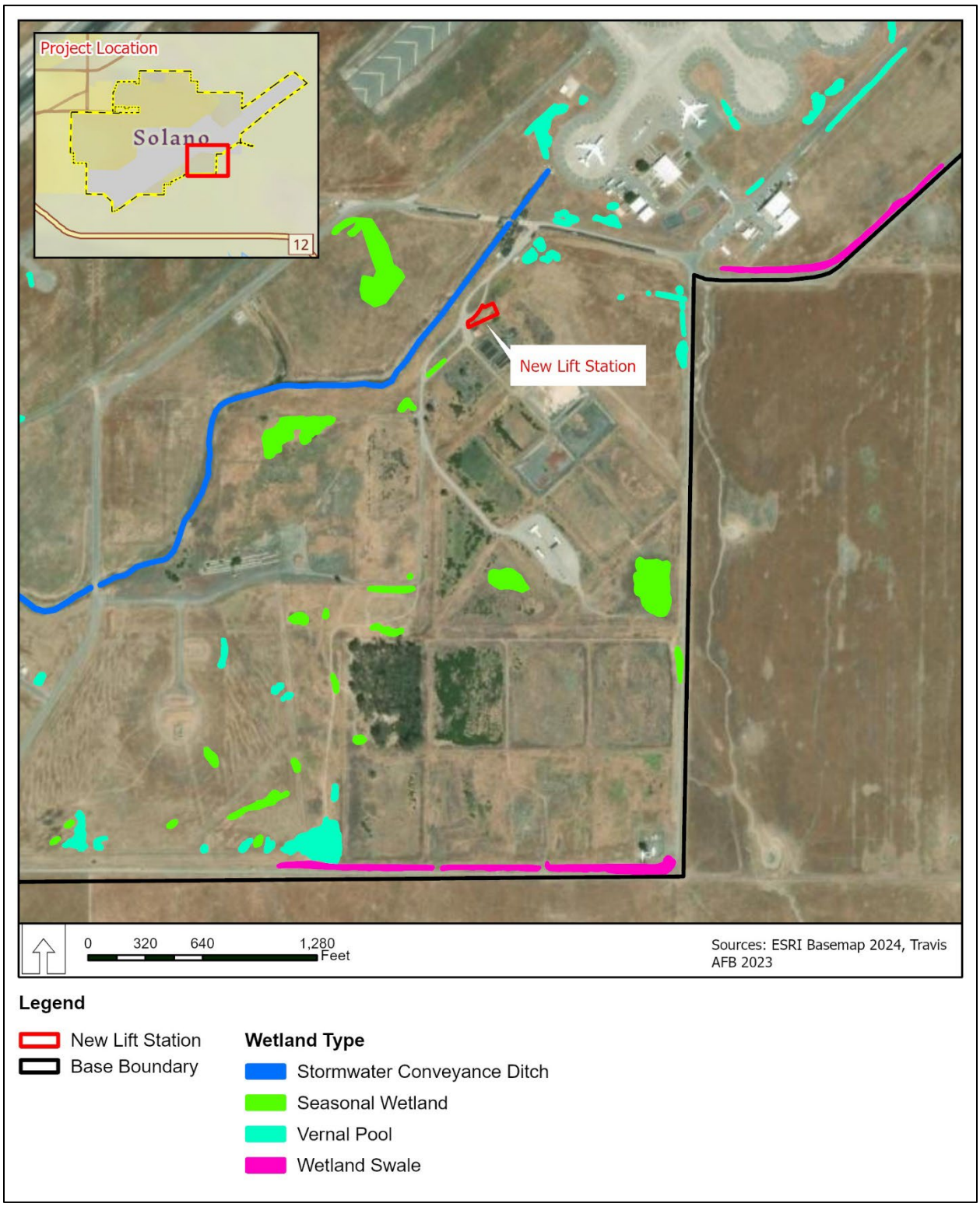

Figure 3-2. Wetlands Proximate to the Proposed New Lift Station

The proposed lift station construction is less than 1 acre and therefore would not be required to comply with a NPDES Construction General Permit for construction activities. Further, TAFB is no longer subject to CWA regulations. However, construction activities would implement BMPs to prevent pollutants and sediment from entering nearby seasonal wetlands and vernal pools following species-specific minimization measures detailed in the Proposed Action's Biological Assessment (BA; **Appendix C**). During construction, contractors would be responsible for preventing pollutants, including POLs, sediment, and construction material, from entering stormwater by the use of BMPs. BMPs would include proper stockpiling of excavated soils, use of sediment traps, proper storage of material, placement of silt fencing around the construction site, and inspections. The operation of the lift station would comply with all FSSD permits related to their wastewater treatment and management operations.

3.4.2.2 No Action Alternative

Under the No Action Alternative, there would be no potential for construction-related impacts on water resources as a new lift station would not be constructed and the existing lift station would remain in operation. However, with the continued degradation of the existing lift station, there would be a risk of an overflow in the sanitary sewer system, which would halt the use of the sanitary sewer system and could potentially cause a wastewater spill into the stormwater system. Although TAFB would continue to take all possible precautions against the lift station failure and a wastewater spill, the risk would be greater than under the Proposed Action. Therefore, there is the potential for long-term, moderate, adverse impacts on water resources under the No Action Alternative.

3.5 Soils

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

3.5.1 Affected Environment

Sixteen soil types (**Figure 3-3**) are described within TAFB; however, only one soil type occurs within the Proposed Action area. The San Ysidro sandy loam, 0 to 2 percent slopes, is moderately well drained soil on dry alluvium fans and terraces. The typical soil profile of the San Ysidro is as follows: 0 to 14 inches sandy loam, 14 inches to 28 inches clay loam, 28 inches to 54 inches sandy clay loam, and 54 inches to 68 inches stratified sandy loam to clay loam (Natural Resources Conservation Service 2024).

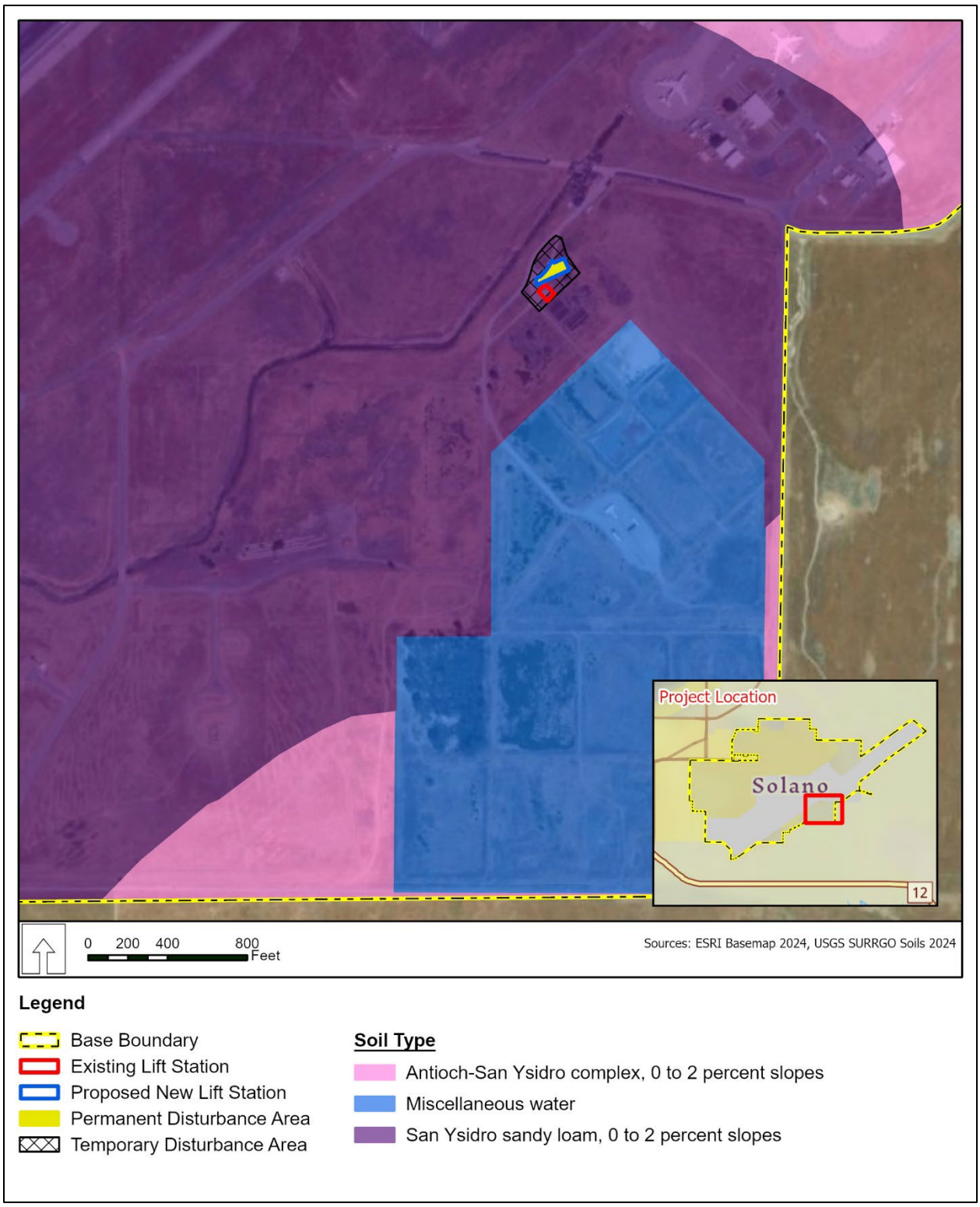

Figure 3-3. Soil Types at the Proposed Lift Station at Travis Air Force Base

3.5.2 Environmental Consequences

Factors considered in determining whether implementing an alternative may have a significant adverse impact on soils include the extent or degree to which implementation of an alternative would do the following:

- Result in substantial soil erosion or the loss of topsoil.
- Expose people or structures to potential substantial adverse effects, involving construction of facilities on inappropriate soil types.

3.5.2.1 Alternative 1: Construct Replacement/New Lift Station

The proposed construction of a new lift station along with the demolition and removal of the former lift station would have short-term, negligible, adverse impacts on soils. The primary short-term effects would occur during construction activities when vegetation is cleared and approximately 26,300 square feet of soils are temporarily disturbed (due to grading and earthmoving associated with proposed construction and demolition at the site). Because soil disturbance during construction can expose soils to erosion, appropriate sediment and soil control techniques would be used during construction to minimize soil loss. Soil erosion during and at the conclusion of the construction and demolition activities would be prevented through the implementation of BMPs following TAFB's general Stormwater Pollution Prevention Plan (SWPPP). Examples of erosion and sediment control BMPs include soil erosion control mats, silt fences, straw bales, diversion ditches, riprap channels, water bars, water spreaders, watering exposed soils to reduce dust, and sediment basins. Disturbed soils would be revegetated following all construction and demolition activities to reduce the likelihood of long-term soil erosion. There would be no substantial increase in impermeable surfaces following construction that could cause long-term soil erosion from changes in stormwater runoff.

3.5.2.2 No Action Alternative

There would be no construction of a new lift station. Therefore, there would be no soil disturbance under the No Action Alternative, and no impacts on soils.

3.6 Cultural Resources

Cultural resources are any prehistoric or historic district, site, building, structure, or object considered important to a culture or community for scientific, traditional, religious, or other purposes. These resources are protected and identified under several federal laws and EOs. Cultural resources include the following subcategories:

- Archaeological (i.e., prehistoric or historic sites where human activity has left physical evidence of that activity but no structures remain standing)
- Architectural (i.e., buildings or other structures or groups of structures, or designed landscapes that are of historic or aesthetic significance)

- Traditional cultural properties (resources of traditional, religious, or cultural significance to Native American tribes)

Significant cultural resources are those that have been listed on the NRHP or determined to be eligible for listing. To be eligible for inclusion in the NRHP, properties must be 50 years old and have national, state, or local significance in American history, architecture, archaeology, engineering, or culture. They must possess sufficient integrity of location, design, setting, materials, workmanship, feeling, and association to convey their historical significance and meet at least one of four criteria:

- Associated with events that have made a significant contribution to the broad patterns of our history (Criterion A)
- Associated with the lives of persons significant in our past (Criterion B)
- Embody distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction (Criterion C)
- Have yielded or be likely to yield information important in prehistory or history (Criterion D)

Properties that are less than 50 years old can be considered eligible for the NRHP under Criterion Consideration G if they possess exceptional historical importance. Those properties must also retain historic integrity and meet at least one of the four NRHP criteria (A, B, C, or D). The term “historic property” refers to national historic landmarks and to NRHP-listed and NRHP-eligible cultural resources.

Federal laws protecting cultural resources include the Archaeological and Historic Preservation Act of 1960 as amended, the American Indian Religious Freedom Act of 1978, the Archaeological Resources Protection Act of 1979, the Native American Graves Protection and Repatriation Act of 1990, and the NHPA, as amended through 2016, and associated regulations (36 CFR 800). The NHPA requires federal agencies to consider the effects of federal undertakings on historic properties prior to making a decision or taking an action and to integrate historic preservation values into their decision-making process. Federal agencies fulfill this requirement by completing the Section 106 consultation process, as set forth in 36 CFR 800. Section 106 of the NHPA also requires agencies to consult with federally recognized Native American tribes with a vested interest in the undertaking.

Section 106 of the NHPA requires all federal agencies to seek to avoid, minimize, or mitigate adverse effects on these properties (36 CFR 800.1[a]). For cultural resource analysis, the Area of Potential Effects (APE) is used as the ROI. The APE is defined as the “geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist” (36 CFR 800.16[d]), and thereby diminish their historic integrity. The APE for direct effects includes the footprint of the proposed new lift station construction and existing lift station demolition area composing the Proposed Action

(areas of potential direct disturbance), which is provided in **Table 3-1.** For architectural resources, the APE for indirect effects is a 1,000-foot buffer around the Proposed Action area.

3.6.1 Affected Environment

A cultural resource record search and literature review was conducted within the APE and a broader 0.25-mile records search buffer at the California Historical Resources Information System, Northwest Information Center housed at Sonoma State University. The results of the search indicate 100 percent of the APE has been previously inventoried. No sites were identified in the APE. However, two historic-era resources (P-48-000763 and P-48-000972) were identified within the broader 0.25-mile area, both of which are determined to be ineligible for inclusion in the NRHP. A Sacred Lands File search request was also submitted to the Native American Heritage Commission for the area within the APE, as well as the 0.25-mile records search buffer. The Sacred Lands File's results were negative for cultural resources, and a list of Native American contacts was provided for verification of potential sacred lands (ASM Affiliates 2024).

The existing lift station is an element of a wastewater treatment facility constructed in 1946 and numbered Building 1150. The DAF determined the wastewater treatment facility was ineligible for inclusion in the NRHP, and the California SHPO concurred in a letter dated 2 July 2018 (DAF 2021: Appendix M). The DAF demolished two Imhoff tanks, a settling tank, manhole structures, and capped associated piping and utilities. Active treatment equipment and the pump house (i.e., lift station) remained intact.

A Phase I intensive archaeological pedestrian survey of the APE was conducted on 24 April 2024. The survey included parallel southwest-northeast transects spaced approximately 5 meters (16.4 feet) apart. Ground visibility was moderate, and no cultural resources were identified during the pedestrian survey. The APE is disturbed by previous grading, paved and gravel roads, construction of structures, buried sewer and water lines, and rock-lined drainages. Most of the vegetation observed are invasive species that typically grow in disturbed soils. A geoarchaeological overview and site sensitivity assessment indicates the surface of the APE has a high potential for precontact resources, but the potential to encounter buried resources is very low. No resources were identified on the surface, and based on the pedestrian survey and geoarchaeological sensitivity assessment, there is low potential to encounter significant cultural resources during construction (ASM Affiliates 2024).

3.6.2 Environmental Consequences

Adverse impacts on cultural resources could include altering characteristics of the resource that make it eligible for listing in the NRHP. Such impacts could include introducing visual or audible elements that are out of character with the property or its setting; neglecting the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of agency ownership (or control) without adequate enforceable restrictions or conditions to ensure preservation of the property’s historic significance. For the purposes of this EA, an effect is considered adverse if it would alter the integrity of a NRHP-listed or -eligible resource or if it has

the potential to adversely affect traditional cultural properties and the practices associated with the property.

For the Proposed Action, should archaeological deposits inadvertently be discovered during construction, the DAF will follow standard operating procedures for *Discoveries of Archaeological Resources and Native American Graves Protection and Repatriation Act Cultural Items* as detailed in the TAFB Integrated Cultural Resources Management Plan (US Air Force 2021: page 23).

3.6.2.1 Alternative 1: Construct Replacement/New Lift Station

No archaeological resources were identified on the surface during the Phase I intensive survey in the APE. Based on the pedestrian survey and geoarchaeological sensitivity assessment, there is low potential to encounter significant cultural resources during construction. Therefore, Alternative 1 would not physically affect any NRHP-eligible archaeological sites.

Besides the existing lift station, there are no buildings or facilities within the architectural resources APE. The existing lift station, which would be demolished under the Proposed Action, is one element of the wastewater treatment facility that has been determined to be ineligible for inclusion in the NRHP. Further, the two historic-era resources identified within the broader 0.25-mile search area have been determined to be ineligible for inclusion in the NRHP. Therefore, Alternative 1 would have no effect on NRHP-eligible buildings.

No historic properties are present in the APE and a finding of no adverse effect is recommended per 36 CFR § 800.5. Concurrence from the California SHPO with this no adverse effect determination was received on 27 August 2024.

3.6.2.2 No Action Alternative

Under the No Action Alternative, there would be no effect on any cultural resources because there would be no construction or ground-disturbing activities.

3.7 Biological Resources

Biological resources include native or invasive plants and animals; sensitive and protected floral and faunal species; and the habitats, such as wetlands, forests, and grasslands, in which they exist. Habitat can be defined as the resources and conditions in an area that support a defined suite of organisms. The following is a description of the primary federal statutes that form the regulatory framework for the evaluation of biological resources.

Endangered Species Act (ESA). The ESA of 1973 (16 USC § 1531 et seq.) established protection over and conservation of threatened and endangered species and the critical habitat upon which they depend. Sensitive and protected biological resources include plant and animal species listed as threatened, endangered, or special status by the USFWS and the National Marine Fisheries Service. Under the ESA (16 USC § 1536), an “endangered species” is defined as any species in danger of extinction throughout all, or a large portion, of its range. A “threatened species” is defined as any species likely to become an endangered species in the

foreseeable future. The USFWS maintains a list of species considered to be candidates for possible listing under the ESA. The ESA also allows the designation of geographic areas as critical habitat for threatened or endangered species. Although candidate species receive no statutory protection under the ESA, the USFWS has attempted to advise government agencies, industry, and the public that these species are at risk and may warrant protection under the ESA.

Migratory Bird Treaty Act (MBTA). The MBTA of 1918 makes it unlawful for anyone to take migratory birds or their parts, nests, or eggs unless permitted to do so by regulations. Per the MBTA, “take” is defined as “pursue, hunt, shoot, wound, kill, trap, capture, or collect” (50 CFR 10.12). Migratory birds include nearly all avian species in the US, with the exception of some upland game birds and nonnative species.

EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds,* requires all federal agencies undertaking activities that may negatively impact migratory birds to follow a prescribed set of actions to further implement the MBTA. EO 13186 directs federal agencies to develop a Memorandum of Understanding with the USFWS that promotes the conservation of migratory birds.

The National Defense Authorization Act for fiscal year 2003 (Public Law 107-314, 116 Stat. 2458) provided the Secretary of the Interior with the authority to prescribe regulations to exempt the armed forces from the incidental take of migratory birds during authorized military readiness activities. Congress defined military readiness activities as all training and operations of the US armed forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use.

In December 2017, the US Department of the Interior issued M-Opinion 37050, which concluded that the take of migratory birds from an activity is not prohibited by the MBTA when the underlying purpose of that activity is not the take of a migratory bird. However, Solicitor Opinion M-37050 was revoked and withdrawn on 8 March 2021. On 4 October 2021, the USFWS published a final rule to allow the MBTA to be implemented as prohibiting incidental take and applying enforcement discretion, consistent with agency practice prior to 2017.

Bald and Golden Eagle Protection Act (BGEPA). The BGEPA of 1940 (16 USC § 668-668c) prohibits the “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle [or any golden eagle], alive or dead, or any part, nest, or egg thereof.” “Take” is defined as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb," and “disturb” is defined as “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, injury to an eagle, a decrease in productivity by substantially interfering with the eagle’s normal breeding, feeding, or sheltering behavior, or nest abandonment by substantially interfering with the eagle’s normal breeding, feeding, or sheltering behavior.” The BGEPA also prohibits activities around an active or inactive nest site that could result in an adverse impact on the eagle.

3.7.1 Affected Environment

Vegetation. The vegetation communities that occur on TAFB include lacustrine marsh, riparian vegetation, vernal pools, annual grassland, and urban landscapes (TAFB 2022). The vegetation community present at the Proposed Action area is entirely annual grassland. The dominant vegetation in annual grasslands at TAFB includes nonnative, annual, upland species such as soft chess (*Bromus hordeaceus*), Italian ryegrass (*Lolium perennis*), rat tail fescue (*Festuca myuros* var. *myuros*), filaree (*Erodium* spp.), wild oats (*Avena* spp.), ripgut brome (*Bromus diandrus*), and Harding grass (*Phalaris aquatica*). The Proposed Action area is highly disturbed, and vegetation observed also included nonnative grasses, fennel (*Foeniculum vulgare*), black mustard (*Brassica nigra*), Italian thistle (*Carduus pycnocephalus*), and blackberry (*Rubus* sp.).

Wildlife. The grassland habitat proximate to the stormwater conveyance on the south side of TAFB supports numerous birds, reptiles, and small mammals. Dominant representatives include red-winged blackbird (*Agelaius phoeniceus*), killdeer (*Charadrius vociferus*), white-tailed kite (*Elanus leucurus*), western meadowlark (*Sturnella neglecta*), Pacific tree frog (*Pseudacris regilla*), western fence lizard (*Sceloporus occidentalis)*, gopher snake (*Pituophis melanoleucus*), deer mouse (*Peromyscus maniculatus*), and house mouse (*Mus musculus*). Fossorial species occupy grassland habitats and share burrow complexes; species include western burrowing owl (*Athene cunicularia*), California ground squirrel (*Otospermophilus beecheyi*), and California tiger salamander (*Ambystoma californiense*) (TAFB 2022).

Threatened and Endangered Species. Table 3-6 provides the list of federal and state listed species that could potentially occur in the Proposed Action area as described by the USFWS Information for Planning and Consultation database (USFWS 2024) and TAFB Integrated Natural Resources Management Plan (TAFB 2022). Only four federal ESA listed species are known to occur on the Main Base and in TAFB's eight GSUs, which are the Central Valley population of the California tiger salamander, Contra Costa goldfields (*Lasthenia conjugens*), vernal pool fairy shrimp (*Branchinecta lynchi*), and vernal pool tadpole shrimp (*Lepidurus packardi*). There are no verified occurrences of either the conservancy fairy shrimp (*Branchinecta conservatio*) or delta green ground beetle (*Elaphus viridis*) on TAFB or its eight GSUs. The nearest known occurrences for both those species are on the Wilcox Ranch property, located immediately southeast of TAFB. There is no designated critical habitat at the Proposed Action area. The life history of these federally listed species and known occurrences on TAFB are described in the BA (**Appendix C**).

Based on the habitat risk map in the TAFB Programmatic Biological Opinion (PBO), the lift station construction would occur in California tiger salamander High Risk habitat. No wetlands or vernal pools are present within the proposed lift station action area; therefore, there is no habitat for Contra Costa goldfields, vernal pool fairy shrimp, or vernal pool tadpole shrimp in the Proposed Action area. Seasonal wetlands and vernal pools are present within 250 feet of the Proposed Action area and provide habitat that could support vernal pool fairy shrimp, vernal pool tadpole shrimp, and several state-listed Invertebrates of Conservation Priority, including California fairy shrimp (*Linderiella occidentalis*), hairy water flea *(Dumontia oregonensis*), and midvalley fairy shrimp (*Branchinecta mesovallensis*).

Two bat species of listed as state species special concern by the California Department of Fish and Wildlife, the pallid bat (*Antrozous pallidus*) and Townsend's big-eared bat (*Corynorhinus townsendii*), are known to roost in buildings. However, with the building being exposed to the elements and only a canopy to cover the lift station (**Figure 3-4**), it is unlikely the two bat species would roost at this location. Although they could forage over the Proposed Action area, it is highly unlikely that they would ever forage at or near ground level.

Figure 3-4. Photograph of the Existing Travis Air Force Base Lift Station

Table 3-6. Federal and State Special Status Terrestrial Species with the Potential to Occur within the Proposed Action Area

Species	Status		Potential Occurrence within the Proposed Action Area
	USFWS	CDFW	
Invertebrates			
California Fairy Shrimp (*Linderiella occidentalis*)	-	ICP	Potential; known to occur on TAFB; potential to occur in seasonal wetlands and vernal pools within 250 feet of Proposed Action area.
Conservancy Fairy Shrimp (*Branchinecta conservation*)	FE	ICP	None; no verified occurrences at TAFB; no suitable habitat in the Proposed Action area.
Crotch's Bumble Bee (*Bombus crotchii*)	-	ICP	None; species has not been detected on TAFB, and the nonnative grassland habitat is too poor quality to support this species.
Delta Green Ground Beetle (*Elaphrus viridis*)	FT	ICP	Unlikely: no verified occurrences at TAFB; no suitable habitat in the Proposed Action area.
Hairy Water Flea (*Dumontia oregonensis*)	-	ICP	Potential; known to occur on TAFB; potential to occur in seasonal wetlands and vernal pools within 250 feet of Proposed Action area.
Midvalley Fairy Shrimp (*Branchinecta mesovallensis*)	-	ICP	Potential; known to occur on TAFB; potential to occur in seasonal wetlands and vernal pools within 250 feet of Proposed Action area.
Monarch Butterfly (*Danaus plexippus*)	FC	ICP	Unlikely; the grassland habitat does not provide suitable nectaring habitat.
Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)	FT	ICP	Potential; known to occur on TAFB; potential to occur in seasonal wetlands and vernal pools within 250 feet of Proposed Action area.
Vernal Pool Tadpole Shrimp (*Lepidurus packardi)*	FE	ICP	Potential: known to occur on TAFB; potential to occur in seasonal wetlands and vernal pools within 250 feet of Proposed Action area.
Western Bumble Bee (*Bombus occidentalis occidentalis*)	-	ICP	Unlikely; species has not been detected on TAFB, and the grassland habitat is too poor quality to support this species.
Amphibians			
California Red-Legged Frog (*Rana draytonii*)	FT	SSC	None; there are no known occurrences on TAFB or proximate to TAFB.
California Tiger Salamander (*Ambystoma californiense*)	FT	ST	Potential; may occur in burrows and soil cracks in the Proposed Action area.

Species	Status		Potential Occurrence within the Proposed Action Area
	USFWS	CDFW	
Western Spadefoot (*Spea hammondii*)	PFT	SSC	None; there is no suitable habitat in the Proposed Action area and has not been detected on TAFB in surveys.
Reptiles			
Northwestern Pond Turtle (*Actinemys marmorata*)	PFT	SSC	None: species is limited to fully aquatic habitats such as the nearby conveyance ditch.
Birds*			
American White Pelican (*Pelecanus erythrorhynchos*)	-	SSC	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Bald Eagle (*Haliaeetus leucocephalus*)	BGEPA	SE	Unlikely; may fly over the Proposed Action area.
Barrow's Goldeneye (*Bucephala islandica*)	-	SSC	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
California Gull (*Larus californicus*)	-	WL	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Cooper's Hawk (*Accipiter cooperii*)	-	WL	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
California Ridgway's Rail (*Rallus obsoletus obsoletus*)	FT	SE	None; species is limited to wetland habitats typical of coastal environments and not detected on TAFB.
Double-Crested Cormorant (*Phalacrocorax auritus*)	-	WL	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Ferruginous Hawk (*Buteo regalis*)	-	WL	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Golden Eagle (*Aquila chrysaetos*)	BGEPA	WL	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Greater Sandhill Crane (*Grus canadensis*)	-	ST	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.

Species	Status		Potential Occurrence within the Proposed Action Area
	USFWS	CDFW	
Loggerhead Shrike (*Lanius ludovicianus*)	BCC	SSC	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Merlin (*Falco columbarius*)	-	WL	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Northern Harrier (*Circus cyaneus*)	BCC	SSC	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Osprey (*Pandion haliaetus*)	-	WL	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Peregrine Falcon (*Falco peregrinus anatum*)	BCC	FP	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Prairie Falcon (*Falco mexicanus*)	BCC	WL	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Saltmarsh Common Yellowthroat (*Geothlypis trichas sinuosa*)	-	SSC	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Sharp-Shinned Hawk (*Accipiter striatus*)	-	WL	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Short-Eared Owl (*Asio flammeus*)	-	SSC	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Suisun Song Sparrow (*Melospiza melodia maxillaris*)	-	SSC	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over and possibly forage within the Proposed Action area.
Swainson's Hawk (*Buteo swainsonii*)	-	ST	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Tricolored Blackbird (*Agelaius tricolor*)	BCC	ST	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over and forage within the Proposed Action area.

Species	Status		Potential Occurrence within the Proposed Action Area
	USFWS	CDFW	
Western Burrowing Owl (*Athene cunicularia hypogea*)	BCC	SSC	Unlikely; no suitable habitat is present in the Proposed Action area as the nonnative grassland vegetation is likely too tall and dense to support this species.
White-Tailed Kite (*Elanus leucurus*)	-	FP	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area
White-Faced Ibis (*Plegadis chihi*)	-	WL	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Yellow Warbler (*Dendroica petechia*)	BCC	SSC	Unlikely; no suitable habitat is present in the Proposed Action area but may fly over the Proposed Action area.
Mammals			
Pallid Bat (*Antrozous pallidus*)	-	SSC	Potential; could feed over the Proposed Action area.
Townsend's Big-Eared Bat (*Corynorhinus townsendii*)	-	SSC	Potential; could feed over the Proposed Action area.
Western Mastiff Bat (*Eumops perotis*)	-	SSC	Unlikely; no suitable roosting habitat is present in the Proposed Action area but may forage at high altitudes over the Proposed Action area.
Western Red Bat (*Lasiurus blossevillii*)	-	SSC	Unlikely; no suitable roosting habitat is present in the Proposed Action area but may forage over the Proposed Action area.
Fish			
California Roach (*Hesperoleucus symmetricus*)		SSC	None; although known to be present on TAFB, there is no fully aquatic habitat present in the Proposed Action area.
Central Valley Chinook Salmon (*Oncorhynchus tshawytsha*)	FT (Central Valley spring run), FE (Sacramento River winter run), ST (spring run), SE (winter run)		None; although spring-run was potentially found on TAFB during a high flood event in 2017, there is no fully aquatic habitat present in the Proposed Action area.
Plants			
Alkali Milk Vetch (*Astragalus tener* var. *tener*)		CRPR 1B.2	Unlikely; known to occur on TAFB Main Base, but habitat at the Proposed Action area is not suitable.
Brittlescale (*Atriplex depressa*)		CRPR 1B.2	Unlikely; known to occur on TAFB Main Base, but habitat at the Proposed Action area is not suitable.

Species	Status		Potential Occurrence within the Proposed Action Area
	USFWS	CDFW	
Contra Costa Goldfields (*Lasthenia conjugens*)	FE		None; known to occur on TAFB but there is no suitable habitat in the Proposed Action area.
San Joaquin Valley Orcutt Grass (*Orcuttia inaequalis*)	FT		Unlikely; species has not been detected on TAFB during appropriately timed floristic surveys.
Showy Indian Clover (*Trifolium amoenum*)	FE		Unlikely; species has not been detected on TAFB during appropriately timed floristic surveys. Could be present off Main Base on the Railroad GSU.

Sources: TAFB 2022; USFWS 2024
* All avian species are also on the Migratory Bird Treaty Act list
USFWS – US Fish and Wildlife Service; **CDFW** – California Department of Fish and Wildlife; **ICP** – invertebrates of conservation priority; **TAFB** – Travis Air Force Base; **FE** – federal endangered species; **FT** – federal threatened species; **FC** – federal candidate species; **SSC** – State Species of Special Concern; **ST** – state threatened; **PFT** – proposed federal threatened species; **BGEPA** – Bald and Golden Eagle Protection Act; **SE** – state endangered species; **WL** – state watch list species; **BCC –** Bird of Conservation Concern; **FP** – fully protected; **CRPR** – California Rare Plant Rank; **1B.2** – rare throughout their range, declined significantly over the last century, and moderately threatened in California; **GSU** – geographically separated unit

Invasive Species. Most of the vegetation in the Proposed Action area is composed of nonnative and invasive plant species, which are common in disturbed habitats throughout northern California.

3.7.2 Environmental Consequences

To evaluate the potential impacts on the biological resources, the level of impact on biological resources is based on the following:

- Importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource
- Proportion of the resource that would be affected relative to its occurrence in the region
- Sensitivity of the resource to the proposed activities
- Duration of potential ecological ramifications

The impacts on biological resources are adverse if species or habitats of high concern are negatively affected over relatively large areas. Impacts are also considered adverse if disturbances cause reductions in population size or distribution of a species of high concern.

As a requirement under the ESA, federal agencies must provide documentation that ensures that agency actions do not adversely affect the existence of any threatened or endangered species. The ESA requires that all federal agencies avoid “taking” threatened or endangered species (which includes jeopardizing threatened or endangered species habitat). Section 7 of the ESA establishes a consultation process with USFWS that ends with USFWS' concurrence or a determination of the risk of jeopardy from a federal agency project.

3.7.2.1 Alternative 1: Construct Replacement/New Lift Station

The construction of a new lift station and demolition of the existing lift station would have short-term, negligible, adverse impacts on vegetation and wildlife. Approximately 0.7 acre of mostly nonnative vegetation would be directly removed during construction activities. However, there would be no permanent loss of vegetation as a result of the Proposed Action. Following the completion of the lift station construction and demolition activities, disturbed areas would be revegetated with native upland grassland species. Noise from construction equipment and equipment movement could indirectly disturb some relatively common reptile and bird species present in the project area during construction. No breeding habitat for any species would be lost due to the construction of the new lift station.

Preconstruction surveys would be conducted prior to demolition and construction during the months of March through October to identify any active bird nests of migratory birds to ensure chicks or eggs are not taken.

The Proposed Action would have no effects on the conservancy fairy shrimp, the delta green beetle, and the Contra Costa goldfields, because these species are not present in the project area.

Ground-disturbing activities could alter the hydrology, converting a vernal pool or seasonal wetland to a perennial pond, increasing the likelihood of the pond being colonized by predators of the California tiger salamander. Changes in pool or wetland hydrology could expose California tiger salamanders to increased harassment and mortality from predators and possibly lead to their extirpation from a breeding site. The construction of a new lift station and demolition of the old lift station would involve very little change in impermeable surfaces following the completion of all construction activities. The activities associated with the construction of a new lift station may impact California tiger salamanders by displacement or burial. California tiger salamanders could be present in burrows or soil cracks within the action area. All activities that would disturb surface soils would physically destroy existing burrows, soil cracks, and crevices, which may entomb or kill California tiger salamanders that are within them. However, conservation measures described in the BA (**Appendix C**) will be implemented to ensure no surface water hydrological changes would occur, that seasonal breeding sites would not be substantially altered, and to ensure that the potential for injury is reduced to the extent possible.

Vernal pool fairy shrimp and vernal pool tadpole shrimp have not been detected in the seasonal wetland and vernal pools proximate to the lift station project area and the wetland and vernal pools would not be directly impacted by construction activities. However, ground-disturbing activities and increased impermeable surfaces in the watersheds of the wetland and vernal pools could result in siltation of the wetland and pools, and changes in their hydrologic regime. Hydrologic and sedimentation impacts on the seasonal wetland and vernal pools could negatively affect habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp. However, conservation measures described in the BA (**Appendix C**) will be implemented to reduce these potentially adverse impacts.

TAFB completed the BA as defined by the TAFB PBO (USFWS 2018; 08ESMF00-2017-F-2294-3) for routine activities conducted by TAFB for potential impacts on six federally listed species and their habitat (four of which are known to occur on TAFB). TAFB determined that the Proposed Action may affect and is likely to adversely affect the California tiger salamander, vernal pool fairy shrimp, and vernal pool tadpole shrimp. The DAF initiated ESA Section 7 consultation with the USFWS based on the project-specific BA (**Appendix C**) and as outlined in the PBO. The BA (**Appendix C**) identifies proposed avoidance, minimization, or compensation measures intended to avoid or reduce potential impacts of the Proposed Action on federally listed species.

3.7.2.2 No Action Alternative

There would be no construction of a new lift station. Therefore, there would be no construction impacts on biological resources under the No Action Alternative. However, the continued degradation of the existing lift station would create a risk of a future wastewater spill into the stormwater system, and eventually into the stormwater conveyance ditch formally known as Union Creek, where biological resources could be adversely impacted, including sensitive, fully aquatic resources such as the northwestern pond turtle (*Actinemys marmorata*). Although TAFB would continue to take all possible precautions against the lift station failure and a wastewater spill, the risk would be greater than under the Proposed Action. Therefore, there is the potential for long-term, moderate, adverse impacts on biological resources under the No Action Alternative.

3.8 Noise

Noise is often defined as unwanted sound that can interfere with normal activities or otherwise diminish the quality of the environment. Depending on the noise level, it has the potential to disrupt sleep, interfere with speech communication, or cause temporary or permanent changes in hearing sensitivity in humans and wildlife. Noise sources can be continuous (e.g., constant noise from traffic or air conditioning units) or transient (e.g., a jet overflight or an explosion) in nature. Noise sources also have a broad range of frequency content (pitch) and can be nondescript, such as noise from traffic, or be specific and readily definable, such as a whistle or a horn. The way the acoustic environment is perceived by a receptor (animal or person) is dependent on the hearing capabilities of the receptor at the frequency of the noise and the receptor's perception of the noise.

The amplitude of sound is described in a unit called the decibel (dB). Because the human ear hears a broad range of encountered sound pressures, dBs are measured on a quasi-logarithmic scale. The dB scale simplifies this range of sound pressures and allows the measurement of sound to be more easily understood.

There are many methods for quantifying noise, depending on the potential impacts in question and on the type of noise. One useful noise measurement in determining the effects of noise is the one-hour average sound level (L_{eq1H}). The L_{eq1H} can be thought of in terms of *equivalent* sound; that is, if a L_{eq1H} is 45.3 dB, this is what would be measured if a sound measurement device were placed in a sound field of 45.3 dB for one hour. The L_{eq1H} is usually A-weighted

(dBA) unless specified otherwise. A-weighting is a standard filter used in acoustics that approximates human hearing and in some cases is the most appropriate weighting filter when investigating the impacts of noise on wildlife as well as humans. Examples of L_{eq1H} A-weighted noise levels for various common noise sources are shown in **Table 3-7.**

Table 3-7. Comparative A-Weighted Sound Levels

Noise Level (dBA)	Common Noise Levels	
	Indoor	Outdoor
100–110	Rock band inside New York subway	Jet flyover at 1,000 feet
90–100	Food blender at 3 feet	Gas lawnmower at 3 feet
80–90	Garbage disposal at 3 feet	Diesel truck at 50 feet; noisy urban daytime
70–80	Shouting at 3 feet; vacuum cleaner at 10 feet	Gas lawnmower at 100 feet
60–70	Normal speech at 3 feet	Commercial area heavy traffic at 330 feet
50–60	Large business office; dishwasher next room	
40–50	Small theater or large conference room (background)	Quiet urban nighttime
30–40	Library (background)	Quiet suburban nighttime
20–30	Bedroom at night	Quiet rural nighttime
10–20	Broadcast and recording studio (background)	-
0–10	Threshold of hearing	-

Source: Harris 1998
dBA – A-weighted decibel

3.8.1 Affected Environment

The noise associated with TAFB is dominated by aircraft operations, which include the KC-46, C-5, and C-17 permanently based aircraft, and C-130, T-38, B747, E-6, and B767 transient aircraft (US Air Force 2022). **Figure 3-5** shows the baseline day-night average sound level (DNL) noise contours for TAFB plotted in 5 dB increments, ranging from 65 to greater than 80 dBA DNL. The noise contours depict operational conditions as outlined in the 2022 Air Installation Compatible Use Zones Study for TAFB (US Air Force 2022), and there have been no substantial changes in operations or mission since they were developed. The Proposed Action area is in the 75 to 79 dBA DNL noise contour.

3.8.2 Environmental Consequences

Factors considered in determining whether implementing an alternative may have a significant adverse noise impact include the extent or degree to which implementation of an alternative would expose people to noise levels in excess of applicable standards or at levels that may be harmful. All activities associated with the Proposed Action would generate relatively continuous noise throughout demolition, construction, and renovation activities and would then cease after these facility modification activities would be completed.

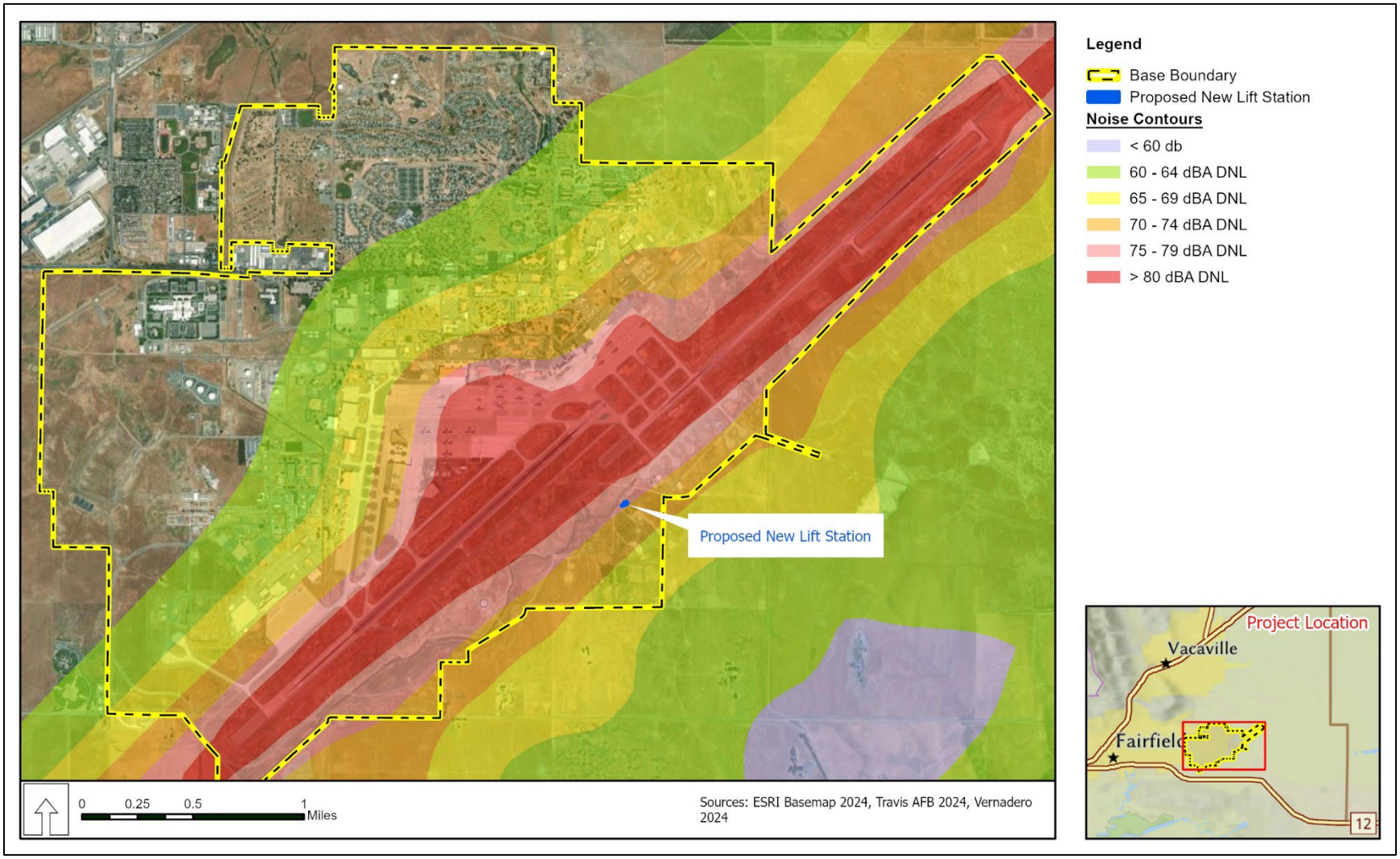

Figure 3-5. Aircraft Operations Noise Contours for Travis Air Force Base

3.8.2.1 Alternative 1: Construct Replacement/New Lift Station

The construction of a new lift station and demolition of the existing lift station within the Proposed Action area would increase noise during project implementation activities. Relatively continuous noise would be generated during construction. These continuous noise levels would be generated by equipment that has source levels (at 3.28 feet) ranging from approximately 70 to 110 dBA. Typical noise levels of heavy construction equipment are presented in **Table 3-8.** Sound levels decrease with greater distances from a sound source, which is called the attenuation rate. Attenuation rates are highly dependent on the terrain over which the sound is passing and the characteristics of the medium in which it is propagating. The rate used in these estimates represents a decrease in sound level of 4.5 dB per doubling of distance. This average rate has been shown to be an accurate estimate from field data on grassy surfaces (Harris 1998).

Table 3-8. Noise Levels of Heavy Construction Equipment

Construction Category and Equipment	Predicted Noise Level at 50 Feet (dBA)
Front End Loader	79-80
Excavator	81-85
Crane	75–87
Dump Truck	76-84

Source: US Department of Transportation 2017
dBA – A-weighted decibel

There would be temporary, minor, adverse, impacts as a result of noise from the proposed construction and demolition activities. At a distance of approximately 500 feet from the construction activities, the predicted maximum noise levels would drop below 65 dBA, a noise level that is equivalent to normal conversation or background music. The proposed project site is not near any off-Base buildings or structures; noise levels would attenuate to at or below 65 dBA within 500 feet of the proposed construction activities, and noise above 65 dBA would remain on Base, further attenuating construction noise to any off-Base receptors. Upon completion of construction, noise from these construction activities would cease. Additionally, the ambient DNL in the Proposed Action area at a distance of 500 feet from the construction activities would be equivalent to or exceed the DNL from construction equipment.

There would be no long-term change in the noise environment from the lift station operations. The noise from the operation of the new lift station, including the use of the emergency backup generator, would be the same as the noise from the operation of the existing lift station.

Construction activities would temporarily increase traffic noise to and from the proposed construction location. Additional traffic noise from vehicles operated by construction workers and transport of construction equipment would be limited to existing roadways that approach TAFB gates and on-Base roadways. Traffic noise would be temporary and would cease at the

end of construction activities. Noise from the increased traffic in support of the construction activities would not be perceptible and would not contribute to off-Base noise increases.

3.8.2.2 No Action Alternative

Under the No Action Alternative, there would be no construction of a new lift station and demolition of the existing lift station. The noise environment would remain unchanged. Therefore, there would be no impacts from noise.

3.9 Infrastructure

Infrastructure consists of the systems and structures that enable a population in a specified area to function. Infrastructure is wholly human made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as developed. The availability of infrastructure and its capacity to support more users and residential and commercial expansion are generally regarded as essential to the economic growth of an area.

The infrastructure components include transportation, utilities, and solid waste management. Transportation is defined as the system of roadways, highways, and transit services that are in the vicinity of the installation and could be reasonably expected to be potentially affected by the Proposed Action. Solid waste management primarily relates to the availability of landfills to support a population's residential, commercial, and industrial needs. Utilities include electrical, natural gas, liquid fuel, water supply, sanitary sewage/wastewater, and communications systems.

3.9.1 Affected Environment

Electrical and Natural Gas. Electrical power is delivered to TAFB by Pacific Gas & Electric Company (PG&E). TAFB uses natural gas as the primary heating fuel, which is furnished by PG&E on a firm as well as on an interruptible basis. Gas consumption at TAFB peaks in the winter months (TAFB no date).

Liquid Fuels. Liquid fuels used at TAFB are Jet A (jet fuel), unleaded gasoline, diesel, and deicing fluid. All other products are delivered by truck. Diesel fuel is used for some standby heating systems, generators, and for vehicles. Kinder Morgan feeds the four aboveground storage tanks (ASTs), which includes two 100,000-barrel tanks and two 50,000-barrel tanks. There is also a 20,000-gallon aboveground diesel tank. Fuel is distributed to aircraft hydrant fueling systems around the flightline (TAFB no date).

Potable Water System. The primary source of potable water at TAFB is through a contract with the City of Vallejo. Raw water is supplied by the North Bay Aqueduct to the city-owned and -operated Vallejo Water Treatment Plant, which has capacity of 6.0 million gallons per day (mgd). The source of water for the North Bay Aqueduct is from the Sacramento River Delta, and the amount of water which may be drawn from this source may be limited in dry years to protect the spawning habitat of the Delta smelt (*Hypomesus transpacificus*), a federal and state listed endangered species (TAFB no date). Potable water storage capacity at the Vallejo Water Treatment Plant is provided by Reservoirs 1 with a capacity of 6.2 million gallons. An additional

600,000-gallon storage tank is located at TAFB's David Grant Medical Center. Four deluge tanks are located near the hangars to provide a dedicated supply for the aircraft hangar fire sprinkler systems. These deluge tanks have a combined capacity of 1.45 million gallons (TAFB no date).

In addition to the contract supply of water, the Base has five active wells, located in a well field at the Cypress Lakes Golf Course, which is a TAFB 200-acre annex approximately 4 miles north of TAFB Main Base. The well field can deliver between 400 and 3,900 gallons per minute (estimated). The maximum available supply of water from these wells is limited to approximately 3.3 mgd by the pipe size from the wells to TAFB. Pumped water is fluoridated and chlorinated at the wellhead, while contract water is filtered and fluoridated at the Vallejo Water Treatment. All water is chlorinated before distribution on TAFB (TAFB no date).

Wastewater System. Domestic sewage wastes are discharged to the sanitary sewer system consisting of over 41 miles of vitrified clay, steel, asbestos, concrete, and plastic gravity sewers and force mains ranging in size from 4 inches in diameter to 2 inches in diameter. There are 10 pump stations in the collection system. Sewage flows to the FSSD sewage treatment facilities The contract between TAFB and the FSSD is based upon an average daily flow of 1.6875 mgd. The average daily flow from TAFB is approximately 1.6 mgd (TAFB no date).

TAFB uses a sewage overflow facility at the former wastewater treatment plant in the southwest corner of TAFB. The overflow facility consists of five basins with a combined capacity of 18.2 million gallons. Three of the basins are used to avoid excess discharge from the system to the FSSD treatment plant during wet weather conditions. After being lifted by the lift station located in Building 1150 (i.e., the Proposed Action area), excess flows are diverted in a diversion box to the storage basin and are stored until peak influent recedes and stored wastewater is returned to the pump station for discharge to the treatment plant. A 90,000-gallon sewage holding tank is located at David Grant Medical Center (TAFB no date).

Solid Waste Management. The management of nonhazardous waste generated at TAFB, during fiscal year 2023 totaled 7,965 tons for the year, including both diverted waste, organic material, and waste sent to a facility. The diverted applications, which include composting, mulching, recycled, and reused materials, totaled 4,439 tons for the year. The amount of municipal solid waste sent to disposal facility totaled 3,526 tons for the year.

Construction and demolition (C&D) debris disposal is cyclic by nature; however, much of C&D debris is recycled or reused, or otherwise diverted from landfills. By weight, concrete composes the largest percentage of the C&D debris generated by most projects. Many regional contractors are using recycled concrete as a supplement to natural aggregates such as crushed stone, sand, and gravel. Old asphalt road pavement and roofing shingles are commonly recycled into aggregate base for new roads. This reduces the regional C&D disposal into landfills.

The Potrero Hills Landfill in Suisun City is the facility used for solid waste disposal. This landfill is a Class III municipal solid waste landfill owned and operated by Waste Connections. It has an estimated operation date of 14 February 2048 with a remaining capacity of 13,872,000 tons (CalWaste 2024).

Communications System. Major communication systems include the distribution systems, voice switching systems, data systems, network control center, flight support systems, long-haul systems, radio systems, video systems, security systems, and other systems. The Network Control Center serves as the primary source for requirements development, implementation management, and troubleshooting for data communications requirements. The flight support systems at TAFB include weather equipment, Navigational Aids, Area Surveillance Radar, and Air Traffic Control Tower. The two main radio systems at TAFB are the ground-to-air radio systems and Land Mobile Radio.

Transportation. Interstates 80, 680, and 505, and California State Route 12 serve TAFB regionally. Interstate 80 extends across the United States, from San Francisco, California, to New York City, New York. Interstate 80 is the primary transportation route into the City of Fairfield from the San Francisco Bay Area to the west and Sacramento to the east. Interstate 505 connects Interstate 80 to Interstate 5 just north of TAFB and provides direct access to northern California, Oregon, and Washington. Interstate 680 connects Interstate 80 near Fairfield to Contra Costa, Alameda, and Santa Clara counties of the Bay Area. State Route 12 is located south of TAFB and serves east-west traffic within Solano County. State Route 12 extends from Napa County to the west to the California Central Valley to the east (**Figure 3-6**).

There are four vehicle gates at TAFB. Peabody Road and Air Base Parkway enter TAFB at the Main Gate where the road becomes Travis Avenue, which is the principal east-west corridor on TAFB. Ragsdale Street extends from Travis Avenue south to the South Gate. The North Gate is serviced by Burgan Boulevard (**Figure 3-6**).

3.9.2 Environmental Consequences

Impacts on infrastructure from the Proposed Action are evaluated for their potential to: disrupt or improve existing levels of service in the ROI, generate additional requirements for energy or water consumption, or affect resources such as sanitary sewer systems. The Proposed Action would result in an adverse impact on utilities or services if the project required more than the existing infrastructure could provide or its required services were in conflict with adopted plans and policies for the area. The effects on transportation and traffic would be considered significant if an alternative resulted in (1) a substantial increase in on- or off-Base traffic or (2) substantial congestion on or around TAFB.

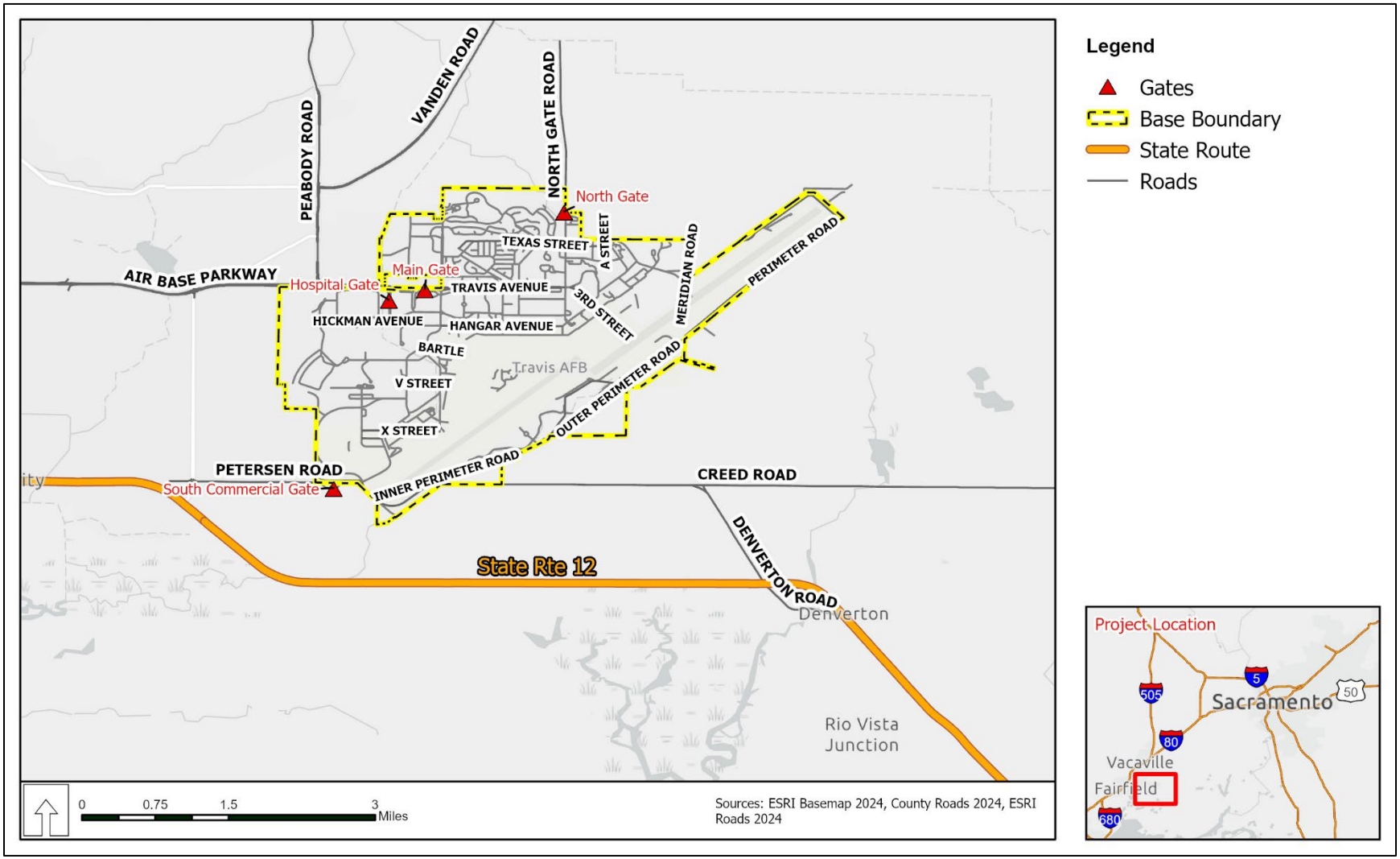

Figure 3-6. Transportation Network for Travis Air Force Base

3.9.2.1 Alternative 1: Construct Replacement/New Lift Station

The construction of a new lift station and demolition of the old lift station would have short-term, negligible, adverse impacts on transportation and solid waste management and long-term, beneficial impacts on wastewater management. There would be no modification or change in the use of TAFB's electric, natural gas, communication distribution, or water and wastewater systems. However, short-term utility interruptions could occur as electric, water, sewer, and sewer lines are removed from the old lift station and connected to the new lift station. There would be no long-term change in TAFB's solid waste management. Some debris and other solid waste would be generated during construction and demolition activities; however, construction debris would be disposed of at the Potrero Hill Landfill, unless the existing lift station has asbestos-containing material (ACM). All construction debris with ACM would be disposed of at the Hay Road Landfill in Vacaville, California. The construction and use of a new lift station would not modify these infrastructure or solid waste systems or place additional strain on their capacity.

The new lift station would extend the life and reduce the maintenance and management of the overall wastewater system at TAFB. The new lift station would more effectively and efficiently move wastewater from TAFB to FSSD for treatment. This would have a long-term benefit to the wastewater infrastructure at TAFB.

There would be increased vehicle traffic at the TAFB gates during construction and demolition activities. This would include privately owned vehicles used by construction workers, as well as trucks hauling materials and equipment. This impact on vehicle traffic at the TAFB gates would be limited to the period of construction and would cease at the end of construction activities.

3.9.2.2 No Action Alternative

Under the No Action Alternative, there would be no construction of a new lift station at TAFB. Therefore, there would be no construction-related impacts on infrastructure at TAFB. However, the continued degradation of the existing lift station would create a risk of a future sanitary sewer system failure at TAFB, which would also impact the ability to utilize the potable water system. Although TAFB would continue to take all possible precautions against the lift station failure, the risk would be greater than under the Proposed Action. Therefore, there is the potential for long-term, moderate, adverse impacts on wastewater and potable systems at TAFB under the No Action Alternative.

3.10 Health and Safety

A safe environment is necessary to prevent or reduce the potential for death, serious injury and illness, or property damage. Safety and human health issues address workers' safety and health during construction, as well as employee safety during the daily operations of the facilities. The purpose of the Occupational Safety and Health Administration's (OSHA's) program is to protect personnel from occupational deaths, injuries, or illnesses; OSHA safety guidance published in the Department of Labor 29 series CFR governs general safety requirements relating to general industry practices (Section 1910), construction (Section 1926),

and elements for federal employees (Section 1960). These standards include guidance for entry into areas where a hazard may exist.

Air Force Instruction (AFI) 91-202, *Air Force Mishap Prevention Program*, and AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*, implement Air Force Policy Directive 91-2, *Safety Programs.* AFI 91-202 establishes mishap prevention program requirements, assigns responsibilities for program elements, and contains program management information. The purpose of the DAF Mishap Prevention Program is to minimize loss of DAF resources and to protect DAF personnel from occupational deaths, injuries, or occupational illnesses by managing risks on and off duty. AFI 91-203 consolidates all DAF Occupational Safety and Health standards and defines the DAF's minimum safety, fire protection, and occupational health standards, and assigns responsibilities to individuals or functions to help Commanders manage their safety and health programs to ensure they comply with OSHA and DAF guidance. These instructions apply to all DAF activities.

3.10.1 Affected Environment

Daily flight and training activities and maintenance operations conducted on TAFB are performed in accordance with applicable DAF safety regulations, DAF technical guidance, and the standards stipulated in DAF Occupational Safety and Health requirements. Construction and demolition activities are common on TAFB and have associated inherent risks such as chemical (e.g., asbestos, lead, hazardous materials) and physical (e.g., noise propagation, falling, electrocution, collisions with equipment) sources. Companies and individuals contracted to perform construction activities on DAF installations are responsible for adhering to OSHA requirements to mitigate these hazards. Industrial hygiene programs address exposure to hazardous materials, use of personal protective equipment, and the availability and use of safety data sheets, the latter of which are also the responsibility of construction contractors to provide to workers. Federal civilian and military personnel that have a need to enter areas under construction should be familiar with and adhere to OSHA and DAF Occupational Safety and Health requirements, as well as applicable industrial hygiene programs. Individuals tasked to operate and maintain equipment, such as power generators, are responsible for following all applicable technical guidance, as well as adhering to established OSHA and DAF safety guidelines.

Health and safety hazards can be identified and subsequently reduced or eliminated before an activity begins. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself, together with the exposed population. The degree of exposure to hazards depends primarily on the proximity of the hazard to the population. Hazards include transportation, maintenance, and repair activities; noise; and fire. The proper operation, maintenance, and repair of vehicles and equipment are important for reducing safety risks. Any facility or human-use area with potential explosive or other rapid oxidation process creates unsafe environments due to noise and fire hazards for nearby populations. Noise environments can also mask verbal or mechanical warning signals such as horns and sirens.

3.10.2 Environmental Consequences

Impacts that pose a long-term risk to human health or safety are evaluated. Impacts would be considered significant if federal civilian, military, or contractor personnel did not comply with established OSHA and DAF safety guidelines. There are potential health and safety concerns with proposed construction and demolition activities.

The health and safety of on-site military and civilian workers are safeguarded by numerous Department of Defense (DoD) and military-branch-specific requirements designed to comply with standards issued by federal OSHA, USEPA, and state occupational safety and health agencies. These standards specify health and safety requirements, the amount and type of training required for workers, the use of personal protective equipment, administrative controls, engineering controls, and permissible exposure limits for workplace stressors.

3.10.2.1 Alternative 1: Construct Replacement/New Lift Station

There would be short-term, negligible, adverse impacts on health and safety as a result of the construction of a new lift station and demolition of the existing lift station at TAFB. Construction activities inherently pose increased health and safety risks to workers, military personnel, or the public. However, all construction personnel would be responsible for following federal and state safety regulations and DoD and OSHA safety standards and would be required to conduct construction activities in a manner that does not increase risk to workers, military personnel, or the public.

3.10.2.2 No Action Alternative

There would be no construction of a new lift station under the No Action Alternative. Therefore, there would be no change in health and safety risks to workers, military personnel, or the public.

3.11 Hazardous Materials, Hazardous Wastes, Environmental Restoration Program, and Toxic Substances

Hazardous Materials and Wastes. The Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act and the Toxic Substances Control Act, defines hazardous materials. Hazardous materials are defined as any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that might cause an increase in mortality, serious irreversible illness, or incapacitating reversible illness, or that might pose a substantial threat to human health or the environment. OSHA is responsible for enforcement and implementation of federal laws and regulations pertaining to worker health and safety under 29 CFR 1910. OSHA also includes the regulation of hazardous materials in the workplace and ensures appropriate training in their handling.

The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (RCRA), which was further amended by the Hazardous and Solid Waste amendments, defines hazardous wastes. Hazardous waste is defined as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes, that pose a substantial present or potential

hazard to human health or the environment. In general, both hazardous materials and hazardous wastes include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, might present substantial danger to public health and welfare or the environment when released or otherwise improperly managed.

Air Force Policy Directive 32-70 establishes the policy that the DAF is committed to the following:

- Cleaning up environmental damage resulting from its past activities
- Meeting all environmental standards applicable to its present operations
- Planning its future activities to minimize environmental impacts
- Responsibly managing the irreplaceable natural and cultural resources it holds in public trust
- Eliminating pollution from its activities wherever possible

Air Force Manual (AFMAN) 31-1067, *Water and Fuel Systems*, implements Air Force Policy Directive 32-70 and identifies compliance requirements for underground storage tanks (USTs), and ASTs, and associated piping that store petroleum products and hazardous substances. Evaluation of hazardous materials and hazardous wastes focuses on USTs and ASTs, as well as the storage, transport, and use of pesticides, fuels, oils, and lubricants. Evaluation might also extend to generation, storage, transportation, and disposal of hazardous wastes when such activity occurs at or near the project site of a proposed action. In addition to being a threat to humans, the improper release of hazardous materials and hazardous wastes can threaten the health and well-being of wildlife species, botanical habitats, soil systems, and water resources. In the event of the release of hazardous materials or hazardous wastes, the extent of contamination varies based on type of soil, topography, weather conditions, and water resources.

AFMAN 32-7002, *Environmental Compliance and Pollution Prevention*, establishes procedures and standards that govern management of hazardous materials throughout the DAF. It applies to all DAF personnel who authorize, procure, issue, use, or dispose of hazardous materials, and to those who manage, monitor, or track any of those activities.

Through the Environmental Restoration Program (ERP), initiated in 1980, a subcomponent of the Defense ERP that became law under the Superfund Amendments and Reauthorization Act (formerly the Installation Restoration Program), each DoD installation is required to identify, investigate, and clean up hazardous waste disposal or release sites. Remedial activities for ERP sites follow the Hazardous and Solid Waste Amendment of 1984 under the RCRA Corrective Action Program. The ERP provides a uniform, thorough methodology to evaluate past disposal sites, control the migration of contaminants, minimize potential hazards to human health and the environment, and clean up contamination through a series of stages until it is decided that no further remedial action is warranted.

The description of ERP activities provides a useful gauge of the condition of soils, water resources, and other resources that might be affected by contaminants. It also aids in

identification of properties and their usefulness for given purposes (e.g., to complete remediation, activities that are dependent on groundwater usage might be foreclosed where a groundwater contaminant plume remains).

Toxic substances might pose a risk to human health but are not regulated as contaminants under the hazardous waste statutes. Included in this category are ACMs, lead-based paint (LBP), radon, and polychlorinated biphenyls (PCBs). The presence of special hazards or controls over them might affect, or be affected by, a proposed action. Information on special hazards describing their locations, quantities, and condition assists in determining the significance of a proposed action.

ACM. AFI 32-1001, *Civil Engineer Operations*, provides the direction for asbestos management at Air Force installations. This instruction incorporates by reference applicable requirements of 29 CFR 669 et seq., 29 CFR 1910.1025, 29 CFR 1926.58, 40 CFR 61.3.80, Section 112 of the CAA, and other applicable AFIs and DoD directives. AFI 32-1052 requires bases to develop an Asbestos Management Plan to maintain a permanent record of the status and condition of ACMs in installation facilities, as well as documenting asbestos management efforts. In addition, the instruction requires installations to develop an Asbestos Operating Plan detailing how the installation accomplishes asbestos-related projects. Asbestos is regulated by the USEPA with the authority promulgated under OSHA, 29 USC § 669 et seq. Section 112 of the CAA regulates emissions of asbestos fibers to ambient air. USEPA policy is to leave asbestos in place if disturbance or removal could pose a health threat.

Lead-Based Paint (LBP). Human exposure to lead has been determined to be an adverse health risk by agencies such as OSHA and the USEPA. Sources of exposure to lead are dust, soils, and paint. In 1973, the Consumer Product Safety Commission established a maximum lead content in paint of 0.5 percent by weight in a dry film of newly applied paint. In 1978, under the Consumer Product Safety Act (Public Law 101-608, as implemented by 16 CFR 1303), the Consumer Product Safety Commission lowered the allowable lead level in paint to 0.06 percent (600 parts per million [ppm]). The act also restricted the use of LBP in nonindustrial facilities. The DoD implemented a ban of LBP use in 1978; therefore, it is possible that facilities constructed prior to or during 1978 may contain LBP.

Radon. Radon would not be a concern associated with the construction and use of a wastewater lift station at TAFB. The lift station would not be a facility that would house workers for any length of time that would have radon exposure concerns. Therefore, radon is not discussed further.

Polychlorinated Biphenyls (PCBs). PCBs are a group of chemical mixtures used as insulators in electrical equipment, such as transformers and fluorescent light ballasts. Chemicals classified as PCBs were widely manufactured and used in the US until they were banned in 1979. The disposal of PCBs is regulated under the federal Toxic Substances Control Act (15 USC § 2601, et seq., as implemented by 40 CFR 761), which banned the manufacture and distribution of PCBs, with the exception of PCBs used in enclosed systems. Per DAF policy, all installations

should have been PCB free as of 21 December 1998. In accordance with 40 CFR 761 and DAF policy, both of which regulate all PCB articles, PCBs are regulated as follows:

- Less than 50 ppm – non-PCB (or PCB free)
- 50 ppm to 499 ppm – PCB contaminated
- 500 ppm and greater – PCB equipment

The Toxic Substances Control Act regulates and the USEPA enforces the removal and disposal of all sources containing 50 ppm or more of PCBs; the regulations are more stringent for PCB equipment than for PCB-contaminated equipment.

3.11.1 Affected Environment

Hazardous Materials. Hazardous and toxic material procurements at TAFB are approved and tracked by the TAFB 60th Civil Engineer Squadron, Installation Management Flight, Environmental Management Element (60 CES/CEIE), which has overall management responsibility of the installation environmental program. The Bioenvironmental Engineering Flight supports and monitors environmental permits, hazardous materials, and hazardous waste storage, spill prevention and response, and participation in the Environmental Safety and Occupational Health Council (ESOHC) (US Air Force 2019).

The ESOHC is a network of safety, environmental, and logistics experts who work with hazardous materials managers, unit environmental coordinators, and other hazardous materials users to ensure safe and compliant hazardous materials management throughout the base. A privately contracted hazardous material pharmacy (HAZMART) ensures that only the smallest quantities of hazardous materials necessary to accomplish the mission are purchased and used.

The 60 CES/CEIE maintains the Hazardous Waste Management Plan (US Air Force 2019) as directed by AFMAN 32-7002, *Environmental Compliance and Pollution Prevention,* and complies with 40 CFR 260 to 272. This plan prescribes the roles and responsibilities of all members of the ESOHC with respect to the waste stream inventory, Waste Analysis Plan, hazardous waste management procedures, training, emergency response, and pollution prevention. The Hazardous Waste Management Plan establishes the procedures to comply with applicable federal, state, and local standards for solid waste and hazardous waste management. The plan outlines procedures for transport, storage, and disposal of hazardous wastes.

Hazardous materials and petroleum products such as fuels, flammable solvents, paints, corrosives, pesticides, deicing fluid, refrigerants, and cleaners are used throughout TAFB for various functions, including aircraft maintenance, aircraft ground equipment maintenance, ground vehicle communications infrastructure, and facilities maintenance. Hazardous materials at TAFB are managed by the HAZMART. The Enterprise ESOHC Management Information System tracks acquisition and inventory control of hazardous materials for units based at TAFB.

Hazardous Waste. Hazardous wastes generated at TAFB include flammable solvents, contaminated fuels and lubricants, paint/coating, stripping chemicals, oils, paint-related materials, mixed solid waste, and other miscellaneous wastes. Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called "universal wastes," and their associated regulatory requirements are specified in 40 CFR 273. Types of waste currently covered under the universal waste regulations include fluorescent light tubes, hazardous waste batteries, hazardous waste thermostats, and hazardous waste lamps.

Facilities at TAFB generate varying amounts of hazardous waste as a large-quantity generator as defined by the USEPA (40 CFR 260.10). TAFB operates four types of accumulation areas: daily empty sites, satellite accumulation points, 90-day storage yards (Buildings 793 and 831), and the RCRA-permitted one-year Hazardous Waste Storage Facility in Building 1365. TAFB operates one 90-day central accumulation point, where hazardous waste accumulates before being transported off TAFB for ultimate disposal (US Air Force 2019). None of the facilities in the ROI contain satellite accumulation points.

Fuel is stored in USTs and ASTs. There are seven aboveground bulk storage tanks with a capacity of almost 7 million gallons that distribute fuel to six aircraft hydrant systems around the flightline. Associated with the hydrant fueling system are 21 USTs and two ASTs with a combined capacity of almost 19 million gallons (TAFB no date).

Environmental Restoration Program/Military Munitions Response Program. Air Force Civil Engineer Center Installation Support Team (AFCEC/CZOW) ERP remediates all accident, disposal, and spill sites (from 1984 or earlier) that may pose an immediate or potential threat to public health, welfare, or the environment. There are numerous ERP sites on Base; soil and groundwater cleanup sites include landfills, fire protection training areas, spill sites, waste disposal sites, drum storage areas, leaking USTs and piping, oil/water separators, waste treatment plants, and other areas (TAFB 2022).

The ERP operates three groundwater treatment plants under the authority of two Interim Groundwater Records of Decision signed with the USEPA, Department of Toxic Substances Control, and the San Francisco Bay Regional Water Quality Control Board. Each treatment plant extracts contaminated groundwater from principally trichloroethylene-contaminated shallow groundwater plumes underneath TAFB and, after treatment, discharges the water to the North Gate Pond or stormwater conveyance ditch. The influent and effluent are both tested at the treatment plants to ensure all contaminants are remediated below regulatory thresholds prior to discharge (TAFB 2022).

The Proposed Action area is proximate to several ERP sites but only overlaps with one of site, ERP Site OT010, STP Sludge Disposal Area (**Figure 3-7**). The former Sludge Disposal Area is located at an inactive sewage treatment plant between stormwater conveyance ditch and multiple oxidation ponds. Metals and total petroleum hydrocarbons have been detected in the soil and may be a source of potential and ecological risks. The *North/East/West Industrial Operable Unit Soil, Sediment and Surface Water Record of Decision* selected No Action to

address the soil contaminants at this site. Since there are no other media of concern, ERP Site OT010 is effectively closed for budgeting and programming purposes (TAFB 2024a).

The Proposed Action area is proximate to ERP Site FT005, Fire Training Area #4 (**Figure 3-7**) and its associated groundwater monitoring wells. FT005 was used for fire training exercises from 1962 to approximately 1988. From 1962 until the early 1970s, waste fuels, oils, and solvents were burned at the site during training exercises. Only fuels were burned from the early 1970s until the training area was closed. The primary groundwater contaminant is 1,2-dichloroethene. Contaminated groundwater from this training area has migrated 1,800 feet beyond the south base boundary. Metals, total petroleum hydrocarbons (TPHs), and polynuclear aromatic hydrocarbons (PAHs) were also detected in the soil, which posed potential human health and ecological risks. The plume of contaminated groundwater was fully encapsulated in June 2002 and is being pumped back to TAFB and treated at the South Base Boundary Groundwater Treatment Plant. Based on human health and ecological assessments of the potential risks posed by the soil contaminants, the *North/East/West Industrial Operable Unit Soil, Sediment, and Surface Water Record of Decision* selected excavation for the soil at this site, and TAFB carried out the first part of a soil cleanup action at FT005 in 2007. The excavation of PAH-contaminated soil was completed in 2012 (TAFB 2024b).

Toxic Substances. Toxic substances might pose a risk to human health but are not regulated as contaminants under the hazardous waste statutes. Included in this category are ACM, LBP, and PCBs. Asbestos has not been used in construction materials after 1989, and lead has not been used as an additive to paints and pigment since 1978. However, the lift station building was constructed prior to 1978 and could contain ACM, LBP, or PCBs.

3.11.2 Environmental Consequences

Impacts on hazardous materials management would be considered adverse if the federal action resulted in noncompliance with applicable federal and state regulations, or increased the amounts generated or procured beyond current waste management procedures and capacities at the Installation. Impacts on the ERP would be considered adverse if the federal action disturbed (or created) contaminated sites, resulting in negative effects on human health or the environment.

3.11.2.1 Alternative 1: Construct Replacement/New Lift Station

Hazardous Materials and Wastes. There would be a short-term, negligible, adverse impact on hazardous materials and wastes due to the construction of a new lift station and demolition of the old lift station. The quantity of hazardous materials such as POLs used in vehicles and equipment would increase on TAFB during construction. However, all hazardous materials required for construction and demolition operations would be properly tracked and maintained, and only the smallest quantities necessary to support construction would be used. Further, all hazardous waste generated as a result of construction activities would be disposed of properly and in accordance with federal, state, and local regulations. Following the hazardous materials management and hazardous waste disposal requirements during construction activities would ensure the proper handling of hazardous materials and disposal of hazardous wastes.

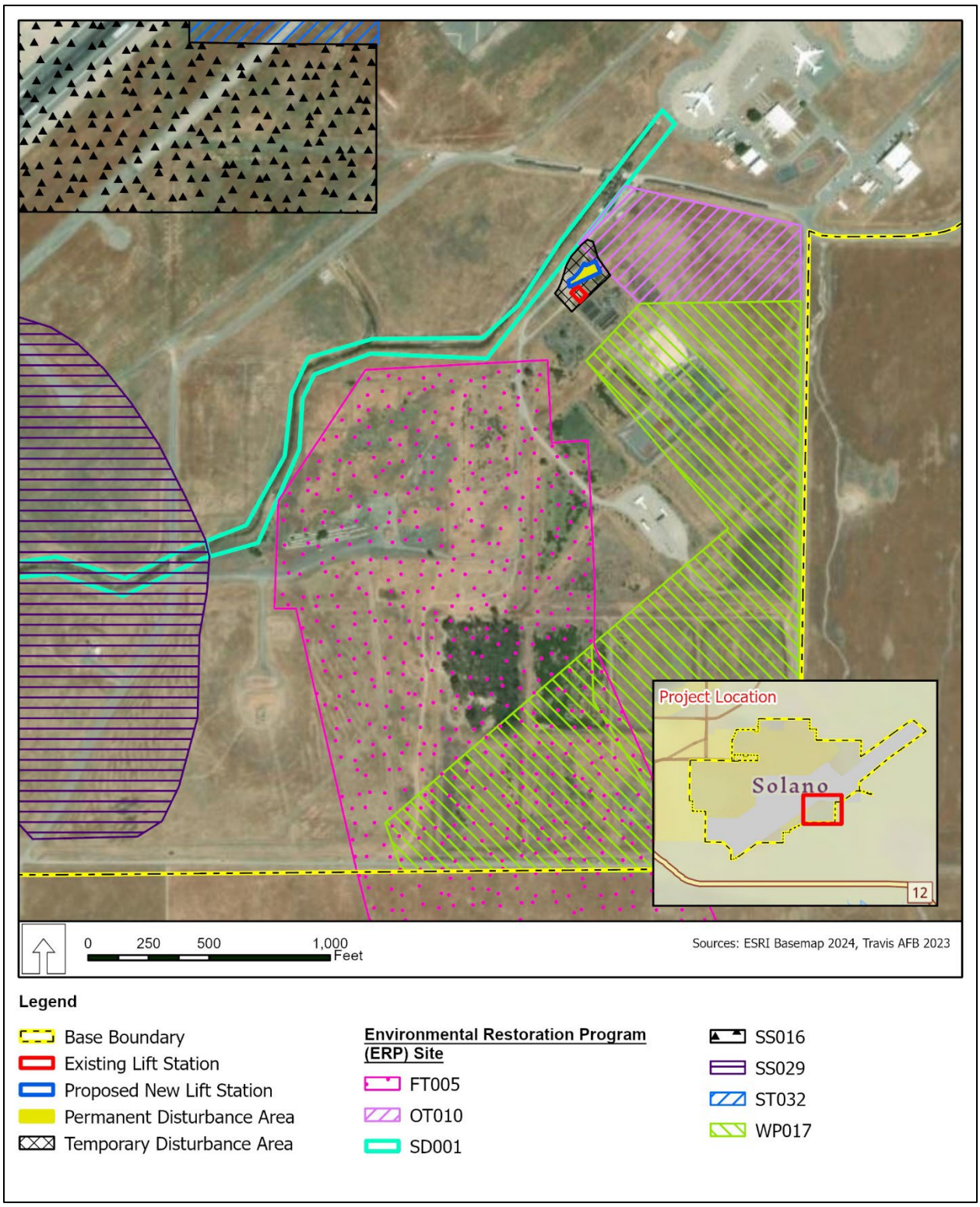

Figure 3-7. Environmental Restoration Program Sites Proximate to the Proposed Lift Station

Environmental Restoration Program. There is one active ERP Site, Site FT005, that has associated monitoring wells near the proposed project site and one closed ERP site, Site OT010, that overlaps the proposed project area (**Figure 3-7**). Site 0T010 is closed, and no other remedial activities are occurring at this site although potential soil contaminants remain present. Impacts on Site OT010 would not be expected as all contaminated soils and groundwater would be avoided during demolition and construction activities. Active monitoring wells for ERP Site FT005 will be avoided by construction workers. The construction activities will not destroy or cover these active monitoring wells with soil, debris, or equipment of any kind. Access to these monitoring wells will be maintained during all lift station demolition and construction activities. Further, prior to the disturbance of any potentially affected soils, a TAFB dig permit will trigger ERP review of the ERP sites. The review will determine the steps to be taken at the construction location to avoid contaminated groundwater and soils, avoid damage or access restrictions to monitoring wells, and whether or not the project area qualifies for a waiver.

Before construction begins, construction workers would be informed of the potential presence of hazardous constituents in soils. Construction workers would also be provided material safety data sheets and descriptions of safe work practices, including the use of personal protective equipment. Should contaminated soils be removed, transported, treated, and/or disposed of, RCRA regulations would apply to the characterization, transportation, and disposal of this material.

No per- and polyfluoroalkyl substances (PFAS) contamination has been identified proximate to the proposed lift station. If PFAS contamination is discovered, a Media Management Plan would be developed and implemented to remediate any PFAS-contaminated solid or aqueous media prior to construction.

Toxic Substances. There is the potential for short-term, minor, adverse impacts from ACM, LBP, and PCBs encountered during the demolition of the existing lift station. However, ACM and LBP sampling would be conducted prior to demolition activities, and if determined to be present, ACM and LBP would be properly handled and disposed of in accordance with federal, state, and local laws during demolition activities. All PCBs encountered would also be handled and disposed of in accordance with federal, state, and local laws.

3.11.2.2 No Action Alternative

The new lift station would not be constructed, and the old lift station would not be demolished under the No Action Alternative. Therefore, there would be no construction or demolition-related impacts on hazardous materials and wastes, ERP sites, or from toxic substances.

3.12 Socioeconomics – Income and Employment

Socioeconomics is the relationship between economics and social elements, such as population levels and economic activity. Several factors can be used as indicators of economic conditions for a geographic area, such as demographics, median household income, unemployment rates, percentage of families living below the poverty level, employment, and housing data. Data on employment identify gross numbers of employees, employment by industry or trade, and

unemployment trends. Data on industrial, commercial, and other sectors of the economy provide baseline information about the economic health of a region.

3.12.1 Affected Environment

The population of Solano County, California, was 449,218 in the 2023 US census. This was 8 percent more than the 2010 US census population estimated for Solano County (US Census Bureau 2024). The state of California's population totaled 39,965,193 in 2023, which was a 6.8 percent increase over the 2010 US census population of the state. The population growth rate of Solano County was slightly more than the growth rate for the state of California. The rate of growth for Solano County was similar to that of the US (**Table 3-9**).

Table 3-9. Population in the Travis Air Force Base Region of Influence as Compared to California and the United States (2010 – 2023)

Location	2010	2023	Percent Change (2010 – 2023)
United States	308,745,538	334,914,895	7.8
California	37,253,956	39,965,193	6.8
Solano County	413,344	449,218	8.0

Source: US Census Bureau 2024

The median income of Solano County in 2022 was $97,037. The median income of Solano County was slightly higher than the state of California at $91,905 and substantially higher than the US at $75,149 (US Census Bureau 2024). The unemployment rate for Solano County was 4.7 percent in 2023. This was similar to the unemployment rate of 4.8 percent for California; both Solano County and California had higher unemployment rates in 2023 than the US, which was 3.6 percent (US Bureau of Labor Statistics 2024).

A total of 7,276 active duty and 2,664 reserve military personnel are stationed at TAFB and another 2,924 civilian personnel work there. The total annual payroll is estimated to be approximately $1.06 billion, and the total economic impact to the state of California is estimated to be $2.2 billion (TAFB 2019).

3.12.2 Environmental Consequences

Consequences to socioeconomic resources were assessed in terms of the potential impacts on the local economy from the Proposed Action, as there is no population living within the vicinity of this project. The level of impacts associated with construction expenditure is assessed in terms of direct effects on the local economy and related effects on other socioeconomic resources (e.g., housing, employment, community resources). The magnitude of potential impacts can vary greatly, depending on the location of an action. For example, implementation of an action that creates 10 employment positions might be unnoticed in an urban area, but it might have significant impacts in a rural region.

In addition, if potential socioeconomic changes resulting from other factors were to result in substantial shifts in population trends or in adverse effects on regional spending and earning patterns, they may be considered adverse.

3.12.2.1 Alternative 1: Construct Replacement/New Lift Station

Additional materials and labor for the proposed new lift station construction and existing lift station demolition would have a short-term, minor, beneficial impact on the socioeconomic condition of the region. There would be increased expenditures in the region during these construction activities, but expenditures, such as increased payroll tax revenue and the purchase of additional equipment, materials, and fuel, would cease at the end of construction.

3.12.2.2 No Action Alternative

Under the No Action Alternative, there would be no construction of a new lift station. Therefore, there would be no construction-related impacts on socioeconomics. However, the continued degradation of the existing lift station would create a risk of a future sanitary sewer system failure at TAFB, which could impact the mission at TAFB. Although TAFB would continue to take all possible precautions against the lift station failure, the risk would be greater than under the Proposed Action. Therefore, there is the potential for long-term, moderate, adverse impacts on socioeconomics in the region if there is a mission-related stoppage of operations due to the lack of an operable sanitary sewer system at TAFB under the No Action Alternative.

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4.0 REASONABLY FORESEEABLE ACTIONS AND CUMULATIVE IMPACTS

The effects of cumulative impacts (as required in 40 CFR §1508.7) and concurrent actions (as required in 40 CFR §1508.25[1]) are also evaluated for each resources area. A cumulative impact, as defined by the CEQ (40 CFR §1508.7) is the "…impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or nonfederal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

4.1 Past, Present, and Reasonably Foreseeable Actions

Table 4-1 provides a list of the reasonably foreseeable future actions that could interact with the Proposed Action and that were considered when evaluating potential cumulative impacts of the action alternatives.

Table 4-1. Reasonably Foreseeable Future Actions

Project	Project Summary	Anticipated Implementation Date	Relationship to Proposed Action
Travis Air Force Base Future Actions			
Repair South Gate Search Wall and Drainage Points at Traffic Check	Project would make repairs at the South Gate, used for commercial traffic.	2025	Noise, air quality, health and safety, earth resources
Repair Foam Fire Suppression Systems, Hangar B14	Project would repair the foam fire suppression systems.	2026	Noise, water resources, biological resources, earth resources, hazardous materials and waste
Invasive Species Management Environmental Assessment	Project is proposed to control invasive species on Travis AFB. An EA has been developed to evaluate the impacts of implementing those methods.	2025	Water resources, earth resources, biological resources, hazardous materials and waste
Reconstruction of Runway 21R/03L	Full reconstruction of Runway 21R/03L would be carried out to include all facilities inside the hold lines, including pavements, pavement markings, storm drainage, and airfield lights and signs.	2026	Noise, water resources, infrastructure, biological resources, earth resources, health and safety, socioeconomics

Project	Project Summary	Anticipated Implementation Date	Relationship to Proposed Action
Other Future Actions			
California Forever	A proposed long-term development of lands between TAFB and Rio Vista that could accommodate up to 400,000 new residents.	2028	Noise, air quality, water resources, earth resources, infrastructure, biological resources, cultural resources, socioeconomics
Highway 12 Logistics Center	Proposed construction of 1.2 million square feet of new industrial space south of State Route 12 and north of Cordelia Road. Six new buildings would be constructed in multiple phases. Land would be annexed to the Suisun City.	2028	Noise, water resources, earth resources, infrastructure, biological resources, socioeconomics
Recology Hay Road Landfill Expansion	Proposed project would expand the existing landfill onto adjacent undeveloped land.	2027	Air quality, water resources, earth resources, biological resources, socioeconomics
PG&E Bay Area Operations and Maintenance 30-Year Plan	Proposed long-term operations and maintenance and minor new construction for natural gas and electric lines in the San Francisco Bay Area, including Solano County.	2025	Air quality, biological resources, socioeconomics, health and safety
Solano Interstate 80 Express Lanes	Caltrans and the Solano Transportation Authority are adding express lanes on Interstate 80 between Red Top Road and Leisure Town Road.	Ongoing	Transportation, air quality, noise, socioeconomics

AFB – Air Force Base; **EA** – Environmental Assessment; **TAFB** – Travis Air Force Base; **PG&E** – Pacific Gas & Electric; **Caltrans** – California Department of Transportation

4.2 Assessment of Cumulative Impacts by Resource

4.2.1 Air Quality, Climate Change, and Greenhouse Gases

The proposed lift station construction in addition to the reasonably foreseeable future actions listed in **Table 4-1** would result in additional impacts on air quality. The proposed construction projects on TAFB would increase fugitive dust and other criteria pollutant emissions during the construction activities; however, these increases would be temporary and localized. Thus, the

potential incremental impact on air quality would be negligible, and cumulative impact on air quality would not be significant.

The proposed off-Base projects (not associated with DoD), including California Forever, the Highway 12 Logistics Center, and PG&E Bay Area Operations and Maintenance 30-Year Plan, would have long-term cumulative impacts on regional air quality from increased fugitive dust emissions during construction and increased vehicle emissions from additional vehicles from residents and workers. An additional 400,000 new residents in the region would also contribute to increased GHG emissions, although the State of California has progressively reduced GHG emissions even as the state's population has increased and would be likely to continue to do so in the future.

4.2.2 Water Resources

The Proposed Action in combination with other proposed projects on TAFB and the off-Base highway utility maintenance and construction projects would cumulatively adversely impact surface water and groundwater quality from sedimentation and transport of POLs from construction equipment in stormwater. However, the proposed lift station, in combination with other reasonably foreseeable construction projects on TAFB, would all be subject to the TAFB SWPPPs, including the implementation of BMPs to protect surface water.

However, with the completion of these various proposed construction projects at TAFB in combination with other off-Base projects such as California Forever, there would be more impervious surface area increasing the rate of stormwater discharge into the nearby conveyance ditch, other surface water bodies, surrounding wetlands, and Suisun Bay, during rain events. Wetlands and other surface water bodies would likely be protected by existing laws and regulations from direct dredge and fill activities during construction. However, their surface water quality could be degraded from stormwater runoff from new impermeable surfaces. Therefore, the Proposed Action in combination with other proposed construction projects would have long-term, adverse, cumulative impacts on water resources.

4.2.3 Soils

The Proposed Action in combination with other projects proposed at TAFB as well as off-Base road repair and utility maintenance projects would have a long-term, minor, cumulative impact on soils from soil disturbance during construction activities and increased impermeable surfaces. Increased runoff rates during stormwater events could increase soil erosion and sediment transport. However, all projects proposed at TAFB would be subject to BMPs as described by the projects' SWPPP, which would greatly reduce the likelihood of soil erosion and loss. There would be substantial cumulative impacts on soils from large development projects such as California Forever that would permanently damage surface soils and greatly increase the impermeable surface areas proximate to TAFB. This would lead to a permanent loss of soils, some of which could be Prime Farmland soils.

4.2.4 Cultural Resources

There would be no reasonably foreseeable impacts on cultural resources from the proposed construction of a new lift station and demolition of the existing lift station at TAFB. All reasonably foreseeable projects proposed on TAFB would be subject to Section 106 of the NHPA, and each proposed project would be evaluated to ensure there are no adverse effects on historic properties. Impacts on cultural resources from proposed off-Base highway and utility maintenance and maintenance projects and large development projects such as California Forever could occur; however, those projects would be subject to evaluation under state and federal regulations including the NHPA and the California Environmental Quality Act. Therefore, cumulative impacts on cultural resources are unlikely.

4.2.5 Biological Resources

The Proposed Action, in combination with reasonably foreseeable future actions on and off TAFB, including off-Base road and utility maintenance and construction projects, would potentially result in long-term, minor, cumulative adverse impacts on vegetation and wildlife due to a direct loss of vegetation from construction activities and loss of habitat from the removal of trees and other vegetation. However, there would be negligible impacts on wildlife resources as a result of the Proposed Action. The other proposed projects, such as the proposed California Forever project, would have devastating impacts on sensitive habitats outside of TAFB. The development of large areas of sensitive habitats would have cumulative adverse impacts on federal and state listed species and lead to a loss of sensitive aquatic habitat such as vernal pools, riparian areas, and seasonal wetlands. However, any potential effects on federally listed species from other reasonably foreseeable projects would be evaluated under the ESA. Off-Base projects on local, state, and private lands would also be subject to the requirements of the California ESA. Therefore, with the evaluation of impacts on federal and state listed species through the ESA and California ESA, the implementation of appropriate conservation measures, and the appropriate habitat mitigations, cumulative impacts on sensitive plant and wildlife species would be minimized.

4.2.6 Noise

Noise from the construction and demolition activities associated with the lift station construction in combination with other proposed construction projects on TAFB would have temporary noise impacts that would end when the construction or demolition activities end. There are no sensitive receptors proximate to these proposed construction projects on TAFB that would be affected by these temporary increases in the noise environment. On TAFB, noise levels from all the proposed projects would be similar to or less than the ambient noise levels from aircraft operations.

The proposed California Forever and Highway 12 Logistic Center projects would involve long-term construction proximate to TAFB. These proposed projects would have long-term, cumulative, adverse impacts on noise proximate to TAFB, and could also be impacted by noise from ongoing and unchanged aircraft operations at TAFB.

4.2.7 Infrastructure

Construction and demolition activities associated with the proposed lift station in combination with other reasonably foreseeable infrastructure construction projects at TAFB, as well as off-Base proposed projects, would have long-term, cumulative, adverse impacts on transportation and other utilities, including solid waste management. Assuming the Proposed Action and the other proposed construction projects at TAFB occur simultaneously, there would be an increase in personal vehicles and construction equipment traffic at TAFB gates. Typically, construction worker commutes occur at times that are earlier than both the morning and afternoon commute times, reducing some of the potentially adverse impacts this vehicular traffic would have at the TAFB gates. When these construction activities cease, so would the associated increase in vehicular traffic. However, with a potential increase of 400,000 new residents adjacent to TAFB from the proposed California Forever project, transportation in the region would experience cumulative adverse impacts, including on roadways proximate to TAFB gates.

Additionally, all of these on-Base and off-Base construction projects would generate C&D debris that would adversely impact solid waste management. The local landfills that accept C&D materials have the capacity to handle any excess TAFB debris that cannot be reused on the Base for other projects. Regardless, the large volume of additional debris brought to the landfill from other construction projects such as California Forever would have a cumulative impact on landfill management regionally.

All other Base infrastructure has adequate capacity to handle the proposed projects, and there would not be any long-term cumulative impacts on heating and cooling systems, electrical systems, communication systems, potable water and wastewater systems, or stormwater systems.

4.2.8 Health and Safety

The implementation of the Proposed Action in combination with other reasonably foreseeable projects at or near TAFB, including the proposed off-Base projects such as utility and highway maintenance and construction and large development projects, would have a cumulative, adverse impact on health and safety due to the inherent increase in health and safety risks associated with conducting construction projects. All proposed C&D projects implemented on TAFB would follow federal and state safety regulations and DoD and OSHA safety standards. All other proposed construction and demolition projects would be required to conduct construction activities in a manner that does not increase risk to workers, military personnel, or the public.

4.2.9 Hazardous Materials and Wastes, ERP, and Toxic Substances

Hazardous Materials and Wastes. There would be minor, adverse, cumulative impacts on hazardous materials and wastes with the implementation of the Proposed Action on base and moderate, adverse cumulative impacts on hazardous materials and wastes with the implementation of off-Base construction projects. The quantity of hazardous materials such as POLs used in vehicles and equipment would increase cumulatively on TAFB and these large

development projects off base such as California Forever during construction. On TAFB, only the smallest quantities necessary to support each proposed project would be used. Further, all hazardous waste generated as a result of the proposed C&D activities would be disposed of properly and in accordance with the TAFB *Hazardous Waste Management Plan* (US Air Force 2019). Following the requirements of federal, state, and local regulations during all proposed project C&D activities on TAFB would ensure the proper handling of hazardous materials and disposal of hazardous wastes. For the construction of off-Base projects, the use and tracking of all hazardous materials and disposal of hazardous waste would follow local, state, and federal regulations.

Environmental Restoration Program. All active ERP sites would be continuously monitored, and remediation activities implemented as required by each site's corrective action plan. All proposed projects on TAFB, including the Proposed Action and reasonably foreseeable future projects, would avoid impacts on known contaminated soils or groundwater; prior to the disturbance of any potentially affected groundwater a construction waiver would be generated by AFCEC/CZOW ERP Office. This would ensure that there would be no cumulative impacts from ERP sites on proposed projects or to ERP sites from proposed project construction activities.

Toxic Substances. There is the potential for short-term, minor, adverse cumulative impacts from either ACMs or LBP or both that could be encountered during the demolition of facilities, including the existing lift station, at TAFB. However, prior to any demolition or renovation of existing facilities, ACMs and LBP surveys would be conducted if those surveys have not been previously completed. All ACMs and LBP detected would be properly handled and disposed of in accordance with federal, state, and local laws during demolition activities. It is not anticipated that any off-base proposed project would generate a substantial volume of ACMs and LBP, as most of the proposed projects are construction related and not demolition related. The proposed Recology Hay Road Landfill Expansion would increase the life span and volume of the landfill providing additional capacity for disposal of ACM from TAFB and other off-Base demolition projects.

4.2.10 Socioeconomics

There would be beneficial cumulative impacts from the additional materials and labor associated with the Proposed Action in combination with other proposed construction projects on and off TAFB. Collectively these proposed construction and improvement projects would provide increased expenditures in the region during these construction activities. However, these expenditures, such as increased payroll tax revenue and the purchase of additional equipment, materials, and fuel, would cease at the end of construction of the Proposed Action and other reasonably foreseeable on-Base and off-Base projects.

4.3 Summary of Environmental Management and Mitigations

- BMPs will be implemented in accordance with the TAFB stormwater requirements during construction activities. Following construction, all disturbed soils will be revegetated with

native herbaceous plants via hydroseeding or some other method of ensuring adequate vegetation cover.

- Surveys for nesting migratory birds at the existing lift station will be conducted prior to lift station demolition activities.
- To offset unavoidable impacts on California tiger salamander habitat, TAFB will purchase 24,130 square feet of credits at a USFWS-approved California tiger salamander conservation bank in accordance with the BA and PBO requirements (**Appendix C**).
- To offset unavoidable impacts on vernal pool branchiopods, TAFB will purchase 2,084.79 square feet of credits at a USFWS-approved conservation bank for these species in accordance with the BA and PBO requirements (**Appendix C**).
- TAFB will implement all conservation and species-specific minimization measures described in the project's BA (**Appendix C**).
- Active monitoring wells for ERP Site FT005 will be avoided by construction workers. The construction activities will not destroy or cover these active monitoring wells with soil, debris, or equipment of any kind. Access to these monitoring wells will be maintained during all lift station demolition and construction activities.
- Prior to the disturbance of any potentially affected soils, a TAFB dig permit will trigger ERP review of the ERP sites. The review will determine the steps to be taken at the construction location to avoid contaminated groundwater and soils, avoid damage or access restrictions to monitoring wells, and whether or not the project area qualifies for a waiver.

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5.0 LIST OF PREPARERS

The following government agency individuals supported the preparation of this Environmental Assessment.

Leslie Peña
TAFB
Environmental Element Chief
Contribution: Project Planning and Proposed Action and Alternatives Development

Daniel Marchesseault
TAFB
NEPA Manager
Contribution: Planning and EA Development

Lucas Zavala
US Army Corps of Engineers
Contribution: Project Manager and Contracting Officers Representative

Table 5-1 provides the list of preparers from the contractor team for this Environmental Assessment.

Table 5-1. List of Preparers

Name	Affiliation	Education	Years of Experience	Contribution
Dan Becker, GISP	Vernadero Group Inc.	MA Geography BA, Geography	15	Spatial Analyses, Maps
Maggie Fulton	Vernadero Group Inc.	BS, English	34	Technical Editing, Formatting
Katharine Hewlings	Vernadero Group Inc.	MS, Architecture MA, Museum Studies BA, Anthropology	3	GIS and Cartography
Arnaud Kerisit	Vernadero Group Inc.	MS, Earth and Environmental Science, Aquatic Ecology Concentration BS, Earth and Environmental Science, Aquatic Ecology Concentration	13	Biological Resources
Michael Lenzi, RPA	ASM Affiliates Inc.	MA, Precontact Archaeology BA, Anthropological Archaeology	18	Cultural Resources
Carey Lynn Perry	Vernadero Group Inc.	MS, Oceanography and Coastal Sciences BS, Marine Science	17	Quality Assurance/Quality Control Review
Crystal Ramey	Vernadero Group Inc.	BA, Visual Arts	22	508 Compliance; Production
Chris Squires	Vernadero Group Inc.	BS, Geology	7	Earth Resources, Water Resources, Hazardous Materials and Waste
Eric Webb, PhD	Vernadero Group Inc.	PhD, Oceanography and Coastal Sciences MS, Biology BS, Biology	28	Project Management, Noise, Air Quality, Socioeconomics, Health and Safety

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APPENDIX A. INTERAGENCY AND INTERGOVERNMENTAL COORDINATION AND CONSULTATIONS AND PUBLIC NOTICES

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A-1. EXAMPLE SCOPING LETTER

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DEPARTMENT OF THE AIR FORCE
60TH CIVIL ENGINEER SQUADRON (AMC)

30 August 2024

Mr. David C. Lin
Deputy Base Civil Engineer
60th Civil Engineer Squadron
411 Airman Drive, Bldg. 570
Travis AFB CA 94535

Mr. Jim Bermudez
City of Suisun City
Development Services
701 Civic Center Blvd
Suisun CA 94588

Dear Mr. Bermudez

In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the United States Air Force (USAF) NEPA regulations, the USAF, Air Mobility Command, Travis Air Force Base (TAFB) is preparing an Environmental Assessment (EA). The EA will evaluate potential environmental impacts associated with the proposed construction of a new lift station to transfer wastewater from TAFB to the Fairfield-Suisun Sewer District (FSSD).

TAFB is located in Solano County, California, approximately 50 miles northeast of San Francisco, and 40 miles southwest of Sacramento (Figure 1). TAFB occupies 5,137 acres of land and 357 acres of geographically separated units and includes 394 buildings. The existing wastewater lift station (Building 1150) is located in the southeastern portion of TAFB, south and east of the airfield (Figure 2). The lift station pumps approximately 80 percent of the sewage generated by TAFB, which is approximately 1 million gallons per day. The lift station moves wastewater from TAFB to the FSSD force main for treatment off Base at the FSSD wastewater treatment plant. The existing lift station has deteriorated substantially and is failing. It needs immediate replacement because it was not designed as a new facility but is the product of modifying an older lift station.

The purpose of the Proposed Action is to continue to remove wastewater from TAFB, as there is no operational wastewater treatment plant on the Base. Constant maintenance is required to keep the current lift station operational. The lift station's concrete vault has cracks and is crumbling around the pipe openings; pipes are severely corroded and have developed holes; the lift station pumps have reached the end of their life as one has completely failed; the electrical panels are outdated; and a monitoring device needs to be installed to monitor lift station flow rate, wastewater levels, pumps, and macerator. Failure of the lift station would eliminate wastewater treatment at the Base, impacting the mission. Therefore, a fully functional and operational lift station is needed to ensure TAFB's wastewater is safely and effectively moved to the FSSD sanitary sewer system.

TAFB proposes to replace the existing wastewater lift station in a manner that ensures the continued and proper treatment of TAFB wastewater. As the continuous treatment of wastewater is essential to mission functions at TAFB, any loss of wastewater treatment function could make the use of potable water and disposal of wastewater impossible. The implementation of the Proposed Action, which would construct a new lift station adjacent to the existing lift station, route the piping to the new lift station, and then demolish the existing lift station, would be a seamless transition from the existing wastewater lift station.

The new lift station, including a concrete pad, would have a permanent disturbance area of 5,490 square feet (0.13 acre). The total temporary disturbance would be 26,300 square feet (0.60 acre). Therefore, the total construction work area would be 31,790 square feet (Figure 2), approximately 0.73 acre. Impacts would also occur from the re-routing of utilities, but those impacts would occur within the work site. It is anticipated that the construction of the new lift station and demolition of the existing lift station would be accomplished in two years or less.

If you have additional information regarding the potential impacts of the Proposed Action on the environmental aspects of the project area of which we are unaware, we would appreciate receiving such information for inclusion and consideration during the NEPA process. To ensure TAFB has sufficient time to consider your input in the preparation of the Draft EA, please forward issues or concerns within 30 days of receipt of this letter to Ms. Leslie Peña, Environmental Chief, 60th Civil Engineer Squadron, 411 Airmen Drive, Travis AFB, California 94535-2176, by telephone at 707-424-0891, or by email at leslie.pena@us.af.mil.

Sincerely,

LIN.DAVID.C.1188122392
Digitally signed by LIN.DAVID.C.1188122392
Date: 2024.10.10 14:06:00 -07'00'

David C. Lin, P.E., GS-14 DAFC
Deputy Base Civil Engineer

Two Attachments:
1. Location of Travis Air Force Base
2. Existing and Proposed New Wastewater Lift Station

Attachment 1

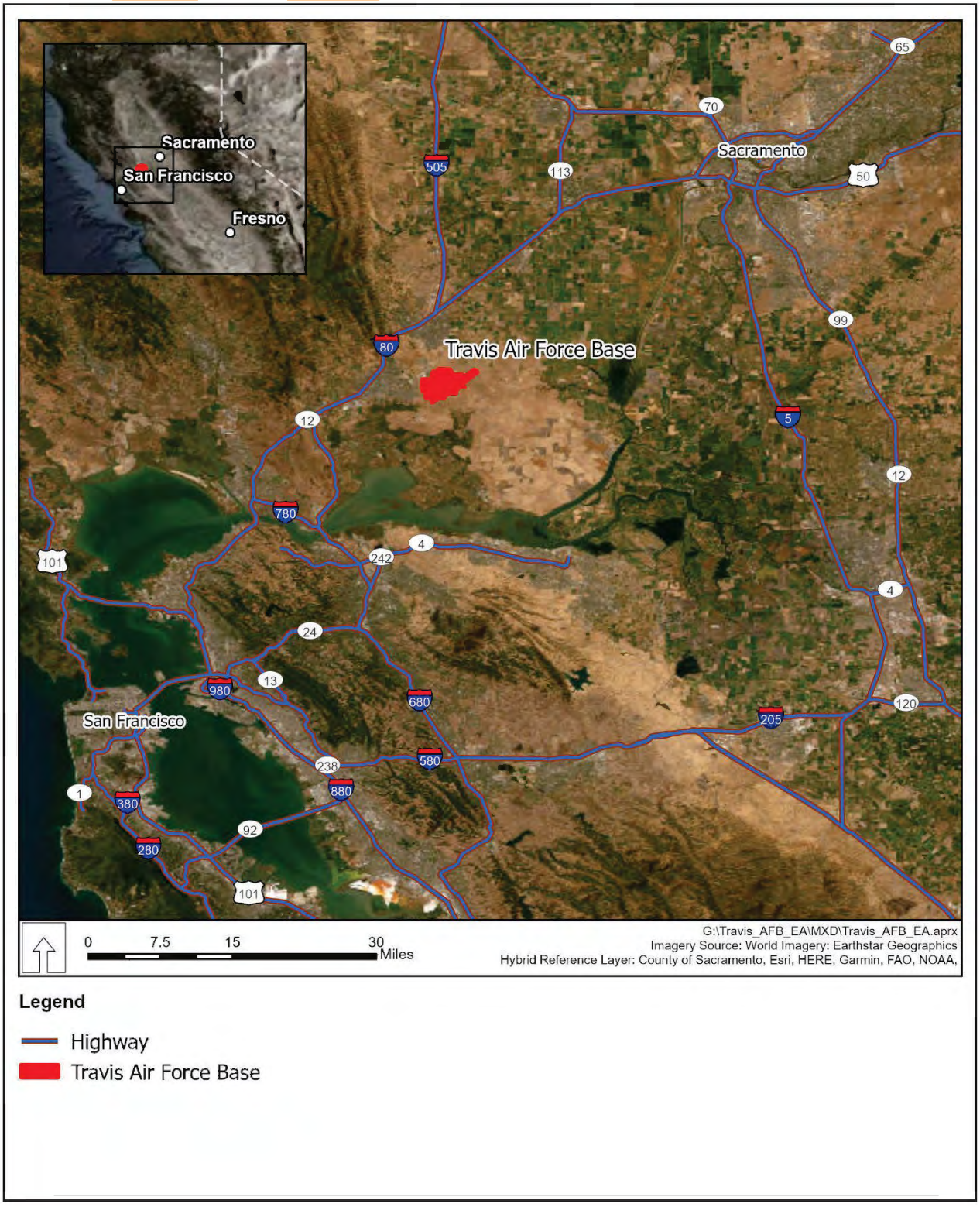

Figure 1. Location of Travis Air Force Base

Attachment 2

Figure 2. Existing and Proposed New Wastewater Lift Station

A-2. SCOPING LETTER RESPONSES

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YOCHA DEHE
CULTURAL RESOURCES

October 27, 2024

Department of the Air Force
60th Civil Engineer Squadron
Attn: David C. Lin, Deputy Base Civil Engineer
411 Airman drive, Bldg. 570
Travis AFB CA 94535

RE: Travis Air Force Base (TAFB) Wastewater Lift Station YD-08222024-04

Dear Mr. Lin:

Thank you for your project notification letter dated Monday, August 5, 2024, regarding cultural information on or near the proposed Travis Air Force Base (TAFB) Wastewater Lift Station. We appreciate your effort to contact us and wish to respond.

The Cultural Resources Department has reviewed the project and concluded that it is within the aboriginal territories of the Yocha Dehe Wintun Nation. Therefore, we have a cultural interest and authority in the proposed project area.

Based on the information provided, Yocha Dehe Wintun Nation is not aware of any known cultural resources near this project site and a cultural monitor is not needed. However, if any new information is available or cultural items are found, please contact the Cultural Resources Department.

Should you have any questions, please contact:

Yocha Dehe Wintun Nation
Cultural Resources Department
Office: (530) 796-3400
Email: THPO@yochadehe.gov

Please refer to identification number YD-08222024-04 in correspondence concerning this project.

Thank you for providing us the opportunity to comment.

Sincerely,

Signed by:
Yvonne Perkins
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Tribal Historic Preservation Officer

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Newsom: GOP efforts to ban abortion part of 'war on women'

TRIBUNE CONTENT AGENCY

Allen J. Schaben/Los Angeles Times/TNS file (2022)

Gov. Gavin Newsom speaks during a news conference to unveil the next phase of California's pandemic response in the UPS Healthcare warehouse filled with personal protective equipment in Fontana, Feb. 17, 2022.

Gov. Gavin Newsom will tell NBC's "Meet the Press" Sunday that the Alabama ruling that frozen embryos can be regarded as children is part of a Republican "war on women more broadly defined, including, as we know, contraceptives."

Newsom, in Washington for the National Governors Association conference, taped the interview earlier during his trip. The Sacramento Bee obtained a partial transcript Saturday.

The Alabama Supreme Court ruled recently that embryos created by in vitro fertilization are children, sparking fear that someone who damages the embryos could face penalties.

Democrats see their strong, historic support for abortion rights as a major campaign asset. Newsom has been a strong supporter of President Joe Biden, and cited strong differences between the two parties on abortion rights issues.

Former President Donald Trump, who is running in November to regain the White House, has said privately he's considering backing a 16-week federal ban on abortions that would include exceptions.

Newsom scoffed. "These people aren't serious," he said.

Other Republicans will push for a tougher ban, the governor said, and Trump would sign a national ban.

"You want to understand the contours of this debate that we will be having over the next nine months," he said.

On Friday, Newsom told CNN's "The Lead With Jake Tapper" that "apparently, what the Republican Party is saying – is the rapists have more rights to bring those babies to birth, than families that are trying desperately to have the privilege you and I have had as fathers and parents."

The governor has been in Washington for several days. At a Thursday meeting with White House staffers, Newsom raised what a news release called "California's insistence" that the Federal Emergency Management Agency "honor its commitment to fully reimburse California's local governments for expenses to shelter and protect homeless people under Project Roomkey during the Covid pandemic."

The program began in early 2020, as the pandemic sent the economy reeling. It paid for thousands of homeless people to live in hotels, so they would avoid being squeezed into shelters where the coronavirus could easily spread.

The state believed Washington would pay for the stays, but FEMA later declared it would only pay limited amounts for Project Roomkey after mid-2021. That leaves the state and local governments with bills totaling millions of dollars, according to a report by CalMatters earlier this month.

Biden himself stuck to broader themes when he met with the governors Friday morning. In a brief talk with the state leaders, he urged them to push for the compromise immigration plan that is stalled in Congress. Governors sat at tables listening, with fact sheets at each seat describing the plan.

"If this matters to you, matters to your state, tell your members of Congress that are standing in the way, show a little spine," Biden said.

Later Friday, CNN's Jake Tapper asked Newsom about Nikki Haley, the former United Nations ambassador who's challenging Trump for the GOP presidential nomination.

"I think she's one of our better surrogates, so I hope she stays in," Newsom said.

He smiled as he said he was enjoying watching her campaign. "I hope it continues. So I wish her luck."

SBA hosts webinar on PPP loan forgiveness

DAILY REPUBLIC STAFF
DRNEWS@DAILYREPUBLIC.NET

FAIRFIELD — The Small Business Association will host a webinar on Monday on How to Request or Verify Paycheck Protection Program (PPP) Forgiveness.

Some businesses may be eligible to have these loans forgiven.

The online talk will provide information on the process of requesting or verifying forgiveness for a PPP loan.

Borrowers who have a defaulted PPP loan less than $100,000 have to request forgiveness by March 3. After March 3, they will be referred to the IRS and the Treasury Department for collection, which may include significant consequences.

The free webinar will take place from 2 to 3 p.m. To register for the webinar, go to www.sba.gov.

EDC

From Page A3

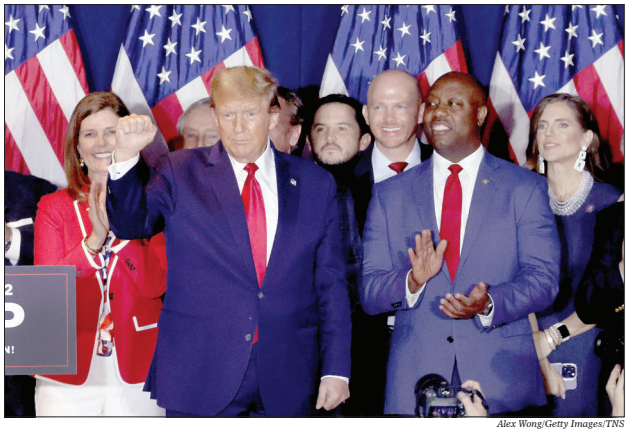
engineering.

"With a background in art, computer science, and web engineering, (Van Pelt) brings a unique perspective to the intersection of technology and creativity," the Solano EDC said in a statement.

Other speakers include Tim Flanagan, Solano County chief information officer; Vincent Liu, Research Scientist III at Kaiser Permanente Division of Research; and Jim O'Connor, professor of Education and founding dean emeritus of the College of Education and Health Sciences at Touro University California.

The event is set for noon to 1:30 p.m. Feb. 28.

Register at https://us02web.zoom.us/webinar/register/WN_bExDyw-MQSPywFQqg_TLCGw.



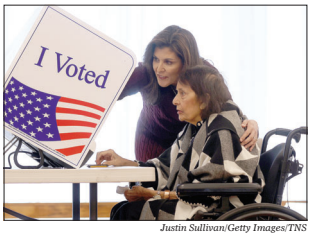
Alex Wong/Getty Images/TNS

Republican presidential candidate and former President Donald Trump gestures to supporters as Sen. Tim Scott, R-S.C., applauds after Trump spoke during an election night watch party at the State Fairgrounds in Columbia, South Carolina, Saturday. Trump defeated opponent Nikki Haley in the South Carolina Republican primary.

Trump wins SC GOP presidential primary

Beating out the state's former Gov. Nikki Haley

TRIBUNE CONTENT AGENCY



Justin Sullivan/Getty Images/TNS

Republican presidential candidate former U.N. Ambassador Nikki Haley, left, helps her mother, Raj Kaur Randhawa, cast her ballot in the South Carolina Republican primary in Kiawah Island, South Carolina, Saturday.

CHARLESTON, S.C. — Continuing his march to the Republican presidential nomination, former President Donald Trump won the South Carolina GOP presidential primary, comfortably beating former South Carolina Gov. Nikki Haley in her home state.

The Associated Press called the race at 7 p.m.

This is the first time Haley, who was elected twice as governor and three times as a state representative from Lexington County, lost an election in South Carolina.

With Saturday's defeat, it remains to be seen if Haley will continue onto Michigan and to Super Tuesday. However, she has remained defiant to the calls that she should drop out of the race.

In a speech Tuesday, she said she would continue beyond Saturday's primary results.

"Well, I'm not afraid to say the hard truths out loud. I feel no need to kiss the ring. And I have no fear of Trump's retribution," Haley said Tuesday. "I'm not looking for anything from him. My own political future is of zero concern."

But Haley faces questions whether donors will continue to support her campaign, as ultimately having the money come in will be key to keeping her effort going.

"Nikki Haley has been raising money significantly better than her standing and her poll numbers would indicate," said Dave Wilson, a longtime GOP strategist in South Carolina. "There are a lot of Republicans who are still out there right now that do not want Donald Trump in office again. Those are the people who are looking past the poll numbers to invest in a known quality of a candidate in Nikki Haley who they see as their opportunity to bring an end to Donald Trump's run for president, or at least challenge it."

Haley's campaign has said it has resources to continue and boasted raising $16.5 million in January. She has events planned going forward including a swing in Michigan, which holds its primary Tuesday, and events leading up to Super Tuesday on March 5 when 15 states and American Somoa hold nominating contests.

Haley's campaign Friday announced a seven-figure cable and digital advertising buy ahead of Super Tuesday.

"Our fundraising continues to grow," said Haley Campaign Manager Betsy Ankney. "We are fully confident that we will have the resources to compete moving forward."

Trump remains in the driver's seat for GOP nomination

Winning the S.C. GOP primary is key to any presidential campaign. Since 1980 the winner of South Carolina's nominating contest has gone on to win the GOP nomination every time except for 2012.

Trump has now won the first four early contests as he has remained the front-runner in the GOP race since announcing his reelection run in November 2022.

The former president's margin of victory Saturday is expected to be much larger than his 2016 performance when he won the first-in-the-South primary with 32.5% of the vote. U.S. Sen. Marco Rubio, R-Fla., who was backed by Haley, came in second with 22.5% of the vote.

"With such a clear contrast between the results we saw in Trump's four years and Biden's term, there's no debate on why so many people would take Trump back," said Mark Knoop, a veteran political consultant in South Carolina.

Going into Saturday's primary, Trump held a tight grip on the state's GOP. He had the support of all but one statewide

*See **Trump**, Page A6*

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Pain, punishment, push-ups: Air Force basic training is still a bear, but there's less screaming

Sig Christenson
San Antonio Express-News

Every year, 30,000 civilians arrive at Joint Base San Antonio-Lackland and leave 7 1/2 weeks later as full-fledged U.S. Air Force airmen

They rise early and spend their days marching, running and being yelled at a lot. It's the military's way of breaking down civilian habits and rebuilding recruits into something newer, tougher and better.

There's a no-pain, no-gain philosophy in the making of an airman. There will be pain. There must be pain if a recruit is to get ahead, and so they'll stretch muscles they didn't know they had. They'll discover they could run much farther than they thought possible – and faster, too.

Here's an overview of Air Force basic training.

No more shark attacks

It all begins with Zero Week, the first five days of boot camp. Zero Week has changed a lot in the last year. Recruits still stand in line to get shots. They still lose their hair to barbers in less than 60 seconds. But in other ways, it's a kinder, gentler start to the most intense time of the recruits' lives.

Like the Army and other military branches, the Air Force no longer employs a "shark attack" approach to greeting new recruits. In shark attacks, made famous by movies and TV shows, military training instructors swarm the new arrivals, pelting them with high-decibel verbal abuse.

Now, the goal is to put less pressure on trainees, at least in the first five days, and give them a chance to get their bearings.

"If you're really, really relaxed, you're not going to learn a lot, you're not going to really care. And if you're too overstressed, you can't even begin to learn," said Lt. Col. Alvin Schultz Jr., deputy commander of Air and Space Force basic military training. "So the ideal spot is the sweet spot in the middle where there's just enough stress on individuals where they are challenged but are also learning."

Service before self

What hasn't changed about Zero Week? Trainees still learn the Air Force's core values: integrity, service before self and excellence in everything they do. They are required to know the Pentagon's leadership from the top down, starting with the chairman of the Joint Chiefs of Staff, Charles "C.Q." Brown, and Defense Secretary Lloyd Austin.

They're issued digital tablets for daily instruction, but recruits still carry a paper document, Form 341, as they have for generations. It's used by instructors to document excellence and failures in performance. They're also given pocket-sized handbooks, including "The Profession of Arms: Our Core Values," which outlines the basics of life in the Air Force.

All about wings

They learn the difference between groups, wings and squadrons.

The squadron is the basic organizational unit of the Air Force, the beating heart of the service. Next come groups. They consist of several squadrons and are usually led by a colonel.

Wings are made up of one or more groups and are commanded by a colonel or in some cases a one-star general.

'Tools,' not punishment

If Zero Week isn't as harsh as it once was, things get tough after those first five days. That's when recruits are assigned to their training flights. They face physical punishment for making mistakes. Screw up, and you'll do 60 seconds of push-ups, sit-ups, flutter kicks, squats or some other exhausting exercise. Instructors are allowed to administer one exercise for 60 seconds or two exercises for 30 seconds each – not to exceed one minute.

Nowadays, those forms of discipline come dressed up with a euphemism. They're called "tools."

The 28,088 active-duty, National Guard, Air Force Reserve and Space Force recruits who graduated from basic training at Lackland last year know the word well. Airman Basic Steven Vanleer, of Philadelphia, said disciplinary measures are called tools "because tools fix things."

There's a reason for the soft-edged language. Most recruits today are from Gen Z, the generation born between the mid-1990s and 2010. They grew up in a tech-focused world and tend to have different skills and

See *Train*, Page 10

In brief

It's nothing but Nerf for Travis kids at the Nerf Elite Jr. Event

TRAVIS AIR FORCE BASE — Military kids are invited to call the shots and have fun at the Travis Exchange's in-store Nerf Elite Jr. event.

From noon to 3 p.m. Feb. 24, military families can bring their children ages 6 and older to play with a variety of Nerf toys, including the Elite Jr. Starter Set, the Elite Jr. Explorer and the Elite Jr. Racer.

"The Exchange is happy to provide this in-store opportunity for our military families and help give military kids safe and fun activities," Travis Exchange General Manager Cathie Byrns said. "We're excited to host our youngest heroes who work hard and sacrifice for their country, too."

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SOUTHERN CALIFORNIA

Jury convicts socialite in 2020 hit-and-run deaths of two

The Associated Press

LOS ANGELES » A Southern California socialite has been found guilty of murder and other charges in the hit-and-run deaths of two young brothers in a crosswalk more than three years ago.

Authorities said Rebecca Grossman, wife of a prominent Los Angeles burn doctor, fatally struck Mark Iskander, 11, and brother Jacob, 8, while speeding behind a car driven by then-lover Scott Erickson, a former Los Angeles Dodgers pitcher.

The jury on Friday found Grossman guilty on all counts: Two felony counts each of second-degree murder and gross vehicular manslaughter, and one felony count of hit-and-run driving resulting in death. She faces 34 years to life in prison.

The deadly crash occurred on the evening of Sept. 29, 2020, in Westlake Village, a city on the western edge of Los Angeles County.

Attending the court proceedings "felt like I am attending the funeral of the boys again, day after day," their mother, Nancy Iskander, told reporters after the verdict. "Someone is now held accountable. Mark and Jacob did not die, Mark and Jacob were murdered."

Grossman was not charged with being under the influence, but former baseball player Royce Clayton testified he had joined her and Erickson at a nearby restaurant where Erickson had two margaritas and Grossman had one, the Los Angeles Times reported.

Prosecutors presented evidence that the data recorder in Grossman's white Mercedes showed she was speeding at up to 81 mph (130 kph) and tapped her brakes, slowing her to 73 mph (117 kph), less than two seconds before a collision that set off her airbags.

The district attorney's office commended the jury for its ruling in a statement.

"This decision underscores our commitment to holding accountable those who drive with total disregard for human life," the statement said. "We know that this guilty verdict can never replace their lives but we hope it may provide some peace for the Iskander family as they continue a life-long journey of healing from this tragedy.

Grossman's lead defense attorney, Tony Buzbee, repeatedly blamed Erickson for the deaths, suggesting the retired baseball player's car hit Jacob, hurling him to a curb, and then hit Mark, throwing him into the path of Grossman's Mercedes, the Times reported.

Buzbee did not immediately return a request for comment after the verdict was read.

An attorney for Erickson has said the former ballplayer denies contributing in any way to the tragedy. Erickson was initially charged with a misdemeanor count of reckless driving but it was dismissed after he made a public service announcement, the Times said.

Nancy Iskander testified that the black SUV did not hit her sons but could have hit her and her 5-year-old son, Zachary. She said she dove out of the way and pulled Zachary to safety.

The mother said she did not see Mark and Jacob being struck but three eyewitnesses testified they saw a white or light-colored vehicle hit the boys.

Grossman's husband, Dr. Peter Grossman, medical director of the Grossman Burn Centers, was called to testify by his wife's defense. The Grossmans are founders of the Grossman Burn Foundation, which promotes care and support of burn survivors.

DEEP DIVISIONS

Oaths, pledges for political officials are changing

By Julie Carr Smyth and Kimberlee Kruesi
The Associated Press

DAVID A. LIEB — THE ASSOCIATED PRESS FILE

Missouri Secretary of State Jay Ashcroft speaks to reporters on June 29, 2022, at his Capitol office in Jefferson City, Mo.

COLUMBUS, OHIO » The resignation letter was short and direct.

"I can no longer be under an oath to uphold the New Constitution of Ohio," wrote Sabrina Warner in her letter announcing she was stepping down from the state's Republican central committee.

It was just days after Ohio voters resoundingly approved an amendment last November to the state constitution ensuring access to abortion and other forms of reproductive health care. For many, the vote was a victory after the U.S. Supreme Court overturned a constitutional right to abortion in 2022.

For Warner, a staunch abortion opponent, it meant she could no longer stand by the Ohio Constitution she had proudly sworn an oath to uphold just over a year before.

Throughout modern American history, elected officials have sworn oaths to uphold constitutions and said the Pledge of Allegiance without much controversy. In a handful of cases recently, these routine practices have fallen victim to the same political divisions that have left the country deeply polarized.

Disagreements over abortion rights, gun control and treatment of racial minorities are some of the issues that have caused several political leaders to say they cannot take an oath or recite the pledge.

Some Republicans, including Missouri Secretary of State Jay Ashcroft, a candidate for governor, point to amendments enshrining abortion rights in state constitutions. Ohio's protections passed last fall, and advocates are proposing an initiative for the Missouri ballot this year.

Warner signed off her resignation letter, effective two days after Ohio's vote, with a biblical reference to "the cowardly, the vile, the murderers" and more being "consigned to the fiery lake of burning sulfur." She did not return messages seeking comment.

In Tennessee this month, Democratic Rep. Justin Jones declined to lead the pledge during a legislative session. He gained national attention after being one of two Black lawmakers whom Republicans briefly expelled from the state House last year after he and two other Democrats participated in a demonstration advocating for gun control from the House floor, outraging GOP members because it violated the chamber's rules.

Tennessee House members are tapped to find a minister to lead a prayer before the start of a session and then to lead the chamber in the pledge to the American flag. Just before he was to do so, Jones submitted a handwritten note to the House clerk that read, "I prefer not to lead the pledge of allegiance."

His refusal came as he has criticized his Republican colleagues for being racist and focusing on what he said are the wrong issues, such as targeting the LGBTQ+ community rather than addressing gun control nearly a year after six people, including three children, were killed in a school shooting in Nashville.

While another Democratic lawmaker, an Army veteran, led the pledge without commenting on Jones' refusal, Republicans quickly expressed their outrage at Jones' decision. GOP Rep. Jeremy Faison called Jones' refusal to say the Pledge of Allegiance a "disgrace."

"In my opinion, he should resign. That is an embarrassment to veterans and to people who have come before us," Faison said.

Jones, responding later to the Republican criticism, said he "couldn't bring myself to join their performative patriotism as they continue to support an insurrectionist for president and undermine liberty and justice for all."

Jones' stance recalled a similar one in 2001, when then-Tennessee Rep. Henri Brooks said she was chastised by Republican leaders for refusing to join her fellow lawmakers in the pledge. Brooks, who is Black, told media outlets at the time that she hadn't recited the pledge since being in the third grade and declined to do so because the American flag represented the colonies that enslaved her ancestors.

Earlier this year, former President Donald Trump refused to sign a loyalty oath in Illinois, a pledge that has been in place since the McCarthy era.

The part Trump left unsigned confirms that candidates "do not directly or indirectly teach or advocate the overthrow of the government" of the United States or the state or "any unlawful change in the form of the governments thereof by force or any unlawful means." Trump, who signed the voluntary oath during his presidential runs in 2016 and 2020, has yet to say why he didn't sign it this time.

He has faced a number of state lawsuits seeking to bar him from the ballot related to his role in the Jan. 6, 2021, attack on the U.S. Capitol, an issue that is currently before the U.S. Supreme Court.

His spokesman, Steven Cheung, did not return an email seeking comment but told news outlets in a statement in January: "President Trump will once again take the oath of office on January 20th, 2025, and will swear 'to faithfully execute the office of president of the United States and will to the best of my ability preserve, protect and defend the Constitution of the United States.'"

Unlike with the Pledge of Allegiance, declining to take an oath of office often carries the higher price of being unable to hold an elected position.

In Missouri, Ashcroft drew attention in October when he said that he would refuse to take the oath of office as governor if voters protect a right to abortion in the state Constitution.

"Any time a statewide official is sworn in, we swear an oath to uphold the Constitution of the United States and of the state of Missouri," he told reporters after an abortion-related court hearing. "If I cannot do that, then I would have to leave my position. I cannot swear an oath and then refuse to do what I'd said I would do."

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ST TE F CALIF RNI
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I am a citiz n of th United Stat s. I am ov r th age of eight n y ars and not a party to or interested in the above-entitled matt r. I am the Legal dvertising Clerk of the print r and publisher of the Vacaville Report r, a newspaper published in the English language in the Cities of Vacaville and Dixon, County of Solano, Stat of California.

I declare that the Vacaville Report r is a newspaper of general circulation as defined by the laws of the Stat of California as determined by this court's order dated June 18, 1952 in the action ntitl d In th Matter of th Ascertainm nt and Establishment of the Standing of the Vacaville Reporter as a Newspaper of General Circulation, Cas Number 25888. Said order stat s "Vacaville Report r" has been established, printed and published in the Citi s of Vacaville and Dixon, County of Solano, Stat of California; That it is a newspaper published daily for the diss mination of local and t legraphic news and int lligenc of general charact r and has a bona fid subscription list of paying subscrib rs; and...THEREF RE, IT IS OR ERE , JU ED N ECREED:...That "Vacaville Report r" is a newspaper of general circulation for the City of Vacaville and Dixon, County of Solano, California. Said order has not been revok d.

I declare that this notice, of which the annexed is a printed copy, has been published in each regular and entir issue of said newspaper and not in any supplement th r of on th following dat s, to wit:

02/25/2024

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

at d at Vacaville, California, this
4th day of March 2024

(Signature) Melanie Irm r

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The 60th Air Mobility Wing (AMW) is preparing a Draft Environmental Assessment (EA) to evaluate potential environmental impacts associated with the demolition of the old wastewater lift station and its proposed replacement with the construction of a new wastewater lift station on Travis Air Force Base (AFB), California. Travis AFB presently transfers wastewater to the Fairfield-Suisun Sewer District (FSSD) for treatment. The existing lift station, which pumps wastewater to FSSD, has leaks and performance issues. The existing lift station is failing and needs immediate replacement because it was not designed as a new facility but is the product of modifying an older lift station and is rapidly deteriorating. The lift station's concrete vault has cracks and is crumbling around the pipe openings; pipes are severely corroded and have developed holes; the lift station pumps have reached the end of their life; the electrical panels are outdated; and a monitoring device needs to be installed to monitor lift station flow rate, wastewater levels, pumps, and macerator. A failure of the lift station would reduce the use of water that would enter the wastewater stream from sinks and toilets and elimination of wastewater at Travis AFB, impacting the Base's mission. The purpose of the Proposed Action is to continue to remove wastewater from Travis AFB. A fully functional and operational lift station is needed to ensure Travis AFB's wastewater is safely and effectively moved to the FSSD sanitary sewer system.

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The 60th AMW requests advance public comment to determine if there are public concerns regarding the proposed project's potential impacts on floodplains and wetlands. The 60th AMW would also like to solicit public input or comments on potential project alternatives. The proposed project will be analyzed in the forthcoming EA, and the public will have the opportunity to comment on the Draft EA when it is released.

The advance public comment period is 25 February 2024 to 26 March 2024. Please submit comments or requests for more information to Leslie Peña, Environmental Chief, 60th Civil Engineer Squadron, 411 Airmen Drive, Travis AFB 94535-2176; or electronically to leslie.pena.1@us.af.mil.

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A-4. CONSULTATION LETTERS

FORMAT PAGE

EXAMPLE TRIBAL CONSULTATION LETTER

DEPARTMENT OF THE AIR FORCE
60TH CIVIL ENGINEER SQUADRON (AMC)

5 August 2024

Mr. David C. Lin
Deputy Base Civil Engineer
60th Civil Engineer Squadron
411 Airman Drive, Bldg. 570
Travis AFB CA 94535

Chairperson Donald Duncan
Guidiville Rancheria of California
[redacted]

Dear Chairperson Duncan

In accordance with Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations at 36 Code of Federal Regulations (CFR) Part 800, the Department of the Air Force (DAF), Travis Air Force Base (TAFB), is advising you of a proposed undertaking that has the potential to affect historic properties. TAFB is proposing to replace the current TAFB wastewater lift station, which transfers wastewater from TAFB to the Fairfield-Suisun Sewer District (FSSD). The undertaking involves the construction of a new lift station and demolition of the existing lift station. In accordance with Section 106 of the NHPA, and its implementing regulations at 36 CFR 800, the DAF requests your input regarding cultural resources of importance to Native American communities that may be affected by the undertaking.

TAFB is located in Solano County, California, approximately 50 miles northeast of San Francisco, and 40 miles southwest of Sacramento (Attachment 1: Figure 1). TAFB occupies 5,137 acres of land and 357 acres of geographically separated units and includes 394 buildings. The existing wastewater lift station (Building 1150) is located in the southeastern portion of TAFB, southeast of the airfield (Attachment 2; Figure 2). The lift station pumps approximately 80 percent of the sewage generated by TAFB, which is approximately 1 million gallons per day. The existing lift station is failing and needs immediate replacement because it was not designed as a new facility but is the product of modifying an older lift station and has deteriorated substantially.

The new lift station, including a concrete pad, would have a permanent disturbance area of 5,490 square feet (0.13 acre). The total temporary disturbance would be 26,300 square feet. Therefore, the total construction work area would be 31,790 square feet (Attachment 2; Figure 2), approximately 0.73 acre. This construction work area is the Area of Potential Effects (APE) as proposed for the undertaking. Impacts would also occur from the rerouting of utilities, but those impacts would occur within the work site.

TAFB proposes to replace the existing wastewater lift station in a manner that ensures the continued and proper treatment of TAFB wastewater. As the continuous treatment of wastewater is essential to mission activities at TAFB, any loss of wastewater treatment function could make the use of potable water and disposal of wastewater impossible. The implementation of the undertaking, which would construct a new lift station adjacent to the existing lift station, route the piping to the new lift station, then demolish the existing lift station, would be a seamless transition from the existing wastewater lift station. It is anticipated that the construction of the new lift station and demolition of the existing lift station would be accomplished in two years or less.

ASM Affiliates has conducted a comprehensive Cultural Historical Resources Information System and Sacred Land File database search for resources within the APE and the 0.25-mile buffer to determine where archaeological studies have been conducted within this area and where known cultural resources are located, as well as to understand the types and quantity of the resources. No known sites exist within the APE, and two historic-era resources (P-48-000763 and P-48-000972) were previously recorded within the 0.25-mile buffer. Site P-48-000763 was originally recorded as a historic-era building consisting of the 1175 Strategic Air Command readiness crew facility. Site P-48-000972 was originally recorded as a historic-era farmstead site evidenced by surface finds consisting of domestic refuse and a shovel probe revealing historic structural materials.

ASM Affiliates completed a Phase I intensive pedestrian survey of the APE on 24 April 2024 (Attachment 3). Ground visibility was moderate, and no new cultural resources were identified during the pedestrian survey. The APE has been disturbed by previous grading, paved and gravel roads, construction of structures, buried sewer and water lines, and rock-lined drainages. Most of the vegetation observed consists of invasive species that typically grow in disturbed soils. A geoarchaeological overview and site sensitivity assessment indicates the surface of the APE has high potential for precontact resources, but the potential to encounter buried resources is very low. No new resources were identified on the surface and based on the pedestrian survey and geoarchaeological sensitivity assessment, there is low potential to encounter significant cultural resources during construction.

Knowing that certain information is only available through consultation, we encourage your participation in this process and respectfully request a response within 30 days of receipt of this letter under the NHPA for this undertaking. Your participation in the Section 106 consultation process will not affect the handling or disposition of human remains, funerary objects, sacred objects, or objects of cultural patrimony under the Native American Graves Protection and Repatriation Act. In the event such items are discovered, we will contact you regarding their handling and disposition. Please forward your written response to this request to Ms. Leslie Peña, Environmental Chief, 60th Civil Engineer Squadron, 411 Airmen Drive, Travis AFB, California 94535-2176, or contact her by phone at 707-424-0891 or by email at leslie.pena@us.af.mil. Thank you for your assistance.

Sincerely,

LIN.DAVID.C.1188122392 Digitally signed by LIN.DAVID.C.1188122392 Date: 2024.08.05 14:46:42 -07'00'

DAVID C. LIN, P.E., GS-14 DAFC
Deputy Base Civil Engineer

Three Attachments:
1. Location of Travis Air Force Base
2. Existing and Proposed New Wastewater Lift Station
3. Phase I Archaeological Survey for the Construction of a Lift Station at Travis Air Force Base, Solano County, California, 18 June 2024

Attachment 1

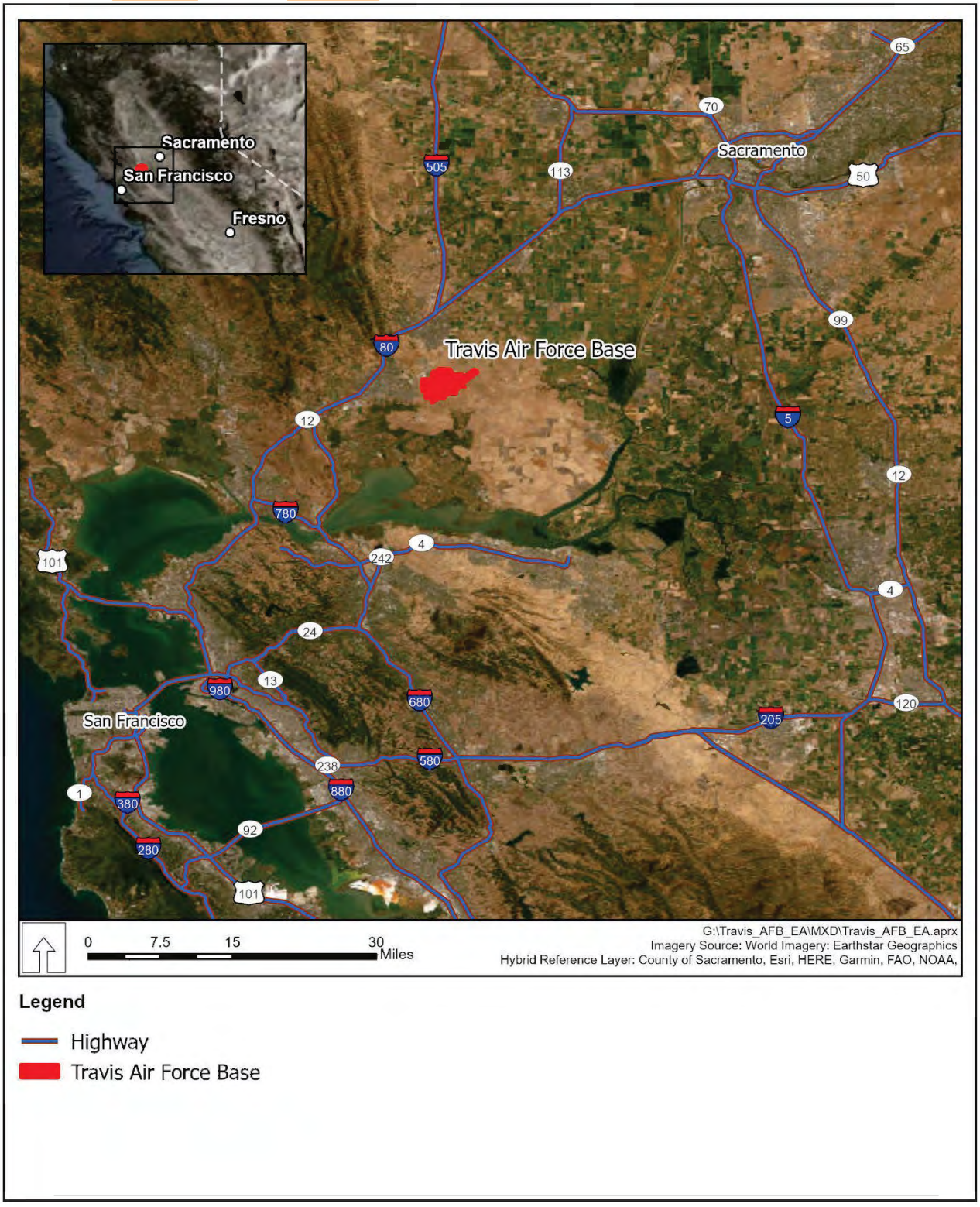

Figure 1. Location of Travis Air Force Base

Attachment 2

Figure 2. Existing and Proposed New Wastewater Lift Station

DEPARTMENT OF THE AIR FORCE
60TH CIVIL ENGINEER SQUADRON (AMC)

5 August 2024

Mr. David C. Lin
Deputy Base Civil Engineer
60th Civil Engineer Squadron
411 Airman Drive, Bldg. 570
Travis AFB CA 94535

Dr. Julianne Polanco
State Historic Preservation Office
Department of Parks and Recreation
Office of Historic Preservation
[redacted]

Dear Dr. Polanco

In accordance with Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations at 36 Code of Federal Regulations (CFR) Part 800, the Department of the Air Force (DAF), Travis Air Force Base (TAFB) is advising you of a proposed undertaking that has the potential to affect historic properties. The undertaking is the proposal to replace the current TAFB lift station, which transfers wastewater from TAFB to the Fairfield-Suisun Sewer District (FSSD). The undertaking involves the construction of a new lift station and demolition of the existing lift station. A cultural resources assessment was conducted to identify historical properties within the undertaking's Area of Potential Effects (APE).

This consultation combines a discussion of the APE for the undertaking (per 36 CFR 800.4), the identification methods used to identify historic properties, and the findings of the cultural resources assessment. We would like your concurrence with the APE defined for the proposed undertaking and with our determination that the proposed construction of the new lift station and demolition of the existing lift station at TAFB will have no effects to historic properties.

Background Information

TAFB is located in Solano County, California, approximately 50 miles northeast of San Francisco and 40 miles southwest of Sacramento (Attachment 1; Figure 1). TAFB occupies 5,137 acres of land and 357 acres of geographically separated units and includes 394 buildings. The existing wastewater lift station (Building 1150) is located in the southeastern portion of TAFB, southeast of the airfield (Attachment 2; Figure 2). The lift station pumps approximately 80 percent of the sewage generated by TAFB, which is approximately 1 million gallons per day. The existing lift station is failing and needs immediate replacement because it was not designed as a new facility but is the product of modifying an older lift station and has deteriorated substantially.

36 CFR 800.4(a)(1) – Description of the Area of Potential Effects

The new lift station, including a concrete pad, would have a permanent disturbance area of 5,490 square feet (0.13 acre). The total temporary disturbance would be 26,300 square feet. Therefore, the total construction work area would be 31,790 square feet (Attachment 2; Figure 2), approximately 0.73 acre. This construction work area is the APE as defined for this proposed undertaking. Impacts would also occur from the rerouting of utilities, but those impacts would occur within the work site.

36 CFR 800.11(e)(1) – Description of the Undertaking

The purpose of the undertaking is to continue to remove wastewater from TAFB, as there is no operational wastewater treatment plant on the base. Constant maintenance is required to keep the current lift station operational. The current lift station has exceeded its life expectancy and will fail in the foreseeable future. Failure of the lift station would completely eliminate wastewater treatment at the TAFB, impacting the mission. Therefore, a fully functional and operational lift station is needed to ensure TAFB wastewater is safely and effectively moved to the FSSD sanitary sewer system.

TAFB proposes replacing the existing wastewater lift station in a manner that ensures the continued and proper treatment of TAFB wastewater. As the continuous treatment of wastewater is essential to mission activities at TAFB, any loss of wastewater treatment function could make the use of potable water and disposal of wastewater impossible. The implementation of the undertaking, which would construct a new lift station adjacent to the existing lift station, route the piping to the new lift station, then demolish the existing lift station, would be a seamless transition from the existing wastewater lift station. It is anticipated that the construction of the new lift station and demolition of the existing lift station would be accomplished in two years or less.

36 CFR 800.11(e)(2) – Identification of Historic Properties

ASM Affiliates conducted a comprehensive Cultural Historical Resources Information System and Sacred Land File database search for resources within the APE and a 0.25-mile buffer to determine where archaeological studies have been conducted within this area and where known cultural resources are located, as well as to understand the types and quantity of the resources. No known sites exist within the APE, and two historic-era resources (P-48-000763 and P-48-000972) were previously recorded within the 0.25-mile buffer. Site P-48-000763 was originally recorded as a historic-era building consisting of the 1175 Strategic Air Command readiness crew facility. Site P-48-000972 was originally recorded as a historic-era farmstead site evidenced by surface finds consisting of domestic refuse and a shovel probe revealing historic structural materials.

The lift station is one component of a larger wastewater treatment plant at TAFB that was constructed in 1946 and labeled Building 1150. The DAF determined the wastewater treatment plant was not eligible for inclusion in the National Register of Historic Places under all criteria, and the State Historic Preservation Office (SHPO) concurred in a letter dated 2 July 2018 (TAFB Integrated Cultural Resources Management Plan 2021: Appendix M). The DAF demolished two Imhoff tanks, a settling tank, manhole structures, and has capped associated piping and utilities. This undertaking proposes to demolish the lift station, which is a remaining element of the ineligible wastewater treatment facility that has been mostly demolished.

ASM Affiliates completed a Phase I intensive pedestrian survey of the APE on 24 April 2024 (Attachment 3). Ground visibility was moderate, and no new cultural resources were identified during the pedestrian survey. The APE has been disturbed by previous grading, paved and gravel roads, construction of structures, buried sewer and water lines, and rock-lined drainages. Most of the vegetation observed consists of invasive species that typically grow in disturbed soils. A geoarchaeological overview and site sensitivity assessment indicates the surface of the APE has high potential for precontact resources, but the potential to encounter buried resources is very low. No new resources were identified on the surface and, based on the pedestrian survey and geoarchaeological sensitivity assessment, there is low potential to encounter significant cultural resources during construction.

36 CFR 800.11(e)(4) – Effects of the Proposed Undertaking

No historic properties are present in the APE, and a finding of no historic properties affected is recommended per 36 CFR § 800.4(d)(1).

36 CFR 800.11(e)(6) – Views of the Public/Consulting Parties

Views of the public, Native Americans, and other interested parties will be considered regarding this undertaking and its potential impacts. Replacement of wastewater treatment lift stations generally does not attract media attention, and it is likely there will be little coverage of this undertaking. But, if there is any public response or any media discussion about the undertaking, all substantial comments related to the protection of historic properties will be shared with the SHPO and this consultation will be reopened.

36 CFR 800.13(b)(3) – Treatment of Unexpected, Post-Review Discoveries

During the execution of this undertaking, if new or unexpected discoveries are made that are related to any known or unknown prehistoric or historic cultural properties, TAFB personnel will conform to the requirements of 36 CFR 800.13. Within 48 hours of the discovery, TAFB personnel will contact the SHPO, the Advisory Council, and any other interested parties to solicit their comments and recommendations and to determine the appropriate actions.

Summary

TAFB is proposing to construct a new wastewater lift station and demolish the existing lift station. The total estimated area of permanent and temporary disturbance would be 31,790 square feet. The cultural resources assessment for the undertaking included a review of records search data, archival research, and a survey of the APE. No resources were identified that could be impacted by the proposed undertaking.

In compliance with Section 106 of the NHPA, your concurrence with the APE as defined for the proposed undertaking and a finding of no historic properties affected is requested. Please forward your written response to this concurrence request to Ms. Leslie Peña, Environmental Chief, 60th Civil Engineer Squadron, 411 Airmen Drive, Travis AFB, California 94535-2176, or contact her by telephone at 707-424-0891 or by email at leslie.pena@us.af.mil. Thank you for your assistance.

Sincerely,

LIN.DAVID.C.1188122392
Digitally signed by LIN.DAVID.C.1188122392
Date: 2024.08.08 13:55:41 -07'00'

David C. Lin, P.E., GS-14 DAFC
Deputy Base Civil Engineer

Three Attachments:
1. Location of Travis Air Force Base
2. Existing and Proposed New Wastewater Lift Station
3. Phase I Archaeological Survey for the Construction of a Lift Station at Travis Air Force Base, Solano County, California, 18 June 2024

Attachment 1

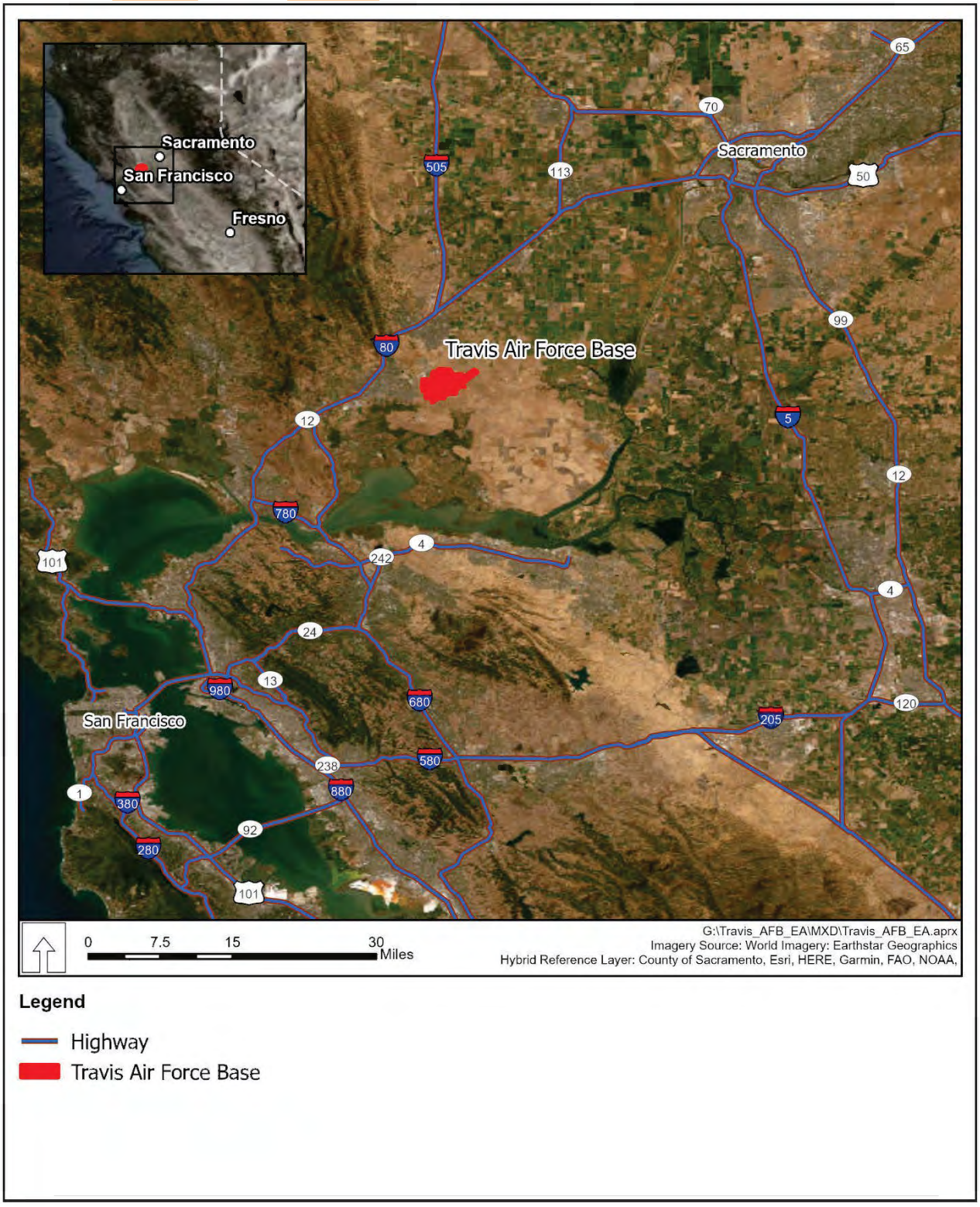

Figure 1. Location of Travis Air Force Base

Attachment 2

Figure 2. Existing and Proposed New Wastewater Lift Station

State of California • Natural Resources Agency
Gavin Newsom, *Governor*

DEPARTMENT OF PARKS AND RECREATION
OFFICE OF HISTORIC PRESERVATION
Armando Quintero, *Director*

Julianne Polanco, State Historic Preservation Officer
1725 23rd Street, Suite 100, Sacramento, CA 95816-7100
Telephone: (916) 445-7000 FAX: (916) 445-7053
calshpo.ohp@parks.ca.gov www.ohp.parks.ca.gov

August 27, 2024

Reply in Reference to: USAF_2024_0809_001

Mr. David C. Lin
Deputy Base Civil Engineer
60th Civil Engineer Squadron
411 Airman Drive, Bldg. 570
Travis AFB CA 94535

VIA ELECTRONIC MAIL

Re: Section 106 Consultation for Lift Station Replacement, Travis Air Force Base, Solano County

Dear Mr. Lin:

The United States Air Force (USAF) is initiating consultation with the State Historic Preservation Officer (SHPO) regarding its effort to comply with Section 106 of the National Historic Preservation Act of 1966 (54 U.S.C. 306108), as amended, and its implementing regulation found at 36 CFR Part 800.

The USAF is proposing to replace the wastewater lift station at Travis Air Force Base. A complete project description may be found in the USAF's supporting documentation.

The current lift station is a component of the wastewater treatment plant constructed in 1946. The plant was formally determined ineligible for NRHP inclusion. The USAF further noted that no identified subsurface archaeological deposits are located within the project area.

The USAF are requesting concurrence with their APE definition and a finding of no historic properties affected. Upon review of the information provided, the SHPO has the following comments:

1. The SHPO has no objection to the USAF's APE definition.

2. The SHPO concurs with the USAF's finding of no historic properties affected. Be advised that under certain circumstances, such as an unanticipated discovery or a change in project description, the USAF may have future responsibilities for this undertaking under 36 CFR Part 800.

This letter is being sent in electronic format only. Please confirm receipt of this letter and notify Ed Carroll, Historian II, at [redacted] if there are any questions or to request a hard copy of this letter.

Sincerely,

Julianne Polanco
State Historic Preservation Officer

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APPENDIX B. AIR QUALITY MODELING RESULTS

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AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.23a

a. Action Location:

Base: TRAVIS AFB
State: California
County(s): Solano
Regulatory Area(s): San Francisco Bay Area, CA

b. Action Title: Environmental Assessment for the Construction of Lift Station, Travis AFB, California

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2025

e. Action Description:

The Proposed Action is to replace the existing wastewater lift station in a manner that ensures the continued and proper treatment of TAFB wastewater. As the continuous treatment of wastewater is essential to mission functions at TAFB, any loss of wastewater treatment function could make the use of potable water and disposal of wastewater impossible. The implementation of the Proposed Action would be a seamless transition from the existing wastewater lift station.

The 60 AMW would replace and construct a new lift station adjacent to the existing lift station, route the piping to the new lift station, then demolish the existing lift station. The new lift station, including a concrete pad, would have a permanent disturbance area of 5,490 square feet. The total temporary disturbance would be 26,300 square feet. Therefore, the total construction work area would be 31,790 square feet. Impacts would also occur from the rerouting of utilities, but those impacts would occur within the work site. A temporary backup generator would be installed at the new pump station.

f. Point of Contact:

Name: Eric Webb
Title: Project Manager
Organization: Vernadero Group Inc.
Email: Redacted
Phone Number: Redacted

2. Analysis: Total reasonably foreseeable net change in direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" (highest annual emissions) and "steady state" (no net gain/loss in emission stabilized and the action is fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

All emissions estimates were derived from various sources using the methods, algorithms, and emission factors from the most current *Air Emissions Guide for Air Force Stationary Sources*, *Air Emissions Guide for Air Force Mobile Sources*, and/or *Air Emissions Guide for Air Force Transitory Sources*. For greater details of this analysis, refer to the Detail ACAM Report.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

____ applicable
_X_ not applicable

Conformity Analysis Summary:

2025

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Francisco Bay Area, CA			
VOC	0.412	100	No
NOx	3.100	100	No
CO	3.747		
SOx	0.006	100	No
PM 10	4.419		
PM 2.5	0.123	100	No
Pb	0.000		
NH3	0.004	100	No

2026 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Francisco Bay Area, CA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000		
SOx	0.000	100	No
PM 10	0.000		
PM 2.5	0.000	100	No
Pb	0.000		
NH3	0.000	100	No

The Criteria Pollutants (or their precursors) with a General Conformity threshold listed in the table above are pollutants within one or more designated nonattainment or maintenance area/s for the associated National Ambient Air Quality Standard (NAAQS). These pollutants are driving this GCR Applicability Analysis. Pollutants exceeding the GCR thresholds must be further evaluated potentially through a GCR Determination.

The pollutants without a General Conformity threshold are pollutants only within areas designated attainment for the associated NAAQS. These pollutants have an insignificance indicator for VOC, NOx, CO, SOx, PM 10, PM 2.5, and NH3 of 250 ton/yr (Prevention of Significant Deterioration major source threshold) and 25 ton/yr for Pb (GCR de minimis value). Pollutants below their insignificance indicators are at rates so insignificant that they will not cause or contribute to an exceedance of one or more NAAQSs. These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Refer to the *Level II, Air Quality Quantitative Assessment Insignificance Indicators* for further details.

None of the annual net change in estimated emissions associated with this action are above the GCR threshold values established at 40 CFR 93.153 (b); therefore, the proposed Action has an insignificant impact on Air Quality and a General Conformity Determination is not applicable.

Eric Webb, Project Manager — Jun 10 2024

Name, Title — **Date**

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: TRAVIS AFB
State: California
County(s): Solano
Regulatory Area(s): San Francisco Bay Area, CA

- Action Title: Environmental Assessment for the Construction of Lift Station, Travis AFB, California

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2025

- Action Purpose and Need:

The purpose of the Proposed Action is to continue to remove wastewater from TAFB. There is no operational wastewater treatment plant on the Base. All wastewater generated by TAFB is treated by the FSSD. The existing lift station is responsible for removing wastewater from TAFB and directing that wastewater to the FSSD force main where it travels to the FSSD wastewater treatment plant.

Constant maintenance is required to keep the current lift station operational. The current lift station has exceeded its life expectancy and will fail in the foreseeable future. The lift station's concrete vault has cracks and is crumbling around the pipe openings; pipes are severely corroded and have developed holes; the lift station pumps have reached the end of their life as one has completely failed; the electrical panels are outdated; and a monitoring device needs to be installed to monitor lift station flow rate, wastewater levels, pumps, and macerator. Failure of the lift station would require TAFB to reduce the use of potable water that would enter the wastewater stream from sinks and toilets and completely eliminate wastewater treatment at the Base, impacting the mission. Therefore, a fully functional and operational lift station is needed to ensure TAFB wastewater is safely and effectively moved to the FSSD sanitary sewer system.

- Action Description:

The Proposed Action is to replace the existing wastewater lift station in a manner that ensures the continued and proper treatment of TAFB wastewater. As the continuous treatment of wastewater is essential to mission functions at TAFB, any loss of wastewater treatment function could make the use of potable water and disposal of wastewater impossible. The implementation of the Proposed Action would be a seamless transition from the existing wastewater lift station.

The 60 AMW would replace and construct a new lift station adjacent to the existing lift station, route the piping to the new lift station, then demolish the existing lift station. The new lift station, including a concrete pad, would have a permanent disturbance area of 5,490 square feet. The total temporary disturbance would be 26,300 square feet. Therefore, the total construction work area would be 31,790 square feet. Impacts would also occur from the rerouting of utilities, but those impacts would occur within the work site. A temporary backup generator would be installed at the new pump station.

- Point of Contact

Name: Eric Webb
Title: Project Manager
Organization: Vernadero Group Inc.
Email: Redacted
Phone Number: Redacted

Report generated with ACAM version: 5.0.23a

- Activity List:

Activity Type	Activity Title

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

2.	Construction / Demolition	Construct New Lift Station

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Solano
Regulatory Area(s): San Francisco Bay Area, CA

- Activity Title: Construct New Lift Station

- Activity Description:
DAF would construct a new lift station adjacent to the existing lift station

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.411574
SO_x	0.006015
NO_x	3.100358
CO	3.746560

Pollutant	Total Emissions (TONs)
PM 10	4.418902
PM 2.5	0.123034
Pb	0.000000
NH_3	0.004384

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.025612
N_2O	0.006276

Pollutant	Total Emissions (TONs)
CO_2	636.380972
CO_2e	638.890984

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.025612
N_2O	0.006275

Pollutant	Total Emissions (TONs)
CO_2	636.375138
CO_2e	638.885092

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Phase Duration
Number of Month: 12
Number of Days: 0

2.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 5490
Height of Building to be demolished (ft): 10

- Default Settings Used: Yes

- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.43930	0.00743	3.63468	4.34820	0.10060	0.09255
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.37086	0.00491	3.50629	2.90209	0.15396	0.14165
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02333	0.00467	575.01338	576.98668

Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02159	0.00432	532.17175	533.99803
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02149	0.00430	529.86270	531.68105

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.12116	0.00282	0.07029	1.02676	0.01490	0.00523	0.03485
LDGT	0.15424	0.00346	0.11335	1.28757	0.01608	0.00572	0.03621
HDGV	0.21462	0.00515	0.19702	1.55314	0.02630	0.00928	0.03700
LDDV	0.02774	0.00226	0.23407	0.33897	0.03158	0.02118	0.00310
LDDT	0.01196	0.00294	0.04640	0.11627	0.02001	0.00960	0.00310
HDDV	0.09271	0.01267	2.29311	0.65497	0.13057	0.06214	0.19767
MC	5.21768	0.00209	0.70725	17.77539	0.01901	0.00802	0.00865

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01022	0.00845	285.42791	288.20031
LDGT	0.01334	0.01073	349.52468	353.05626
HDGV	0.01802	0.01532	520.87880	525.89447
LDDV	0.00129	0.03765	238.95680	250.20804
LDDT	0.00056	0.04890	310.36413	324.94963
HDDV	0.00431	0.21077	1337.79258	1400.70962
MC	0.25278	0.04626	211.49653	231.60241

2.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Site Grading Phase

2.2.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 12
Number of Days: 0

2.2.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 31790
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Site Grading Default Settings

Default Settings Used: Yes

Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.33951	0.00490	2.85858	3.41896	0.15910	0.14637
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.29762	0.00487	2.89075	3.51214	0.17229	0.15851
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.37086	0.00491	3.50629	2.90209	0.15396	0.14165
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02155	0.00431	531.19419	533.01712
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02141	0.00428	527.74261	529.55369
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02159	0.00432	532.17175	533.99803
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				

	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02149	0.00430	529.86270	531.68105

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.12116	0.00282	0.07029	1.02676	0.01490	0.00523	0.03485
LDGT	0.15424	0.00346	0.11335	1.28757	0.01608	0.00572	0.03621
HDGV	0.21462	0.00515	0.19702	1.55314	0.02630	0.00928	0.03700
LDDV	0.02774	0.00226	0.23407	0.33897	0.03158	0.02118	0.00310
LDDT	0.01196	0.00294	0.04640	0.11627	0.02001	0.00960	0.00310
HDDV	0.09271	0.01267	2.29311	0.65497	0.13057	0.06214	0.19767
MC	5.21768	0.00209	0.70725	17.77539	0.01901	0.00802	0.00865

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01022	0.00845	285.42791	288.20031
LDGT	0.01334	0.01073	349.52468	353.05626
HDGV	0.01802	0.01532	520.87880	525.89447
LDDV	0.00129	0.03765	238.95680	250.20804
LDDT	0.00056	0.04890	310.36413	324.94963
HDDV	0.00431	0.21077	1337.79258	1400.70962
MC	0.25278	0.04626	211.49653	231.60241

2.2.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)

HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.3 Trenching/Excavating Phase

2.3.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 12
Number of Days: 0

2.3.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 4000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of	Hours Per Day

	Equipment	
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.3.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.40191	0.00542	3.44643	4.21104	0.10704	0.09848
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.49122	0.00542	3.71341	4.67487	0.13603	0.12515
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.13772	589.15263
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.02637	590.04433
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.86270	531.68105

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.12116	0.00282	0.07029	1.02676	0.01490	0.00523	0.03485
LDGT	0.15424	0.00346	0.11335	1.28757	0.01608	0.00572	0.03621
HDGV	0.21462	0.00515	0.19702	1.55314	0.02630	0.00928	0.03700
LDDV	0.02774	0.00226	0.23407	0.33897	0.03158	0.02118	0.00310
LDDT	0.01196	0.00294	0.04640	0.11627	0.02001	0.00960	0.00310
HDDV	0.09271	0.01267	2.29311	0.65497	0.13057	0.06214	0.19767
MC	5.21768	0.00209	0.70725	17.77539	0.01901	0.00802	0.00865

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01022	0.00845	285.42791	288.20031
LDGT	0.01334	0.01073	349.52468	353.05626
HDGV	0.01802	0.01532	520.87880	525.89447
LDDV	0.00129	0.03765	238.95680	250.20804
LDDT	0.00056	0.04890	310.36413	324.94963
HDDV	0.00431	0.21077	1337.79258	1400.70962
MC	0.25278	0.04626	211.49653	231.60241

2.3.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.4 Building Construction Phase

2.4.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 12
Number of Days: 0

2.4.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 5490
Height of Building (ft): 10
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

2.4.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.20113	0.00487	1.94968	1.66287	0.07909	0.07277
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.26944	0.00487	2.55142	3.59881	0.13498	0.12418
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.58451	529.39505
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.10822	528.91712
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.86270	531.68105

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.12116	0.00282	0.07029	1.02676	0.01490	0.00523	0.03485
LDGT	0.15424	0.00346	0.11335	1.28757	0.01608	0.00572	0.03621
HDGV	0.21462	0.00515	0.19702	1.55314	0.02630	0.00928	0.03700
LDDV	0.02774	0.00226	0.23407	0.33897	0.03158	0.02118	0.00310
LDDT	0.01196	0.00294	0.04640	0.11627	0.02001	0.00960	0.00310
HDDV	0.09271	0.01267	2.29311	0.65497	0.13057	0.06214	0.19767
MC	5.21768	0.00209	0.70725	17.77539	0.01901	0.00802	0.00865

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01022	0.00845	285.42791	288.20031
LDGT	0.01334	0.01073	349.52468	353.05626
HDGV	0.01802	0.01532	520.87880	525.89447
LDDV	0.00129	0.03765	238.95680	250.20804

LDDT	0.00056	0.04890	310.36413	324.94963
HDDV	0.00431	0.21077	1337.79258	1400.70962
MC	0.25278	0.04626	211.49653	231.60241

2.4.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase

VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.5 Architectural Coatings Phase

2.5.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date

Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration

Number of Month: 12
Number of Days: 0

2.5.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information

Building Category: Non-Residential
Total Square Footage (ft^2): 5490
Number of Units: N/A

- Architectural Coatings Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.5.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.12116	0.00282	0.07029	1.02676	0.01490	0.00523	0.03485
LDGT	0.15424	0.00346	0.11335	1.28757	0.01608	0.00572	0.03621

HDGV	0.21462	0.00515	0.19702	1.55314	0.02630	0.00928	0.03700
LDDV	0.02774	0.00226	0.23407	0.33897	0.03158	0.02118	0.00310
LDDT	0.01196	0.00294	0.04640	0.11627	0.02001	0.00960	0.00310
HDDV	0.09271	0.01267	2.29311	0.65497	0.13057	0.06214	0.19767
MC	5.21768	0.00209	0.70725	17.77539	0.01901	0.00802	0.00865

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01022	0.00845	285.42791	288.20031
LDGT	0.01334	0.01073	349.52468	353.05626
HDGV	0.01802	0.01532	520.87880	525.89447
LDDV	0.00129	0.03765	238.95680	250.20804
LDDT	0.00056	0.04890	310.36413	324.94963
HDDV	0.00431	0.21077	1337.79258	1400.70962
MC	0.25278	0.04626	211.49653	231.60241

2.5.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to estimate GHG emissions and assess the theoretical Social Cost of Greenhouse Gases (SC GHG) associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide. This report provides a summary of GHG emissions and SC GHG analysis.

Report generated with ACAM version: 5.0.23a

a. Action Location:

Base: TRAVIS AFB
State: California
County(s): Solano
Regulatory Area(s): San Francisco Bay Area, CA

b. Action Title: Environmental Assessment for the Construction of Lift Station, Travis AFB, California

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2025

e. Action Description:

The Proposed Action is to replace the existing wastewater lift station in a manner that ensures the continued and proper treatment of TAFB wastewater. As the continuous treatment of wastewater is essential to mission functions at TAFB, any loss of wastewater treatment function could make the use of potable water and disposal of wastewater impossible. The implementation of the Proposed Action would be a seamless transition from the existing wastewater lift station.

The 60 AMW would replace and construct a new lift station adjacent to the existing lift station, route the piping to the new lift station, then demolish the existing lift station. The new lift station, including a concrete pad, would have a permanent disturbance area of 5,490 square feet. The total temporary disturbance would be 26,300 square feet. Therefore, the total construction work area would be 31,790 square feet. Impacts would also occur from the rerouting of utilities, but those impacts would occur within the work site. A temporary backup generator would be installed at the new pump station.

f. Point of Contact:

Name: Eric Webb
Title: Project Manager
Organization: Vernadero Group Inc.
Email: Redacted
Phone Number: Redacted

2. Analysis: Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action start through the expected life cycle of the action. The life cycle for Air Force actions with "steady state" emissions (SS, net gain/loss in emission stabilized and the action is fully implemented) is assumed to be 10 years beyond the SS emissions year or 20 years beyond SS emissions year for aircraft operations related actions.

GHG Emissions Analysis Summary:

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO2), methane (CH4), and nitrous oxide (NO2). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of CO2 equivalents (CO2e). The CO2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO2. All GHG emissions estimates were derived from various emission sources using the methods, algorithms, emission factors, and GWPs from the most current Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory Sources.

The Air Force has adopted the Prevention of Significant Deterioration (PSD) threshold for GHG of 75,000 ton per year (ton/yr) of CO2e (or 68,039 metric ton per year, mton/yr) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant (de minimis, too trivial or minor to merit consideration). Actions with a net change in GHG (CO2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Note that actions with a net change in GHG (CO2e) emissions above the insignificance indicator (threshold) are only considered potentially significant and require further assessment to determine if the action poses a significant impact. For further detail on insignificance indicators see Level II, Air Quality Quantitative Assessment, Insignificance Indicators (April 2023).

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected life cycle of the action.

Action-Related Annual GHG Emissions (mton/yr)						
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**	**Threshold**	**Exceedance**
2025	577	0.02323497	0.00569318	580	68,039	No
2026 [SS Year]	0	0	0	0	68,039	No

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

State's Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2025	336,950,322	1,567,526	55,459	338,573,307
2026 [SS Year]	0	0	0	0

U.S. Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2025	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2026 [SS Year]	0	0	0	0

GHG Relative Significance Assessment:

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (yGba.e., global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

The action's surroundings, circumstances, environment, and background (context associated with an action) provide the setting for evaluating the GHG intensity (impact significance). From an air quality perspective, context of an

action is the local area's ambient air quality relative to meeting the NAAQSs, expressed as attainment, nonattainment, or maintenance areas (this designation is considered the attainment status). GHGs are non-hazardous to health at normal ambient concentrations and, at a cumulative global scale, action-related GHG emissions can only potentially cause warming of the climatic system. Therefore, the action-related GHGs generally have an insignificant impact to local air quality.

However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)					
		CO2	**CH4**	**N2O**	**CO2e**
2025-2036	State Total	336,950,322	1,567,526	55,459	338,573,307
2025-2036	U.S. Total	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2025-2036	Action	577	0.023235	0.005693	580
Percent of State Totals		0.00017134%	0.00000148%	0.00001027%	0.00017119%
Percent of U.S. Totals		0.00001124%	0.00000009%	0.00000038%	0.00001122%

From a global context, the action's total GHG percentage of total global GHG for the same time period is: 0.00000150%.*

* Global value based on the U.S. emits 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

Climate Change Assessment (as SC GHG):

On a global scale, the potential climate change effects of an action are indirectly addressed and put into context through providing the theoretical SC GHG associated with an action. The SC GHG is an administrative and theoretical tool intended to provide additional context to a GHG's potential impacts through approximating the long-term monetary damage that may result from GHG emissions affect on climate change. It is important to note that the SC GHG is a monetary quantification, in 2020 U.S. dollars, of the theoretical economic damages that could result from emitting GHGs into the atmosphere.

The SC GHG estimates are derived using the methodology and discount factors in the "Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990," released by the Interagency Working Group on Social Cost of Greenhouse Gases (IWG SC GHGs) in February 2021.

The speciated IWG Annual SC GHG Emission associated with an action (or alternative) are first estimated as annual unit cost (cost per metric ton, $/mton). Results of the annual IWG Annual SC GHG Emission Assessments are tabulated in the IWG Annual SC GHG Cost per Metric Ton Table below:

IWG SC GHG Discount Factor: 2.5%

IWG Annual SC GHG Cost per Metric Ton ($/mton [In 2020 $])			
YEAR	**CO2**	**CH4**	**N2O**

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

2025	$83.00	$2,200.00	$30,000.00
2026 [SS Year]	$84.00	$2,300.00	$30,000.00

Action-related SC GHG were estimated by calendar-year for the projected action's lifecycle. Annual estimates were found by multiplying the annual emission for a given year by the corresponding IWG Annual SC GHG Emission value (see table above).

Action-Related Annual SC GHG ($K/yr [In 2020 $])				
YEAR	**CO2**	**CH4**	**N2O**	**GHG**
2025	$47.92	$0.05	$0.17	$48.14
2026 [SS Year]	$0.00	$0.00	$0.00	$0.00

The following two tables summarize the U.S. and State's Annual SC GHG by calendar-year. The U.S. and State's Annual SC GHG are in 2020 dollars and were estimated by each year for the projected action lifecycle. Annual SC GHG estimates were found by multiplying the U.S. and State's annual five-year average GHG emissions for a given year by the corresponding IWG Annual SC GHG Cost per Metric Ton value.

State's Annual SC GHG ($K/yr [In 2020 $])				
YEAR	**CO2**	**CH4**	**N2O**	**GHG**
2025	$27,966,876.69	$3,448,557.38	$1,663,780.19	$33,079,214.26
2026 [SS Year]	$0.00	$0.00	$0.00	$0.00

U.S. Annual SC GHG ($K/yr [In 2020 $])				
YEAR	**CO2**	**CH4**	**N2O**	**GHG**
2025	$426,325,696.86	$56,379,205.70	$45,021,229.08	$527,726,131.63
2026 [SS Year]	$0.00	$0.00	$0.00	$0.00

Relative Comparison of SC GHG:

To provide additional real-world context to the potential climate change impact associate with an action, a Relative Comparison of SC GHG Assessment is also performed. While the SC GHG estimates capture an indirect approximation of global climate damages, the Relative Comparison of SC GHG Assessment provides a better perspective from a regional and global scale.

The Relative Comparison of SC GHG Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (yGba.e., global, national, and regional) and the SC GHG as the degree (intensity) of the proposed action's effects. The Relative Comparison Assessment provides real-world context and allows for a reasoned choice among alternatives through a relative contrast analysis which weighs each alternative's SC GHG proportionally against (or relative to) existing global, national, and regional SC GHG. The below table provides a relative comparison between an action's SC GHG vs. state and U.S. projected SC GHG for the same time period:

Total SC-GHG ($K [In 2020 $])					
		CO2	**CH4**	**N2O**	**GHG**
2025-2036	State Total	$27,966,876.69	$3,448,557.38	$1,663,780.19	$33,079,214.26
2025-2036	U.S. Total	$426,325,696.86	$56,379,205.70	$45,021,229.08	$527,726,131.63
2025-2036	Action	$47.92	$0.05	$0.17	$48.14
Percent of State Totals		0.00017134%	0.00000148%	0.00001027%	0.00014553%
Percent of U.S. Totals		0.00001124%	0.00000009%	0.00000038%	0.00000912%

From a global context, the action's total SC GHG percentage of total global SC GHG for the same time period is: 0.00000122%.*

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

***** Global value based on the U.S. emits 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

Eric Webb, Project Manager	Jun 10 2024
Name, Title	**Date**

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APPENDIX C. BIOLOGICAL ASSESSMENT AND PROGRAMMATIC BIOLOGICAL OPINION

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C-1 Biological Assessment

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DRAFT BIOLOGICAL ASSESSMENT FOR CONSTRUCTION OF A LIFT STATION, TRAVIS AIR FORCE BASE CALIFORNIA

Prepared for:

60th Civil Engineer Squadron
411 Airmen Drive
Travis Air Force Base
California 93535-2176

and

US Army Corps of Engineers
1325 J Street
Sacramento, California 95814

Prepared by:

VERNADERO GROUP
INCORPORATED

2730 E. Camelback Road
Suite 210
Phoenix, Arizona 85016

Contract W9123822D0020
Task Order W9123823F0073

August 2024

DATE SENT TO USFWS	4 October 2024
PROJECT TITLE:	Construction of a Lift Station, Travis Air Force Base, California
PROJECT PROPONENT:	Department of the Air Force, 60th Civil Engineer Squadron
CEIE POINT OF CONTACT:	Ms. Leslie Pena, Environmental Chief, 707-424-0891, leslie.pena@us.af.mil

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LIST OF ACRONYMS AND ABBREVIATIONS

BA	Biological Assessment
BMP	best management practice
CEIE	Installation Management Flight, Environmental
CES	Civil Engineer Squadron
ESA	Endangered Species Act
FSSD	Fairfield-Suisun Sewer District
GSU	geographic separated units
NRM	Natural Resource Manager
PBO	Programmatic Biological Opinion
TAFB	Travis Air Force Base
USFWS	US Fish and Wildlife Service

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1.0 INTRODUCTION

This Biological Assessment (BA) has been prepared pursuant to Section 7 of the Endangered Species Act (ESA) of 1973 (16 United States Code 1536). Section 7 of the ESA requires consultation with the US Fish and Wildlife Service (USFWS) to determine if federal actions will affect threatened or endangered species and to ensure that any action will not jeopardize the continued existence of any threatened or endangered species.

This BA evaluates the impacts of the proposed replacement of the wastewater lift station at Travis Air Force Base (TAFB), Solano County, California (Figure 1). It also summarizes current data regarding federally listed threatened and endangered species, or species proposed for federal listing as threatened or endangered species on TAFB.

A Programmatic Biological Opinion (PBO; USFWS 2018; 08ESMF00-2017-F-2294-3) for routine activities conducted by TAFB analyzed proposed activities, as a whole, for impacts on six federally listed species and their habitat, four of which are known to occur on TAFB. TAFB proposed specific criteria for projects and activities that will have either no effect (Level 1); may affect, but are not likely to adversely affect (Level 2); and may affect and are likely to adversely affect (Level 3), federally listed species.

TAFB will complete an individual, abbreviated, project-specific analysis for all projects meeting the consultation criteria defined under this framework, as established by the programmatic consultation (Levels 2 and 3). These analyses will follow the Covered Project Analysis Template (i.e., consultation template, which this BA follows) provided as an enclosure to the PBO and includes appropriate conservation measures from the Programmatic BA (TAFB 2018). Specific habitat thresholds have been developed for the four federally listed species known to occur on the main Base and TAFB's eight geographically separated units (GSUs), which are the Central Valley population of the California tiger salamander (*Ambystoma californiense*), Contra Costa goldfields (*Lasthenia conjugens*), vernal pool fairy shrimp (*Branchinecta lynchi*), and vernal pool tadpole shrimp (*Lepidurus packardi*). There are no verified occurrences of either the Conservancy fairy shrimp (*Branchinecta conservatio*) or delta green ground beetle (*Elaphus viridis*) on TAFB or its eight GSUs and would not be affected by the proposed action. The nearest known occurrences for both these species are on the Wilcox Ranch property, located immediately southeast of TAFB. Consultation for potential impacts on vernal pool fairy shrimp and vernal pool tadpole shrimp will occur within 250 feet of known or potential habitat and designated critical habitat for these species.

The proposed action may affect and is likely to adversely affect the California tiger salamander, vernal pool fairy shrimp, and vernal pool tadpole shrimp, and to have no effect on the Contra Costa goldfields. This BA identifies proposed avoidance, minimization, or compensation measures intended to avoid or reduce potential impacts of the proposed construction of the new lift station and demolition of the existing lift station at TAFB that could have an on federally listed species. This BA follows the outline for BAs to be prepared for various categories of actions described in the PBO.

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2.0 PROJECT DESCRIPTION

2.1 Purpose and Need

2.1.1 Purpose for the Action

The purpose of the proposed action is to continue to remove wastewater from TAFB. There is no operational wastewater treatment plant on the Base. All wastewater generated by TAFB is treated by the Fairfield-Suisun Sewer District (FSSD). The existing lift station is responsible for removing large quantities of wastewater from TAFB and directing that wastewater to the FSSD force main, where it travels to the FSSD wastewater treatment plant.

2.1.2 Need for the Action

Constant maintenance is required to keep the current TAFB lift station operational. The current lift station has exceeded its life expectancy and will fail in the foreseeable future. Its concrete vault has cracks and is crumbling around the pipe openings; pipes are severely corroded and have developed holes; the lift station pumps have reached the end of their life as one has completely failed; the electrical panels are outdated; and a monitoring device needs to be installed to monitor the lift station flow rate, wastewater levels, pumps, and macerator. Failure of the lift station would require TAFB to reduce the use of potable water that would enter the wastewater stream from sinks and toilets and completely eliminate wastewater treatment at the Base, impacting the mission. Therefore, a fully functional and operational lift station is needed to ensure TAFB wastewater is safely and effectively moved to the FSSD sanitary sewer system.

2.2 Project Site Location

TAFB is located in Solano County, California, approximately 50 miles northeast of San Francisco, and 40 miles southwest of Sacramento (Figure 1). TAFB was established in 1942 and has hosted numerous missions and aircraft types. TAFB occupies 5,137 acres of land and 357 acres of GSUs and includes 394 buildings.

The existing wastewater lift station (Building 1150) is located in the southeastern portion of TAFB, southeast of the airfield (Figure 2). The lift station pumps approximately 80 percent of the sewage generated by TAFB, which is approximately 0.9 million gallons per day. TAFB has a permit with the FSSD to handle wastewater. The lift station moves wastewater from TAFB to the FSSD force main for treatment at the FSSD wastewater treatment plant. The current configuration of the lift station is less than 20 years old. However, the lift station was not designed as a new facility but is the product of modifying an older lift station. It is located adjacent to a former wastewater treatment plant that was decommissioned more than 20 years ago.

2.3 Proposed Project Description

The existing lift station has four pumps, a backup diesel generator, a macerator, a control panel, a concrete vault, connecting pipes, and a roof. The existing lift station is failing and needs immediate replacement because it was not designed as a new facility but is the product of

modifying an older lift station and has deteriorated substantially. Further, only three of the four pumps are working; there are wet-well concrete spalling (i.e., breaking into smaller pieces), plumbing leaks, and damage and leakage of the diversion box. The lift station's wet well is too small to accommodate peak flows during large rain events; therefore, an old wastewater treatment plant basin is used for the overflow until the peak flows recede. The single davit crane is inoperable. The pumps and comminutor (responsible for reduction of solid materials) are removed from the wet well using a truck-mounted crane. Also, the davit crane is not adjustable and may only be able to lift one of the two pumps next to the comminutor. A Supervisory Control and Data Acquisition and telemetry system that is supposed to continuously send current lift station data and alarms to a central location is currently not working. This forces the 60th Civil Engineer Squadron to send a staff member to visit the lift station daily to make sure it is working properly and that no alarms have sounded (TranSystems 2023). If the lift station fails, wastewater would back up to Building 1 on the opposite side of the airfield.

The proposed action is to replace the existing wastewater lift station in a manner that ensures the continued and proper treatment of TAFB wastewater. As the continuous treatment of wastewater is essential to mission functions at TAFB, any loss of wastewater treatment function could make the use of potable water and disposal of wastewater impossible. The implementation of the proposed action would be a seamless transition from the existing wastewater lift station.

The 60th Air Mobility Wing would replace and construct a new lift station adjacent to the existing lift station, route the piping to the new lift station, then demolish the existing lift station (Figure 2). The new lift station, including a concrete pad, would have a permanent disturbance area of 5,490 square feet. The total temporary disturbance would be 26,300 square feet. Therefore, the total construction work area would be 31,790 square feet. Impacts would also occur from the rerouting of utilities, but those impacts would occur within the work site.

It is anticipated that the construction of the new lift station and demolition of the existing lift station would be accomplished in two years or less. There would be no seasonal construction restrictions except select species-specific conservation measures for seasonal construction limitations described in Chapter 6. The exact equipment used during construction could vary slightly from the projections presented in Table 1, depending on contractor capabilities. However, these estimates provide a basis for analyzing related issue areas such as air quality, noise, and traffic. In addition to the equipment presented in Table 1, three half-ton or three quarter-ton pickup trucks would be used daily during lift station construction for approximately two years, for a total of 2,560 hours. Access to the existing lift station and proposed new lift station would occur along existing roads, including Perimeter Road and Vallejo Road. No new roads would be constructed for access to the lift station construction area.

Table 1. Construction Equipment Assumptions Associated with the Proposed Action

Equipment Type	Equipment Assumption	Horsepower	Assumed Equipment Model Year	Quantity	Total Hours
Bobcat	Bobcat CT2535	35	2019	2	2,560
Compactor	Wacker Neuson WP1540AW - 16.9-inch width, 3372 LB CF, Honda Engine, Water Tank	5	2020	2	2,560
Concrete Truck	Peterbilt 567	335	2015	2	1,280
Dump Truck	2015 Kenworth T400	380	2015	2	2,560
Flatbed	2013 Freightliner Cascadia Flatbed Truck	410	2013	2	2,560
Grader	CAT 140 / 140 AWD - LVR	250	2020	2	2,560

2.4 Action Area

The action area is defined in 50 Code of Federal Regulations §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 proposed TAFB lift station project, the action area encompasses the total construction work area (permanent and temporary impacts area) of 31,790 square feet (Figure 2) and a 250-foot buffer surrounding the total construction work area (Figure 3).

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3.0 60 CES/CEIE ANALYSIS

Data from the TAFB *Integrated Natural Resources Management Plan* (TAFB 2022) and PBO (USFWS 2018) were used to determine the impacts of the proposed project on federally listed species. The proposed project area is located proximate to Union Creek (nonjurisdictional waters) in an area of mostly disturbed uplands dominated by annual grasses (Figure 4) that includes the existing TAFB wastewater lift station (TAFB 2022). One seasonal wetland and two vernal pools have been mapped on TAFB within 250 feet of the proposed project site (Table 2). Union Creek, a perennial stream (PS.SU.757), is also within 250 feet of the proposed project site (see Figure 3). Additionally, California tiger salamander occurrences as well as documented breeding ponds have been mapped within 1,250 feet of the existing lift station (TAFB 2022; Figure 5). Further, the proposed project area is within a portion of TAFB that has been mapped as a high-risk area for the California tiger salamander (TAFB 2022; see Figure 5).

Table 2. Wetlands within the 250-Foot Buffer Zone of the Proposed Construction Area

Wetland	Wetland Type	Area (Square Feet) within 250-Foot Buffer	Area (Acres) within 250-Foot Buffer	Distance (Feet) to Construction Area	Recorded Species in Aquatic Resource	Impact
SW.SU.094	Seasonal Wetland	349.93	0.00803	112.5	None	Indirect
VP.FL.512	Vernal Pool	1,733.31	0.03979	181.8	None	Indirect
VP.FL.513	Vernal Pool	1.55	0.00004	248.9	None	Indirect

3.1 California Tiger Salamander Impacts Consideration

Some seasonal wetlands and vernal pools located on TAFB are known to support the California tiger salamander. Terrestrial habitats consisting of undeveloped annual grasslands are also known to support the California tiger salamander on TAFB. California tiger salamander occurrences and breeding ponds have been documented approximately 1,000 feet southeast of the proposed lift station action area (Figure 5). Therefore, the annual grasslands in the proposed action area provide suitable aestivation habitat for the California tiger salamander. There is no designated critical habitat for the California tiger salamander in the action area.

Ground disturbance and construction activities could result in a loss of upland habitat used by California tiger salamanders for aestivation, dispersal, and foraging. Suitable small-mammal burrows or soil cracks within the proposed project area may contain the California tiger salamander. Proposed project construction activities such as grading, excavation, and compaction risk injury and mortality to California tiger salamanders in small-mammal burrows or soil cracks. Further, trampling or crushing by equipment and worker foot traffic risk injury or mortality to California tiger salamanders in the proposed project area. Open trenches or other excavations may trap California tiger salamanders, putting them at risk of desiccation, predation, and starvation. Construction noise, vibrations, and lighting could bring about behavioral changes, causing them to leave upland refugia.

The proposed project construction would result in 26,300 square feet of temporary and 5,490 square feet of permanent impacts on suitable upland habitat. All areas of upland ground disturbance or exposed soil will be reseeded with a native "weed-free" seed mix approved by the TAFB 60 CES/CEIE. All temporarily affected areas would be returned to their preconstruction state upon completion of the proposed project. TAFB would compensate for loss of suitable upland habitat for the California tiger salamander with preservation in perpetuity and/or restoration of habitat for the species. Temporarily impacted upland habitat will be mitigated at a 0.5:1 ratio (area of habitat preserved to area of habitat impacted), and permanently impacted upland habitat will be mitigated at a 2:1 ratio (area of habitat preserved to area of habitat impacted). Therefore, the area of California tiger salamander upland habitat preservation for compensation of impacts on California tiger salamander habitat would be 24,130 square feet. Furthermore, TAFB would limit the amount of overall basewide permanent and temporary impacts on California tiger salamander habitat to the area limits set in the PBO, which would not be exceeded annually or over a five-year period.

3.2 Contra Costa Goldfields Impacts Consideration

There are no occurrence records of Contra Costa goldfields in the one wetland and two vernal pools within the proposed lift station action area. There is no designated critical habitat for the Contra Costa goldfields in the action area. Ground disturbance near Contra Costa goldfields-occupied habitat could alter surface water flows and microhabitat features, increasing the risk of sedimentation and siltation into nearby pools and wetlands. However, there are no Contra Costa goldfields-occupied wetlands, pools, or swales within 250 feet of the action area. Therefore, there would be no impacts on Contra Costa goldfields.

3.3 Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp Impacts Consideration

Vernal pool fairy shrimp and vernal pool tadpole shrimp have not been detected in the one wetland and two vernal pools within the proposed lift station action area. There is no designated critical habitat for these species in the action area. The wetland and vernal pools would not be impacted directly by construction activities. However, impacts on the wetland and vernal pools, that are suitable habitats for large, listed branchiopods, could occur from ground-disturbing activities and increased impermeable surfaces. Ground-disturbing activities in the watershed of vernal pools are expected to result in siltation when pools fill during the wet season following construction. Construction activities may result in increased sedimentation transport into the habitat for these vernal pool crustaceans during periods of heavy rains. Siltation in pools supporting vernal pool fairy shrimp or vernal pool tadpole shrimp could result in decreased cyst viability, decreased hatching success, and decreased survivorship among early life history stages; thereby reducing the number of mature adults in future wet seasons. Changing the slope or groundcover of the landscape surrounding pools could change their hydrologic regime, altering the biota in the pools. Grading into subsurface soils can accelerate the loss of water from adjacent habitat by mass flow through networks of cracks, lenses of coarser material, animal burrows, or other macroscopic channels.

Although vernal pool fairy shrimp and vernal pool tadpole shrimp have not been detected in the wetlands and pools located within the 250-foot buffer area, they do provide suitable habitat for the species. Therefore, hydrologic and sedimentation impacts on these vernal pools and the seasonal wetland could negatively affect habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp. The proposed action could also impact individual vernal pool fairy shrimp and vernal pool tadpole shrimp, if present.

TAFB will compensate for indirect impacts on suitable vernal pool fairy shrimp and tadpole shrimp habitat by mitigating impacts on existing habitat for these species at a 1:1 ratio. Therefore, TAFB would mitigate for a total of 2,084.79 square feet of habitat for the impacts on seasonal wetlands and vernal pools in the action area. Furthermore, seasonal wetland habitats that occur along roadways will be avoided during all aspects of the proposed projects, reducing potential adverse impacts on vernal pool fairy shrimp and vernal pool tadpole shrimp and their habitat.

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4.0 PROGRAMMATIC BIOLOGICAL OPINION REFERENCE

The PBO describes facility maintenance and demolition activities on page 15. This includes the repair, upgrade, and maintenance of facilities on TAFB, as well as the demolition of degraded, unsafe, and unnecessary facilities. The facility maintenance and demolition activities have a 1-acre ground disturbance footprint for each project, and the new lift station at TAFB has a proposed footprint of 31,790 square feet (0.73 acre). The facility maintenance and demolition activities include the use of heavy equipment, including excavators, bulldozers, dump trucks, pavers, and scrapers.

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5.0 ANALYSIS OF IMPACTS

The maximum area of disturbance is 31,790 square feet (0.73 acre). This includes 5,490 square feet of permanent and 26,300 square feet of temporary impact areas associated with lift station construction. The action area includes the permanent and temporary impact areas and a 250-foot buffer around these impact areas (see Figure 3).

5.1 Impacts on Species

According to Table 1 in the PBO enclosure (USFWS 2018), projects on TAFB that will directly or indirectly affect wetlands and that will occur within 250 feet of known or potential habitat may adversely affect vernal pool fairy shrimp and vernal pool tadpole shrimp. There would be no effect on the delta green ground beetle because the proposed lift station construction area is greater than 1.0 mile from the known habitat for this species (see Figure C-1 in Tab C of the Programmatic BA).

The action area is in a California tiger salamander High Risk Area (Figure 2, PBO). According to Table 2 of the PBO, projects with permanent disturbance of upland habitat in Medium and High Risk Areas and/or temporary ground disturbance of upland habitat within the High Risk Area may adversely affect the California tiger salamander.

5.1.1 California Tiger Salamander

The activities associated with the construction of a new lift station at TAFB may impact California tiger salamanders by displacement or burial. California tiger salamanders could be present in burrows or soil cracks within the action area. All activities that would disturb surface soils would physically destroy existing burrows, soil cracks, and crevices, which may entomb or kill California tiger salamanders that are within them. Incidental mortality or injury through crushing could occur to California tiger salamanders from the movement of construction equipment and vehicles. Therefore, individual California tiger salamanders would likely be killed due to entombment, desiccation, or crushing from the proposed construction activities.

The conservation measures proposed by the TAFB in the PBO should ensure that California tiger salamanders are protected and that the potential for injury is reduced to the extent possible. Estimating the number of California tiger salamander individuals that may be affected by project activities is difficult, given the many variables that govern their responses to various activities and that their population densities throughout TAFB are not well known. Based on the monitoring reports from past projects and the avoidance measures proposed by TAFB, the TAFB anticipates that number of California tiger salamanders affected would be small.

After reviewing the current status of the California tiger salamander, the environmental baseline for the action area, the impacts of the proposed action, and the cumulative impacts, the proposed action may affect, and is likely to adversely affect, the California tiger salamander. Conservation measures that would be implemented and compensation for the temporary and permanent impacts on California tiger salamander upland habitat would reduce these adverse impacts.

5.1.2 Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

No construction activities are proposed to take place directly in vernal pools or seasonal wetlands. No vernal pool fairy shrimp or vernal pool tadpole shrimp have been detected in nearby vernal pools and seasonal wetlands. However, impacts on these three species from ground disturbance within 250 feet of suitable habitat could alter surface hydrology, affecting the hydroperiod of pools and swales, which could cause the eventual loss of suitable vernal pool and seasonal wetland habitats and species occurrences. The implementation of proper species-specific conservation measures as described in the PBO will avoid or minimize habitat alteration and the loss of vernal pool fairy shrimp, as well as vernal pool tadpole shrimp and cysts.

After reviewing the current status of the vernal pool fairy shrimp and vernal pool tadpole shrimp, the environmental baseline for the action area, the impacts of the proposed action, and the cumulative impacts, the proposed action may affect, and is likely to adversely affect, the vernal pool fairy shrimp and vernal pool tadpole shrimp. Conservation measures that would be implemented and compensation for the indirect impacts on vernal pool fairy shrimp and vernal pool tadpole shrimp habitat would reduce these adverse impacts.

5.2 Impacts on Habitat

5.2.1 California Tiger Salamander

Based on the habitat risk map in the PBO, the lift station construction would occur in California tiger salamander High Risk habitat. Ground-disturbing activities in the action area could alter the hydrology, converting a vernal pool or seasonal wetland to a perennial pond, increasing the likelihood of the pond being colonized by predators. Changes in pool or wetland hydrology could expose California tiger salamanders to increased harassment and mortality from predators and possibly lead to their extirpation from a breeding site. The construction of a new lift station and demolition of the old lift station would involve very little change in impermeable surfaces following the completion of all construction activities. It is highly unlikely that seasonal breeding sites would be converted to perennial water bodies as a result of the proposed action. Conservation measures described in the PBO will be implemented to ensure no surface water hydrological changes would occur and that seasonal breeding sites are not substantially altered.

No new roads or changes in operations would occur in the action area. Therefore, there would be no additional risk of vehicle-caused mortalities or habitat fragmentation following the completion of the new lift station construction and old lift station demolition.

5.2.2 Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

Based on the map of the vernal pool conservation areas in the PBO (USFWS 2018), the lift station construction would impact low-value vernal pool conservation areas. Survival of aquatic organisms such as vernal pool fairy shrimp and vernal pool tadpole shrimp are directly linked to the water regime of their habitat (Zedler 1987). Many vernal pools and seasonal wetlands on TAFB are hydrologically connected. Variations in annual precipitation can lead to pools coalescing during wet years and becoming substantially isolated from one another during

drought conditions. Therefore, aquatic habitat may be indirectly affected from the proposed action by trenching, excavation, grading, and addition of impermeable surfaces between aquatic features. The hydrologic regime of vernal pools may be altered due to disturbance of the claypan layer or changing the slope or groundcover of the surrounding landscape. Changes in surface hydrology may alter flow between pools, diminishing their ability to function adequately. Ground-disturbing activities in the watershed of vernal pools could result in siltation when pools fill during the wet season following construction. Construction activities may result in sediment transport into habitat supporting vernal pool fairy shrimp and vernal pool tadpole shrimp during periods of heavy rains. Siltation in pools supporting vernal pool fairy shrimp and vernal pool tadpole shrimp may result in decreased cyst viability, decreased hatching success, and decreased survivorship among early life history stages. These habitat changes could reduce the number of mature adults in future wet seasons.

Therefore, the proposed new lift station construction and old lift station demolition within 250 feet of vernal pools and seasonal wetlands could result in the degradation of vernal pool fairy shrimp and vernal pool tadpole shrimp habitats. Conservation measures described in the PBO will be implemented during and following construction and demolition in the action area to reduce the impacts on these two large, listed branchiopods.

5.3 Cumulative Impacts

Cumulative impacts include the impacts of future state, tribal, local, or private actions that are reasonably certain to occur in the action area. Future federal actions unrelated to the proposed action would require separate consultation under Section 7 of the ESA.

Numerous nonfederal activities adversely affect vernal pool fairy shrimp, vernal pool tadpole shrimp, and California tiger salamander, primarily through the damage or destruction of vernal pools and seasonal wetland habitat, as well as California tiger salamander aestivation habitat. In addition, the same activities that affect these species also affect their critical habitat. Loss and degradation of habitat affecting these listed species with or without USFWS authorization continues as a result of urbanization; road construction and maintenance; utility right-of-way management; flood control projects that may not be funded, permitted, or constructed by a federal agency; and continuing conversion of rangelands to more intensive agricultural crops. Further conversion of habitat could occur from the California Forever initiative, which would result in a large master-planned development between TAFB and the city of Rio Vista. Habitat for large, listed branchiopods is especially at risk from nonfederal projects through the development of upland areas surrounding vernal pools and seasonal wetlands and hydrologic alterations to their watersheds. Even if direct fill of these seasonal wetlands and vernal pools does not occur, the hydrologic and sedimentation patterns from adjacent development can cause these habitats to be no longer suitable for vernal-pool-endemic species.

The California tiger salamander is also adversely affected by ground squirrel reduction and mosquito control, including the planting of nonnative mosquito fish and road-related mortality, respectively. However, there is land surrounding TAFB supporting large vernal pool complexes and supporting California tiger salamanders that is protected through deed restrictions or

conservation easements, which reduce some of these potential adverse impacts. For example, the portion of the Wilcox Ranch adjacent to TAFB is owned by the city of Fairfield and Solano County, and it is subject to deed restrictions that prohibit most kinds of development, protecting vernal pool, seasonal wetland, and California tiger salamander aestivation habitats.

To offset potential impacts from this work, TAFB will compensate for the loss of California tiger salamander habitat with mitigation in conservation banks in Solano County. Temporary loss of California tiger salamander upland habitat will be compensated at a habitat mitigation ratio of 0.5:1 (area of habitat preserved to area of habitat impacted). Permanent impacts on California tiger salamander upland habitat will be compensated at a habitat mitigation ratio of 2:1 (area of habitat preserved to area of habitat impacted). No California tiger salamander breeding habitat would be impacted. Therefore, TAFB would mitigate 24,130 square feet of California tiger salamander habitat.

Similarly, TAFB will compensate for the adverse impacts on suitable vernal pool fairy shrimp and tadpole shrimp habitat with mitigation in conservation banks in Solano County. Construction activities would not occur directly within wetlands or vernal pools, but would occur within 250 feet of one seasonal wetland and two vernal pools. Therefore, impacts on vernal pool fairy shrimp and vernal pool tadpole shrimp habitat will be compensated at a 1:1 mitigation ratio, which would mitigate 2,084.79 square feet of vernal pool habitat.

6.0 SPECIES-SPECIFIC MINIMIZATION MEASURES THAT WILL BE IMPLEMENTED FOR THIS PROJECT

TAFB will implement the following general avoidance and minimization measures from the PBO to avoid and/or minimize potential adverse impacts. The following species-specific conservation measures will also be implemented to avoid and minimize potential adverse impacts on vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamanders, and Contra Costa goldfields.

Monitoring and Surveying

MM-1. A USFWS-approved biologist or 60 CES/CEIE biologist will conduct preconstruction surveys of all ground disturbance areas within and in adjacent sensitive habitat to determine if any federally listed species may be present prior to the start of construction activities. These surveys will be conducted before the start of construction activities in and around any sensitive habitat. If any federally listed species is found during the preconstruction surveys, the USFWS-approved biologist or 60 CES/CEIE biologist will contact the USFWS to determine how to proceed. At least 10 business days before the onset of activities, TAFB will submit the name(s) and credentials of biologists who will conduct these preconstruction surveys if they have not previously received USFWS approval for similar surveys. No project activities will begin until proponents have received written approval from the USFWS that the biologist(s) is qualified to conduct the work.

MM-2. A USFWS-approved biologist or 60 CES/CEIE biologist will monitor construction activities in or adjacent to sensitive habitats as required. The biologist will ensure compliance with all applicable avoidance and minimization measures required to protect federally listed species and their habitats. If federally listed species are found that are likely to be affected by work activities, the USFWS-approved biologist or 60 CES/CEIE biologist will have the authority to stop any aspect of the project that could result in unauthorized take of a federally listed species. If the biologist exercises this authority, he/she must coordinate this with the 60 CES/CEIE, who will notify the USFWS by telephone within one working day and in writing within five working days.

MM-3. A USFWS-approved biologist or 60 CES/CEIE biologist will conduct environmental awareness training for all construction personnel working within and near sensitive habitat on TAFB. Training will be provided at the start of work and within 15 days of any new worker's arrival. The program will consist of a briefing on environmental issues relative to the proposed project. The training program will include an overview of the legal status, biology, distribution, habitat needs, and compliance requirements for each federally listed species that may occur in the project area. The presentation will also include a discussion of the legal protection for endangered species under the ESA, including penalties for violations. A fact sheet conveying this information will be distributed to all personnel who enter the project site. Upon completion of the orientation, employees will sign a form stating that they attended the program and understand all avoidance and minimization measures. These forms will be maintained at TAFB and will be accessible to the appropriate resource agencies.

Buffers and Site Restoration

MM-5. Wetlands, drainages, and vernal pools will have erosion control measures (e.g., straw wattles, silt fencing) installed where hydrological continuity exists between the construction activities and the wetland. A USFWS-approved biologist or 60 CES/CEIE biologist will determine whether erosion control measures should be utilized, weighing the potential for impacts on other species, including the California tiger salamander. Construction boundaries within the buffer will be designated with fencing or other suitable means to ensure no equipment and/or construction workers access protected wetland resources.

MM-6. All areas of upland ground disturbance or exposed soil will be reseeded with a native "weed-free" seed mix approved by the 60 CES/CEIE. Ground disturbance within vernal pools will require a restoration plan and two years of follow-up monitoring by a USFWS-approved biologist or 60 CES/CEIE biologist.

General Measures

MM-7. Off-road travel outside of the demarcated construction will be prohibited.

MM-8. Prior to construction activities, sensitive areas, such as vernal pools, wetlands, riparian areas, and potential habitat for federally listed species, will be staked and flagged as exclusion zones where construction activities will not take place. Orange construction barrier fencing (or an appropriate alternative method) will designate exclusion zones where construction activities cannot occur. The flagging and fencing will be clearly marked as an environmentally sensitive area. The contractor will remove all fencing, stakes and flagging within 60 days of construction completion.

MM-9. Any worker who inadvertently kills or injures a federally listed species, or finds one injured or trapped, will immediately report the incident to the on-site biologist. The biologist will inform the TAFB Natural Resource Manager (NRM) immediately (60 CES/CEIE). The TAFB NRM will verbally notify the Sacramento Fish and Wildlife Office within one day and will provide written notification of the incident within five days.

MM-10. Motor vehicles and equipment will only be fueled and serviced in designated service areas. All fueling and maintenance of vehicles and other equipment and staging areas will occur in a designated area with appropriate spill containment. Any newly established, project-specific fueling and maintenance areas will be located at least 250 feet from any wetland/drainage habitat or water body. Prior to the onset of work, TAFB will ensure a plan to allow a prompt and effective response to any accidental spills is in place. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

MM-11. During construction activities, all trash will be properly contained, removed from the work site daily, and disposed of properly. Following construction, all refuse and construction debris will be removed from work areas. All garbage and construction-related materials in construction areas will be removed immediately following project completion.

MM-12. Unless otherwise designated as part of a habitat restoration plan, all excess soil excavated during construction occurring near vernal pools and other wetlands will be removed and disposed of outside the project area. Coordination with the TAFB Environmental Office and appropriate regulatory agencies is required before disposal of the excavated soil.

MM-13. The number of access routes, number and size of staging areas, and the total area of the activity will be limited to the minimum necessary to achieve the project goal. Routes and boundaries will be clearly demarcated, and these areas will avoid wetlands/drainage areas whenever feasible.

MM-14. All vehicle operators will follow the posted speed limit on paved roads and a 10-mile-per-hour speed limit on unpaved roads.

MM-17. No trenches will be left open at the end of the day; trenched areas will be compacted and restored to normal grade once the project is completed.

MM-18. No work requiring vehicles/equipment will be done when the ground is soft enough that travel will cause depressions.

California Tiger Salamander

CTS-1. Within 14 days of the start of construction activities, a USFWS-approved biologist or 60 CES/CEIE biologist will perform a preconstruction survey and identify potential refuge habitats (burrows) suitable for California tiger salamanders. In the unlikely event that a California tiger salamander is encountered, the biologist will contact the USFWS for instructions.

CTS-2. A USFWS-approved biologist or 60 CES/CEIE biologist will be on the site during all activities that could result in the take of listed species. As outlined in Programmatic BA, Section 1.4.3, the qualifications of the biologist(s) will be presented to the USFWS for review and approval at least 10 working days before any groundbreaking activity at the project site. If any of the requirements associated with these measures are not being fulfilled, the biologist will have the authority to stop project activities through communication with the Project Manager.

CTS-3. Construction personnel will be instructed to exercise caution when commuting within the area to be disturbed.

CTS-4. Construction activities will occur between 30 minutes after sunrise and 30 minutes before sunset unless otherwise specified in the Project Analysis.

CTS-5. At the end of every workday, trenches, pits, and excavations shall be provided with escape ramps constructed of earth fill or wooden planks at a 3:1 slope. Before such trenches, pits, and excavations are filled, they will be thoroughly inspected for trapped wildlife.

CTS-6. If California tiger salamander exclusion barriers or fencing are used, a USFWS-approved biologist or 60 CES/CEIE biologist will be on the site to conduct morning inspections of the barrier fencing before construction activities begin each day of work activity on work days. The barrier will be moved to allow for passage of California tiger salamanders through the

project site, or it will be kept intact and checked within 30 minutes of dawn on nonworkdays (which include weekends and holidays). If a California tiger salamander is observed within or near the barrier fencing, the individual will be relocated outside of the project area following the procedure provided in California Tiger Salamander Relocation Plan, Section 4.4.5, and the Sacramento Fish and Wildlife Office will be contacted.

CTS-7. Seasonal Avoidance/Wet Season Procedures (16 October to 30 April): Work will not be conducted in the rain. The USFWS-approved biologist or 60 CES/CEIE biologist will monitor the weather forecast and authorize work when the forecast indicates a period of dry days (5 to 10 days of no rain) before starting the project. The TAFB Environmental Office will document through email notification to the USFWS when work will commence. The weather forecast and hourly weather data for TAFB will be monitored and can be found by entering the zip code 94535 (TAFB) at http://www.weather.gov/srh. A USFWS-approved biologist or 60 CES/CEIE biologist will be on the site for morning inspections before the start of work. Morning inspections will consist of examination of all trenches, pits, excavations, equipment, California tiger salamander exclusionary barriers (if present), all suitable upland habitat, including refugia habitat such as small woody debris, refuse, burrow entries, etc. will be properly inspected, and all other areas within the project site. In addition, the project work crew will be notified to maintain vigilance regarding California tiger salamander activity. If feasible, the work crew will participate in the morning inspection(s). Modifications to this timing may be approved on a case-by-case basis by the USFWS.

CTS-8. Seasonal Avoidance Dry-Season Rain/High-Humidity Procedures (1 May to 15 October): Work will not be conducted if raining. The USFWS-approved biologist or 60 CES/CEIE biologist will check the National Weather Service by 6:00 AM on the day before a scheduled workday to see if there is a 50 percent or greater probability of rain forecasted overnight. If there is, then before work begins the next morning, the USFWS-approved biologist or 60 CES/CEIE biologist will conduct an even more extensive morning inspection. The inspection will include searching the work area and a wider perimeter of the area for the presence of California tiger salamanders. In addition, the work crew will be notified to maintain vigilance regarding California tiger salamander activity. If feasible, the work crew will participate in the morning inspection(s). Modifications to this timing may be approved on a case-by-case basis by the USFWS. The weather forecast and hourly weather data for TAFB should be monitored and can be found by entering the zip code 94535 (TAFB) at http://www.weather.gov/srh.

CTS-9. If dry-season (1 May to 15 October) nighttime work is necessary, the following additional conservation measures shall be implemented:

a. Work would only occur within paved/gravel areas (greater than 20 feet from uplands).

b. A 6-inch-high California tiger salamander exclusionary barrier will surround the work area during work, with ingress/egress access being the only break in the barrier.

c. A USFWS-approved biologist or 60 CES/CEIE biologist will be onsite during all nighttime work and will routinely monitor the California tiger salamander exclusionary barrier and the project site.

d. Work will not be conducted at nighttime if there is a 50 percent or more chance of rain predicted overnight.

CTS-10. Water shall not be pumped, sprayed, or allowed to flow over undisturbed uplands that can support the California tiger salamander as part of planned project activities outside of preapproved requirements (i.e., dust control). Water applied for preapproved requirements shall be applied in the minimum quantities necessary and only to disturbed soils. If excess water accumulates as a result of construction activity, water may be pumped through a screened pump and removed from the construction area as deemed necessary by the on-site biologist in coordination with TAFB NRM staff. If water inadvertently or purposefully enters construction trenches, pits, or excavations, a USFWS-approved biologist or 60 CES/CEIE biologist will remain on site until water is pumped from the trench, pit, or excavation. Following pumping, the biologist shall inspect the trench, pit, or excavation area and the surrounding uplands to determine if disturbance of California tiger salamanders has occurred and implement any other measures necessary (e.g., placement of cover boards, exclusionary fencing, or barriers) to protect California tiger salamanders that may emerge due to the wet soil.

CTS-11. Pipes laid underground or stored on the ground shall be capped, covered, or taped in a manner that excludes California tiger salamander from entering the pipe before the completion of the construction project. Long-term storage of pipes and other construction material should be placed on asphalt and raised above the ground by no less than 1.5 inches (on top of 2-inch-by-4-inch supports).

CTS-12. Trenches, pits, and excavations shall be covered in a manner that exclude California tiger salamander from entering during weekends, holidays, humid days, rain events, etc. Specifically, gaps no greater than 1 inch shall be allowed within cover materials if biologists will not be present the following day or if rain events or high-humidity days are expected to occur. Before such trenches, pits, and excavations are filled, they will be thoroughly inspected for trapped wildlife.

CTS-13. Salamander exclusionary barriers or fencing may be erected in uplands between aquatic breeding sites and excavation areas if deemed necessary by USFWS personnel, USFWS-approved biologists, or 60 CES/CEIE biologists, to protect the California tiger salamander. Fencing will follow the upland California tiger salamander sampling methodology approved by the USFWS (USFWS 2003) with the following modifications: fencing will be erected perpendicular to the straight pathway that a California tiger salamander would be expected to travel from the aquatic breeding area, toward the construction site, and will extend 100 feet in either direction, beyond the scope of the work area. Pitfall traps will be installed at the ends of the fencing sections and checked daily before sunrise or covered securely when work is not scheduled. Even if traps are covered, the USFWS-approved biologist or 60 CES/CEIE biologist will check exclusionary barriers on the work site on work days and nonwork

days (including weekends and holidays). Alternatively, the fence may be constructed to direct California tiger salamanders away from the project site. In all cases, fencing will be constructed to protect migrating California tiger salamanders from project impacts. Note that the location of the fencing may change during the construction season since California tiger salamander will largely be moving away from breeding ponds in the late spring/early summer but toward breeding ponds in the late fall/early winter.

CTS-14. At the end of the workday, the work site will be enclosed by a 6-inch-high exclusionary barrier (with no gaps), sufficient to prevent California tiger salamander movement onto the work site. A USFWS-approved biologist or 60 CES/CEIE biologist will monitor the installation of the barrier to ensure its integrity and will inspect the barrier during morning inspections before the start of work. The exclusionary barrier may be removed after the morning inspection and then reinstalled at the end of the workday, but only after the USFWS-approved biologist has inspected the work area to be reenclosed. The USFWS-approved biologist will check exclusionary barriers on the work site on workdays and nonworkdays (including weekends and holidays).

CTS-15. If California tiger salamanders are expected to be moving at the ground surface during construction activity, thermally stable cover boards may be placed at a frequency and in a configuration that will allow California tiger salamanders to encounter them prior to reaching the construction area. If cover boards are placed, they will be checked daily by a USFWS-approved biologist or 60 CES/CEIE biologist. California tiger salamanders collected will be moved to the designated California tiger salamander relocation area. Refer to the California Tiger Salamander Relocation Plan (Section 4.4.5) for the designated upland habitat nearest the project site.

CTS-16. Erosion Control Best Management Practices (BMPs) implemented in accordance with the TAFB Storm Water Pollution Prevention Plan will be placed so as not to create a hazard to the California tiger salamander.

CTS-17. A USFWS-approved biologist or 60 CES/CEIE biologist shall perform construction site inspections to ensure the contractor completes the proposed action as described and complies with all proposed minimization measures.

CTS-18. Concrete waste and water from curing operations will be collected in washouts and will be disposed of properly and not allowed into the watercourses or into California tiger salamander upland habitat.

CTS-19. If California tiger salamanders are encountered on the project site, the USFWS-approved biologist or 60 CES/CEIE biologist will contact the TAFB NRM who will then contact the USFWS. If California tiger salamanders are captured, they should be released as near as possible to the point of capture, in a manner that maximizes their survival. Refer to Section 4.4.5 of the California Tiger Salamander Relocation Plan.

Vernal Pool Crustaceans and Contra Costa Goldfields

VP-3. Projects that occur on road surfaces and along road shoulders will avoid direct impacts on wetland habitats that are not detailed in this project analysis.

VP-4. A USFWS-approved biologist or 60 CES/CEIE biologist will mark vernal pool species' habitat and a reasonable buffer to be avoided with flagging material. The area will be protected by placing construction fencing or other appropriate protective fencing around the pools including a buffer. Fencing will be used in locations where project equipment and/or personnel will be situated adjacent to or in the near vicinity of suitable vernal pool species habitat. If in a High- or Medium Risk California tiger salamander area, small-mammal burrows will be avoided when placing stakes or posts.

VP-6. If feasible, equipment used in projects requiring access to sites within vernal pool species' habitat will be situated outside of the habitat. To further minimize adverse impacts, the following measures will be implemented at these sites:

a. No work shall occur within vernal pool habitat when water is present.

b. Ground disturbances such as trenching, and permanent disturbances such as pole installation, will avoid hydrologically connected areas where feasible.

c. As necessary, a USFWS-approved biologist or 60 CES/CEIE biologist will be present during access and project work within vernal pool habitat.

d. For projects adjacent to vernal pool species' habitat or hydrologically connected to the habitat, silt fencing or other appropriate BMPs to prevent siltation shall be implemented prior to work within that area. A USFWS-approved biologist or 60 CES/CEIE biologist will flag areas where silt fencing or BMPs shall be implemented. BMPs may include sandbags and weed-free straw bales or straw wattles. The biologist will consider potential impacts to California tiger salamander in Medium and High Risk areas when recommending erosion control measures.

e. Spill containment kits will be present at all sites where petroleum-fueled equipment is used.

VP-8. Pre- and post-project surveys will quantify total habitat disturbances for annual and cumulative records for the USFWS and TAFB's Integrated Natural Resources Management Plan. This quantification of habitat disturbance will specifically address the acreage of impacts to hydrologically connected habitats and acreage of impacts to vernal pools.

6.1 Species-Specific Minimization Measures which Will Not Be Implemented for This Project

Table 3 provides the list of general minimization and species-specific conservation measures that will not be implemented for the TAFB lift station project.

Table 3. Minimization and Conservation Measures Not to Be Implemented

Measure Category	Measure Not to Be Implemented	Rationale/Description of Measure Not to Be Implemented
General Minimization Measures (Programmatic BA, Section 1.5)	MM-4	USFWS notification of work and impacts are already included in this BA.
Species-Specific: Vernal Pool Listed Species (Programmatic BA, Tab B)	VP-1	USFWS notification of work and impacts are already included in this BA.
Species-Specific: Vernal Pool Listed Species (Programmatic BA, Tab B)	VP-2	There would be no mowing proximate to vernal pools or seasonal wetlands under the Proposed Action.
Species-Specific: Vernal Pool Listed Species (Programmatic BA, Tab B)	VP-5	There would be no herbicide spraying proximate to vernal pools or seasonal wetlands under the proposed action.
Species-Specific: Vernal Pool Listed Species (Programmatic BA, Tab B)	VP-7	Proposed project construction equipment would not encroach on vernal pools or seasonal wetlands.

BA – Biological Assessment; **USFWS** – U.S. Fish and Wildlife Service

7.0 SUMMARY

TAFB has determined that the proposed project should be considered and authorized for action because:

a) The project fits within the scope of the actions described in the PBO.
b) The impacts analyzed are similar to those analyzed in the PBO.
c) Sensitive time periods for listed species will be avoided to the extent practicable.
d) All pertinent minimization measures described in the PBO will be implemented.

We request concurrence from the USFWS within 30 days of the date of this document. This project will also be discussed and/or listed in our annual report.

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8.0 REFERENCES

TranSystems. 2023. *Replace Lift Station B1150, 95% Submittal – Design Analysis, Travis Air Force Base, California.* Project No. XDAT 21-1031. Delivery Order No. FA442722F0088. 31 March.

Travis Air Force Base (TAFB). 2022. *US Air Force Integrated Natural Resources Management Plan.* Final.

Travis Air Force Base (TAFB). 2018. *Programmatic Biological Assessment: Effects of Activities Conducted at Travis Air Force Base, California, on Six Federally Threatened and Endangered Species.* March.

US Fish and Wildlife Service (USFWS). 2003. *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander*. Sacramento, California.

US Fish and Wildlife Service (USFWS). 2018. *Programmatic Formal and Informal Consultation on the Proposed Impacts of Activities Conducted at Travis Air Force Base on Six Federally Threatened and Endangered Species, Solano County, California.* (PBO; 08ESMF00-2017-F-2294-3). June.

Zedler, P.H. 1987. *The Ecology of Southern California Vernal Pools: a Community Profile.* US Fish and Wildlife Service Biological Report 85 (7.11).

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FIGURES

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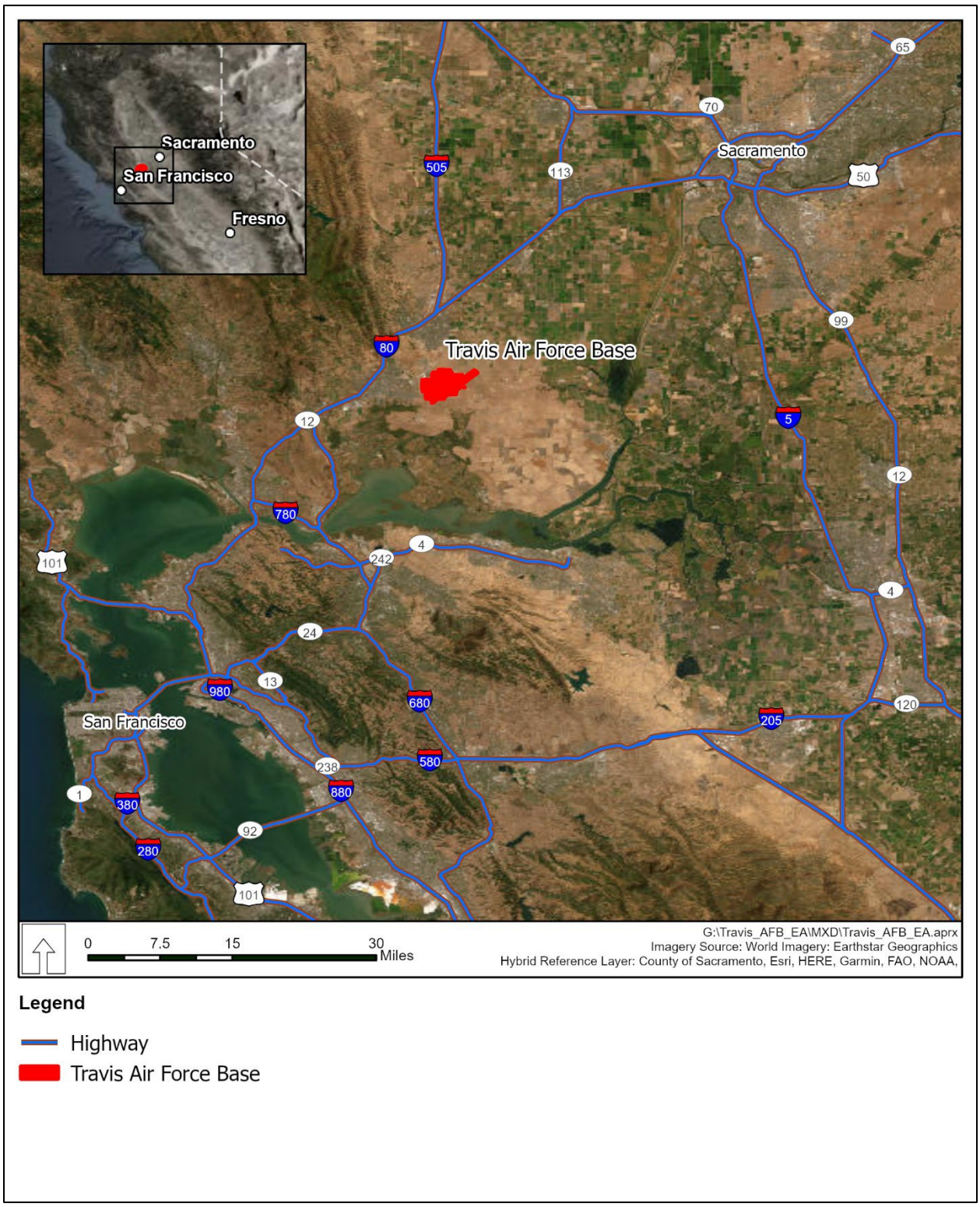

Figure 1. Location of Travis Air Force Base, California

Figure 2. Location of the Proposed New Lift Station at Travis Air Force Base

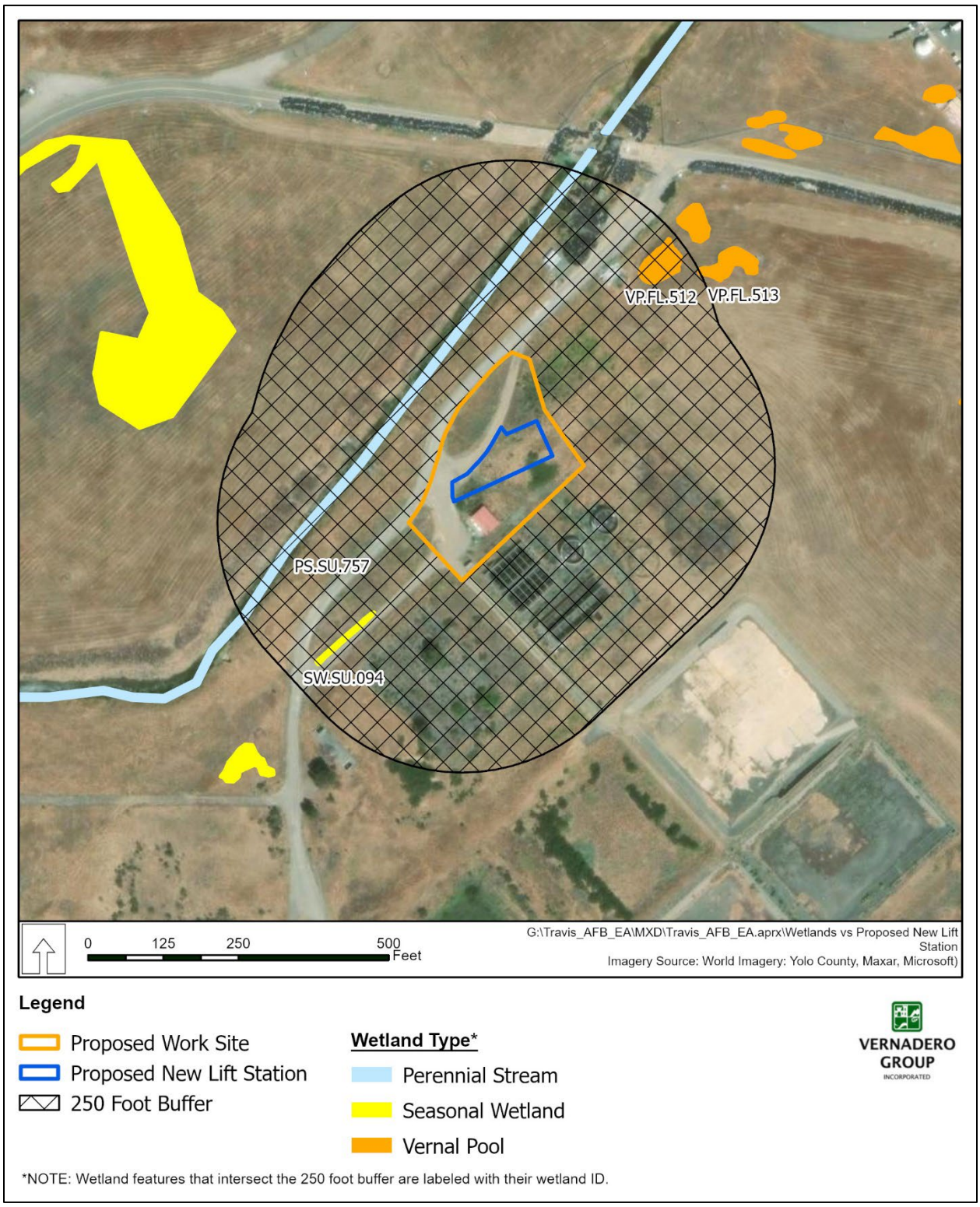

Figure 3. Proposed Project Buffer and Wetland Habitats Proximate to the Proposed Lift Station

Figure 4. Photograph of the Vegetation Present at the Proposed Lift Station Site

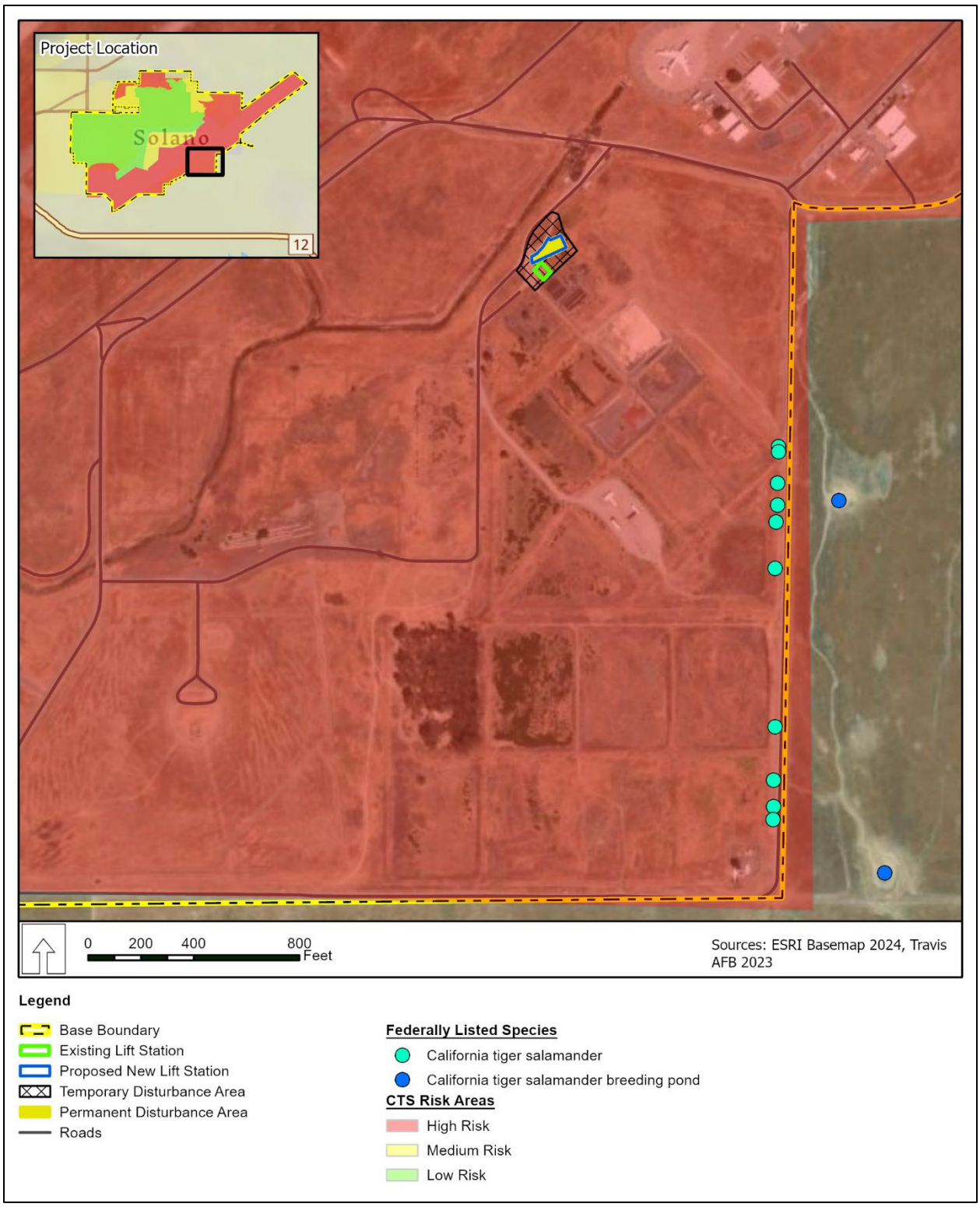

Figure 5. California Tiger Salamander and Breeding Pond Occurrences Proximate to the Proposed Lift Station

C-2 Programmatic Biological Opinion

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

In Reply Refer to:
08ESMF00-
2017-F-2294-3

JUN 0 1 2018

Brian L. Sassaman
60th Civil Engineer Squadron
Flight Chief, Installation Management
411 Airman Drive, Building 570
Travis Air Force Base, California 94535-2001

Subject: Programmatic Formal and Informal Consultation on the Proposed Effects of Activities Conducted at Travis Air Force Base on Six Federally Threatened and Endangered Species, Solano County, California

Dear Mr. Sassaman:

This letter is in response to your March 30, 2017, letter requesting initiation of formal and informal programmatic consultation with the U.S. Fish and Wildlife Service (Service) for the proposed Effects of Activities Conducted at Travis Air Force Base on Six Federally Threatened and Endangered Species, California (proposed projects/activities). The proposed projects include typical activities that will be authorized as a framework programmatic action. Your request, which included the March 2017 document titled *Programmatic Biological Assessment: Effects of Activities Conducted at Travis Air Force Base, California, on Six Federally Threatened and Endangered Species* (programmatic biological assessment) was received by the Service via email on March 30, 2017. However, the request and the programmatic biological assessment were insufficient to initiate consultation. On June 12, 2017, the Service requested additional information needed (2017-F-2294-1). On July 11, 2017, and May 01, 2018, the Service received emails from Travis Air Force Base (Travis AFB) providing the additional information requested. All of the necessary information was received and consultation commenced on May 01, 2018. This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR 402).

The federal action that you requested consultation on is for typical activities which will be conducted over the next 5 years at Travis AFB and at its eight geographically separated units (GSUs) (see Figure 1 of the Enclosure). These activities are necessary for the functioning of the Base, and are divided into the following four core programs: Mission Operations; Infrastructure Support; Infrastructure Development; and Environmental Management. The programmatic biological assessment describes categories of activities related to construction of new facilities, operations and maintenance, flight-related activities, and restoration activities that will occur in accordance with these core programs.

The programmatic biological assessment presents an evaluation of the proposed project's effects on species federally-listed. At issue are the proposed project's effects on the federally-listed as threatened Central Valley population of the California tiger salamander (*Ambystoma californiense*) (California tiger salamander), vernal pool fairy shrimp (*Branchinecta lynchi*), Contra Costa goldfields

(*Lasthenia onjugens*); delta green ground beetle (*Elaphrus viridis*); as well as the federally-listed as endangered vernal pool tadpole shrimp (*Lepidurus packardi*), and the Conservancy fairy shrimp (*Branchinecta conservatio*) and critical habitat designated for these species.

The following sources of information were used to develop this programmatic biological opinion: (1) the programmatic biological assessment for the proposed projects; (2) Travis AFB's *Integrated Natural Resource Management Plan*, dated July 2016; (3) additional information provided by Travis AFB in a response letter dated July 11, 2017; (4) emails, phone conversations between representatives of the Service, Travis AFB, and consulting biologists; and (5) other information available to the Service.

Consultation History

March 30, 2017	The Service received a letter from Travis AFB requesting initiation of formal and informal programmatic consultation for the proposed projects.
June 12, 2017	The Service sent a letter to Travis AFB requesting additional information needed regarding the proposed projects potential affects to federally-listed species.
July 11, 2017	The Service received the information requested on June 12, 2017, from Travis AFB for the proposed projects.
March 16, 2018	The Service received a request from Travis AFB to add further information to the proposed project. This information provided acreages of "low, medium, and high value habitat suitability areas" for the federally-listed species covered in this consultation.
ay 01, 2018	The Service received a request from Travis AFB to update Table 6: *Summary Effects Determination for Federally-Listed Species,* provided in the programmatic biological assessment.

Programmatic Section 7 Consultation Approach

The programmatic biological assessment submitted for routine activities conducted by Travis AFB analyzes proposed activities as a whole, for impacts to the six federally-listed species and their habitat. Based upon this analysis, Travis AFB proposes specific criteria within this document for proposed projects and activities that will have either have **no effect** (Level 1); **may affect, but s not likely to adversely affect** (Level 2); and **may affect and s likely to adversely affect** (Level 3), federally-listed species.

All projects meeting the consultation criteria defined under this framework, established by this programmatic consultation (Levels 2 and 3), will have individual abbreviated project-specific analysis completed by Travis AFB, following the *Covered Project Analysis Template* (consultation template) provided in the Enclosure, and explained in detail in Appendix B of the programmatic biological assessment. Specific habitat effect thresholds have been developed for the four federally-listed species known to occur on the main Base and its GSUs and is provided in Tables 1 and 2 of the Enclosure. Because there are no verified occurrences of either the Conservancy fairy shrimp or delta green ground beetle on Travis AFB or its GSUs; informal consultation for potential effects to Conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp, will occur within 250 feet of known or potential habitat, and designated critical habitat for this species (See Tabs A, B and F of the programmatic biological assessment). Similarly, informal consultation

for potential effects to the delta green ground beetle and its potentially suitable habitat will be limited to projects conducted which may affect potentially suitable habitat, located ≤ 1 mile, from known occurrences or potential habitat, or is located within 250 feet of critical habitat designated for this species (See Tab C of the programmatic biological assessment). Informal consultation will occur on projects within medium (yellow) and some high (red) risk California tiger salamander areas (see Table 2-Level 2 activities included in the Enclosure).

For each project, Travis AFB will implement conservation measures pertinent to the project, in order to avoid or minimization potential effects to species and their habitat. Within this framework the following three possible effect levels are possible:

- The first level is "**no effect**" on any federally-listed species discussed in this document (Table 1-Level 1, and Table 2-Levels 1a and 1b of the Enclosure). Level 1 activities (no effect) will not require further analysis or reporting to the Service. It applies to all situations where none of the federally-listed species with the potential to occur on Travis AFB are likely to be present, within the proposed action area, or the nature of the activity itself will have no effect on federally-listed species and their habitat.

- The second level is "**may affect, not likely to adversely affect**" federally-listed species (Level 2 in Table 1 and 2 of the Enclosure). This level refers to those activities that are not likely to adversely affect federally-listed species, or their habitat. These effects on species are expected to be discountable, insignificant, or entirely beneficial. This level of effect will apply to all proposed projects where the implementation of avoidance and minimization measures (section 1.5 of the programmatic biological assessment), and species-specific measures (Tabs A-F of the programmatic biological assessment) will ensure project's activities are not likely to adversely affect a federally-listed species, or their habitat.

  Travis AFB will complete the consultation template for Level 2 projects. The completed consultation template and any other pertinent information will be mailed or emailed to the Service at least 30 days prior to project start date. The completed consultation template will be addressed to the Assistant Field Supervisor, Doug Weinrich at the Sacramento Fish and Wildlife Office (SFWO). The Service will respond within 14 days if we do not concur with the Base' determination, and will provide an explanation as to why the Service does not concur.Level 2 projects that meet the requirements described in this programmatic biological opinion will be appended on an annual basis, after the Service receives an annual report from Travis AFB requesting to have Level 2 projects that were completed the prior year appended to the biological opinion. Although no habitat compensation will be required for projects that fit these criteria; appropriate general minimization measures (*Conservation Measures* section), and species-specific avoidance measures (Tabs A-C, E and F of the programmatic biological assessment) will be implemented to avoid potential adverse effects to federally-listed species. Project effects located >100 feet from all wetlands will be summarized and retained by the Base, and will be submitted in the Level 2 annual report to the Service.

- The third level is "**may affect, likely to adversely affect**" federally-listed species (Level 3 in Tables 1 and 2 of the Enclosure), and their habitat. This level refers to proposed projects that are likely to directly or indirectly adversely affect the federally-listed species or their critical habitat present (Table 6 of the Enclosure). This level of effect will require formal consultation prior to project implementation, adhering to this programmatic framework, and will include a project-specific analysis following the consultation template. Travis AFB will

mail or email projects requested to be appended to this programmatic biological opinion to the Assistant Field Supervisor, Doug Weinrich at the SFWO. The Service will issue a biological opinion after all necessary information is received, which will include a project-specific incidental take statement (ITS), if it is determined that a project covered under this programmatic biological opinion is likely to adversely affect federally-listed species. The appended biological opinion will include a project-specific ITS; if take is reasonably certain to occur, and will also document any changes to species data (e.g., species occurrences) since issuance of this document. Before a biological opinion can be appended to this programmatic biological opinion, the Service will determine that: (1) the proposed project's activities are within the scope of the activities described in the programmatic biological assessment; (2) the potential effects of the proposed action are consistent with those analyzed in this programmatic biological opinion; and (3) the appropriate conservation measures will be implemented.

Activities that will have o Effect on the Species and Informal Consultation on Categorical Activities that May Affect but are Not Likely to Adversely Affect the Species

Background and Federally-listed Species

In their programmatic biological assessment, Travis AFB determined that many activities typically conducted on the Base and its eight GSU's will either not effect or are not likely to adversely affect the California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, Conservancy fairy shrimp, Contra Costa goldfields and the delta green ground beetle, and their critical habitat; Travis AFB requests our concurrence with the this determination. In addition, Travis AFB determined that certain activities proposed to occur on the Base and its eight GSU's are likely to adversely affect vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, and Contra Costa goldfields. These activities are evaluated in the programmatic biological opinion that follows. Activities which are not likely to adversely affect these federally-listed species or their habitat are described in the sections below and are summarized in Tables , , and 6.

Typical activities performed at Travis AFB that are likely to trigger section 7 consultation requirements are described in the sections below, and in the *Description of the Proposed Action* section included in the following biological opinion. Several guiding conservation principles apply to the implementation of all projects, regardless of habitat types and species, and are engrained in an ecosystem approach for the management of natural resources and the conservation of federally-listed species. As such, Travis AFB has developed, and will implement, general avoidance and minimization measures, and general conservation measures described below under *Conservation easures.* In addition to these measures, species-specific conservation measures described in Tabs A-F of the programmatic biological assessment may apply to some projects and activities to avoid or minimize potential impacts. This will be determined during the project analysis conducted by Travis AFB's Natural Resource Management Team (60 CES/CEIE) following the consultation template, titled *roject Effects Analysis Report Template* (consultation template) provided in the Enclosure.

Conservancy ai ry Shrimp and its Critical abitat

Surveys for special status invertebrates have not detected Conservancy fairy shrimp on Travis AFB (CH2M Hill 2006). However, nine occurrences of this species have been reported within 3 miles of Travis AFB, including seven locations on the Wilcox Ranch; located immediately southeast of the Base, California Natural Diversity Database (CNDDB) 2016). Limited habitat is present on Travis AFB for Conservancy fairy shrimp because it is most often found in large, deep, pools that typically remain ponded late into the spring (June). Critical habitat for Conservancy fairy shrimp occurs on the main Base at the South Gate; a triangular parcel south of Runway 03R/21L not within the

fenced boundary of the Base; and south of Runway 03R/21L (See Figure 3 of the Enclosure). In the Solano-Colusa Vernal Pool Region, Conservancy fairy shrimp are reported as occurring in Olcott Lake at Jepson Prairie about 6 miles east of Travis AFB. Presence of this species has been documented off-Base on the Muzzy Ranch and Wilcox Ranch (CNDDB 2015). In the Solano-Colusa region, Conservancy fairy shrimp populations are protected from development on some locations at the Jepson Prairie Preserve. Other occurrences of the species on private land in this region are threatened by development, particularly in the rapidly urbanizing areas of Fairfield and Vacaville (Service 2005).

Although Travis AFB does not believe the Conservancy fairy shrimp occurs on the Base or its eight GSUs, conservation measures and avoidance and minimization measures will be implemented to ensure this species and its habitat are not affected. Specifically, all projects occurring within 250 feet of known or potential Conservancy fairy shrimp habitat, will implement appropriate general minimization measures. See *Conservation Measures* section for general avoidance and minimization measures, and species-specific avoidance measures (Tab F of the programmatic biological assessment) to avoid potential adverse effects to the species and its habitat.

For each project area within designated critical habitat, Travis AFB will evaluate whether the physical and biological features (PBFs) of critical habitat for the Conservancy fairy shrimp are present, and may be adversely affected with project implementation which would require separate section 7 consultation for potential adverse effects to this species and its critical habitat (See Figure 4 of the Enclosure for a map of designated critical habitat). The PBFs considered to be essential to the conservation and survival of Conservancy fairy shrimp are: (1) topographic features characterized by mounds and swales and depressions within a matrix of surrounding uplands; (2) depressional features including isolated vernal pools with underlying restrictive layers that become inundated during winter rains and that continuously hold water for a minimum of 18 days in all but the driest years; (3) sources of food, expected to be detritus occurring in the pools; and (4) structure within the pool consisting of organic and inorganic materials that provide shelter (USFWS 2005).

Because the Conservancy fairy shrimp has not been identified on Travis AFB or its GSU's, activities proposed in the programmatic biological assessment are not expected to result in adverse effects to the species. However, Travis AFB routinely monitors the status of listed species on its properties and will continue to monitor for Conservancy fairy shrimp as necessary. If at any time this species is detected by surveys, Travis AFB will immediately contact the Service to initiate discussions on how best to proceed regarding the revised status of the species and whether proposed project activities may affect the species or its habitat.

Delta Green Ground Beetle and its Critical Habitat

The closest known population of the delta green ground beetle to Travis AFB is located about 1,500 feet off-Base in playa pools on the Wilcox Ranch, owned by the City of Fairfield and Solano County (adjacent to the eastern boundary of Travis AFB; CNDDB 2016). The delta green ground beetle has been recorded in a total of 18 playas on the eastern portion of the Wilcox Ranch. It is important to note that not all playas on the western Wilcox parcel have been surveyed for this species, and additional suitable habitat exists closer to Travis AFB. Other playa pools on private lands adjacent to Travis AFB have the potential to provide habitat for this species, but surveys have not been conducted or reported to CNDDB.

A habitat assessment on Travis AFB was conducted for the delta green ground beetle in 2012 by Dr. Richard Arnold, who found no evidence of appropriate habitat for this species. Dr. Jaymee Marty also conducted surveys for this species on the Base in 2016, as a follow up survey and reached the same conclusion: that no suitable habitat for the species was present. While appropriate habitat for the delta green ground beetle likely does not exist on the main Base at Travis AFB, critical habitat for the species was designated over lands owned by Travis AFB at the former Sacramento Northern Railroad Right-of-Way GSU. Additionally, because little is known about the ecology of the species including dispersal distances and upland habitat use, Travis AFB has established a 1-mile buffer around known and potential delta green ground beetle habitat. Projects within the 1-mile buffer will consider the delta green ground beetle in informal project consultation. The buffer for potential delta green ground beetle is based on buffers used for critical habitat around Olcott Lake and habitat polygons shown in the CNDDB for the species (See Figure C-1 in Tab C of the programmatic biological assessment). This is also based on the assumption that surveys of potential delta green ground beetle habitat on private lands adjacent to the Base have not been extensive. Because little is known about the life history, particularly dispersal distances of this species and use of upland habitat surrounding vernal pools, Travis AFB has determined that the larger buffer is warranted.

Travis AFB anticipates projects proposed within designated critical habitat for the delta green ground beetle and in areas within 1 mile of known habitat for this species, will have no effect or are not likely to adversely affect the species or its habitat (See Figure 4 for a map of designated critical habitat). However for projects proposed within designated critical habitat for the delta green ground beetle, Travis AFB will evaluate whether the PBFs of the critical habitat are present and may be adversely affected, requiring separate section 7 consultation for potential adverse effects to this species and its critical habitat. The PBFs considered essential to the conservation and survival of this species are: (1) vernal pools with their surrounding vegetation; and (2) land areas that surround and drain into these pools (USFWS 2005). f activities are proposed in designated critical habitat for the delta green ground beetle on Travis AFB GSU Former Sacramento Northern Railroad-Right-of-Way, separate section 7 consultation will be completed for the proposed project.

Because Travis AFB lacks suitable habitat for the delta green ground beetle, activities proposed in the programmatic biological assessment are not expected to result in effects to the species or its habitat. Travis AFB will conduct future surveys if new information comes to light that alters the scientific understanding of this species habitat requirements and changes the likelihood of its potential to occur on Base. At this time, Travis AFB does not believe the species exists on the Base, but will conduct future surveys if new information is found that changes the scientific understanding of the species' habitat requirements and changes the likelihood of its potential to occur on the Base.

California Tiger Salamander, Vernal Pool airy Shrimp, Vernal Pool Tadpole Shrimp, and ontra osta Goldfields and their Critical Habitat

See the *nvironmental aseline* section in the following biological opinion for details on these species occurrences, and potential suitable habitat, including critical habitat for the California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields for which Travis AFB has determined are not likely to be adversely effected by the activities described in this section.

Categorical Activities that will have No Effect on Federally-Listed Species and their Habitat

Travis AFB has determined that there will be **no effect on California tiger salamander or ts abitat** on projects located within low (green) risk CTS areas. See Appendix A of the programmatic biological assessment for the CTS risk analysis and model used at Travis AFB. n the analysis,

Travis AFB designated and defined areas on the Base as either having a low, moderate or high potential for supporting CTS. For simplicity of interpreting the three levels for potential risk for CTS, the corresponding colors are used to describe these risk levels: green (low), yellow (medium) and red (high). A map of the green, yellow, and red risk areas are depicted in Figure 2 of the Enclosure. No effect projects will include activities completed between May 1 and October 15, occurring on paved or gravel surfaces and shoulders, and projects that utilize all equipment and leave excess soil on paved or gravel surfaces. Additionally, with the incorporation of avoidance and minimization measures Travis AFB has determined that there will be no effect on California tiger salamander or its habitat on projects: occurring on paved or gravel surfaces and shoulders in green or yellow risk CTS areas from October 16 – April 30, and/or projects having temporary and permanent disturbances in upland habitat in green risk CTS areas See Table 2; Levels 1a, and 1b of the Enclosure for a list of the avoidance and minimization measures which will be implemented for these activities. No effect activities do not require consultation with the Service.

In addition, with the incorporation of avoidance and minimization measures, Travis AFB has determined that the following activities will have **no effect on the vernal pool fairy shrimp, vernal pool tadpole shrimp, Conservancy fairy shrimp, Contra Costa goldfields, and the delta green ground beetle or their abitat:** on projects that will occur on paved or gravel surfaces, and/or are within paved or graveled road shoulders; and/or work located >250 feet from a wetland (see Table 1; Level 1 of the Enclosure). As a conservation measure, Travis AFB will ensure that all equipment and excess soil will be contained on the project site and will stay on either paved or surfaces.

Mowing

Travis AFB has determined that mowing activities will provide beneficial effects to federally-listed species and their habitats when completed during the dry season (May 1 October 15). Additionally, if mowing occurs in or near vernal pools, it will occur only when the soil is no longer saturated to ensure tracks are not left in or near wetlands. Mowing activities will avoid California tiger salamander breeding ponds during the spring and early summer months in efforts to avoid any effects to this species.

Mowing occurs in both landscaped areas and natural habitat throughout the Base on about 2,900 acres (Figure 8 of the Enclosure). Routine mowing occurs for safety and security reasons around the airfield munitions storage facilities, and along roadway shoulders. Vegetation is also mowed for habitat management in areas not grazed by cattle or horses, and for aesthetic purposes in planted turf areas and open spaces within the cantonment area. Mowing activities in grassland and vernal pool habitat is done to maintain vegetation height and thatch levels that are optimal for the federally-listed species. Mowing may occur as often as weekly in developed areas and around the flightline. In undeveloped areas, mowing occurs once or twice per year, depending on the time of year and the growth rate of vegetative material. This is accomplished with gasoline and diesel mowers (manual, ride-on, or commercial mowers), hedge trimmers, and weed whackers. Mowing in undeveloped areas generally commences in the spring once the soil is no longer saturated. Vegetation around the flightline is maintained between 7-14 inches, while vegetation around buildings and facilities, along roadways, and in landscaped areas is generally kept to ≤ 6 inches.

Grazing and Livestock Management

Travis AFB has determined that grazing activities will benefit federally-listed species and their habitats. The duration, intensity, and frequency of current and future seasonal grazing on Travis AFB is designed to improve habitat for federally-listed species occurring on the Base; promote native species; minimize soil erosion; reduce non-native plant species; reduce wildfire risk; and prevent the spread of undesirable plant species (Travis AFB 2016b). See the *Conservation Measures*

section below for general measures, and Tabs A-F for species-specific conservation measures that will be implemented during grazing to avoid potential effects to federally-listed species:

To prevent non-native plant species from becoming increasingly dominant in upland grassland areas, and in vernal pools, management in the form of grazing is necessary (Travis AFB 2017b). While grazing alone does not eradicate invasive species; it is effective in reducing infestation and slowing the spread of some undesirable species. Grazing is one of the most compatible long-term management tools for grassland habitat on the Base, because nearby infrastructure makes burning less practical and risks injury and damage to human health and property.

Travis AFB accommodates agricultural out-leasing as a major land use. Grazing currently occurs within designated fields, or Grazing Management Units (GMUs), located along the southwestern portion of the Base (see Figure 7 of the Enclosure). Both cattle and horse grazing occur within these areas from November - July for cattle and year round for horses. Table 7 of the programmatic biological assessment provides information on the current size of each GMU, its capacity for grazing (measured in animal unit months), and the type of livestock that it supports. Cattle grazing currently occurs on 425 acres and 75 acres are grazed by horses (Travis AFB 6a).

In addition to the pastures currently being grazed on Travis AFB, the Base proposes to graze up to an additional 595 acres of land in areas that are either unmanaged or mowed, and where habitat degradation has been observed. All lands currently being grazed and lands proposed to be grazed are located on the west side of the Base, extending from the southwestern boundary to the boundary of the former Aero Club in one continuous parcel. Most of these areas do not have infrastructure currently to support livestock grazing, so improvements to fencing and development of water sources as described in the programmatic biological assessment will be required (See the *Description of the Proposed ction* section in the following programmatic biological opinion for proposed fence installation). Existing access roads within grazing units are maintained and the Base will not install new access roads within the grazing units. See section 4.4.3 of the programmatic biological assessment for a description of how grazing units will be developed and maintained for grazing purposes.

Aero Club Grazing Study

At the Aero Club Preserve, fencing and grazing infrastructure improvements were initiated in 7, as part of another project, in order to facilitate livestock grazing within a 106-acre pasture. The grazing program at the Aero Club will be implemented as a management tool to enhance habitat for vernal pool species by controlling non-native species. Generally, livestock grazing at the Aero Club will occur from about October - July. The duration, intensity, and frequency of seasonal grazing will be managed to benefit federally-listed species; improve native habitat; sustain native vegetative cover; minimize soil erosion; and prevent the spread of invasive plants. Travis AFB will adopt sampling and monitoring methods for -7 years, which will allow for adaptive management by informing decisions about each year's grazing duration and intensity to maximize habitat improvements for federally-listed species. For further details, see the *ero Club Grazing Study* proposed in section 4.4.3 of the programmatic biological assessment, pages 52-53. Site-specific management and monitoring plans are included in Travis AFB's Grazing Management Plan (Travis AFB 6a).

Travis AFB will implement the following additional Avoidance and Minimization Measures for Livestock Grazing Practices, identified in their response letter dated, July , 2017, and in *Travis AFB's Grazing Management Plan, Revised February 2017:*

- Grazing compliance surveys will be conducted monthly to verify grazing lease and grazing

land use regulations (Travis AFB 2017c) are properly implemented;

- Minimum residual dry matter (RDM) level range of 500-900 pounds per acre by October of every year, through stocking rate manipulations and grazing season adjustments (shorter or longer seasons);
- Reduce invasive plant species over the next 5 years;
- Monitor and collect fall RDM data, followed by an annual meeting with the cattle lessee and equestrian center to review, discuss, and analyze results of past grazing practices for adaptive management; and
- Monitor and collect 2018 baseline vegetation composition data to inform management prescriptions for weed control.

Categorical Activities that ay Affect but are ot Likely to Adversely Affect Federally-Listed Species and their Habitat

The following section describes activities that are not likely to adversely affect these species or their habitat. Also, see Level 2 activities in Tables 1 and 2 ("not likely" activities), and Table 6, for a list of "not likely" activity categories.

Travis AFB has determined, with the incorporation of the appropriate avoidance and minimization measures, the following activities are **not likely to adversely affect the California tiger salamander or its habitat:** projects having temporary disturbance of upland habitat in yellow risk CTS areas; and/or work limited to paved/gravel surfaces and shoulders in red risk CTS areas (Table 1-Level 2, with the appropriate conservation measures). Project effects located in upland habitat, having a disturbance of ≤ 4 acre in yellow risk CTS areas, will be summarized and retained by the Base, and will be submitted in an annual report to the Service. Although no habitat compensation will be required for projects that fit these criteria; appropriate general minimization measures (*Conservation Measures* section), and species-specific avoidance measures (Tab D of the Enclosure) will be implemented to avoid potential adverse effects to California tiger salamander and its habitat.

In addition, Travis AFB has determined, with the incorporation of the appropriate avoidance and minimization measures, the following activities are **not likely to adversely affect the vernal pool fairy shrimp, vernal pool tadpole shrimp, Conservancy fairy shrimp, Contra Costa goldfields, and the delta green ground beetle, or their habitat**: projects occurring outside wetlands, but within 250 feet of wetlands that meet any of the following criteria; the wetland is located higher in elevation than the work site; the wetland area is upstream of the project; a physical barrier to hydrological connectivity is present; shallow excavation; or other valid reasons why wetlands will not be affected (see Table 2-Level 2 activities).

Invasive Plant Species Management

The Travis AFB Invasive Species Management Plan (Travis AFB 2017b) was developed to address invasive species control which describes activities that are completed for the sole purpose of providing a conservation benefit to federally-listed species and their habitat. This plan identifies 1 invasive plant species that are of particular concern on Travis AFB that are known to occur in plant communities on the Base. Section 4.4.2 of the programmatic biological assessment lists the invasive plant species of particular concern at Travis AFB, and also lists weed species known to be prevalent in the region.

Prescribed Burns

Prescribed burn actions as proposed by Travis AFB, in general, are not likely to adversely affect federally-listed species and their habitat (requiring Level 2 consultation). Travis AFB anticipates prescribed fire will result in overall benefits to federally-listed species and their habitat. However on

a project by project basis, prescribed burns may require Level 3 consultation for potential adverse effects to the California tiger salamander, depending on which prescribed fire practices are employed. See the *Prescribed Burns* section under the *Proposed Action*, and potential adverse effects to the California tiger salamander described under the *Effects of the Action* section in the following programmatic biological opinion. urthermore, in order to avoid potential adverse effects to Contra Costa goldfields, prescribed fires will not occur in occupied habitat when the vegetation is green (April June), and will be scheduled after the federally-listed plant has senesced and seed dispersal is complete.

Burning of dry vernal pool habitat is expected to have a beneficial effect to vernal pool habitat by reducing viable seeds of non-native annual grasses still holding seeds; removing thatch; changing vegetation composition over the following one to three growing seasons, and benefiting native forbs within vernal pools (Marty 2015). Prescribed burning reduces competition from annual grasslands and broad-leaf weeds such as yellow-star thistle, which will be targeted by prescribed fires. Marty (2015) found that native plant cover and diversity were higher in burned vernal pools than unburned vernal pools and nonnative annual grass cover was significantly lower than in unburned plots for at least 3 years after treatment at the Jepson Prairie Preserve. They also monitored fire behavior in the vernal pools in this study and found that most fires did not carry into the vernal pool basin (Marty personal communication 2017).

Herbicide Treatment

Travis AFB anticipates that most herbicide application will have an overall benefit to federally-listed species and their habitat, due to complete avoidance and implementation of species-specific conservation measures. However, there may be some instances where full avoidance of federally-listed species and their habitat is not feasible, and potential insignificant or discountable affects may occur. Full avoidance will be achieved by designating 250 foot no access buffers around suitable species habitat. Mechanical methods will be used for the removal of invasive plant species within 20 feet of the mapped wetlands. Herbicide treatment will not be applied within 20 feet from the edge of mapped wetlands. See additional avoidance and minimization measures under the *Conservation Measures* section. Potential insignificant or discountable affects to federally-listed species and their habitat may occur if invasive plants are targeted within, or in close proximity, to these species and their habitat.

The *Invasive Species anagement lan Treatment Options for Travis AFB Weed Species* developed for Travis AFB identifies targeted weeds and outlines control strategies for these species (Travis AFB 2017b). Specifically, Appendix B of the plan (pages B-12 to B-29), includes recommendations regarding the best timing and herbicide formulation for each weed species that will be followed if herbicide application occurs. Although, it is not known at this time which chemicals will be used; Travis AFB proposes to use any of the herbicides recommended for use in their referenced *2017 Invasive Species anagement lan*. Decisions on specific nontoxic surfactants and specific herbicides to be used will be made by personnel licensed/certified by the State of California in coordination with the Base's Natural Resource Management Team, and only those certified shall apply herbicides. Herbicides will be applied per their label and follow the additional minimization measures developed, as noted in an excerpt provided by Travis AFB from the Solano RCD's *Final Weed Report 2015-2016*.

Grassland Restoration

Habitat restoration treatments such as replanting or reseeding may be used in Travis AFB grasslands to promote native species and restore natural and habitat conditions. Reseeding or replanting using native species may occur if the Base determines that restoration treatments are required due to

invasion by problematic weed species or significant degradation of habitat value. The most common planting methods which may be used at Travis AFB are drill seeding and plug planting. See section 4.4.6 of the programmatic biological assessment for a list of native plant species that may be used and a description of these planting methods.

Hand pulling of non-native plants before restoration occurs may also be completed prior to restoration; although, manual removal methods are labor intensive and costly for large infestations and may not be feasible. Hand-pulling of seedlings has shown to be very effective at inhibiting new growth of some invasive species; however, a shovel or Pulaski will be used for removing well-established clumps of larger plants. Manual removal of invasive plants may be the most desirable weed control method for projects located in suitable habitat for federally-listed species.

The Service concurs with Travis AFB's determination that the projects and activities described in the section above (i.e., *Categorical Activities that ay Affect but re Not Likely to Adversely Affect the pecies*, and summarized in Tables 1, 2 (Level 2), and 6 may affect, but are not likely to adversely affect the California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, Conservancy fairy shrimp, Contra Costa goldfields, and the delta green ground beetle, or their habitat. If during the 5-year term of this programmatic action new information reveals effects of the proposed action may affect federally-listed species or their habitat in a manner or to an extent not previously considered Travis AFB will contact the Service to determine whether these determinations are still valid.

The remainder of this document provides our biological opinion on the effects of the proposed projects on the California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, Contra Costa goldfields, and their designated critical habitat.

BIOLOGICAL INION

This programmatic biological opinion provides the framework for species habitat compensation, conservation measures, species salvage and relocation efforts, avoidance and minimization measures.

Description of the Proposed Action

The following proposed action consists of typical activities performed by Travis AFB which are likely to require section 7 consultation requirements at Travis AFB Base and the GSUs managed by the Base. General conservation measures described below under *Conservation easures* will be implemented for all applicable proposed projects described in this programmatic biological opinion. In addition, species-specific conservation measures are included in Tabs A, B, D and E of the programmatic biological assessment, and will be implemented for all applicable proposed projects. Project specific conservation measures will be selected from these lists of measures during the project analysis phase conducted by the Base, and following the consultation template provided in the Enclosure. Table 1-Level 3, and Table 6 provide a list of the proposed projects and activities which have the potential to adversely affect vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander and Contra Costa goldfields, or their habitat. If both direct and indirect effects have been identified, only the higher level of effect is noted in this table.

The Air Force conducts numerous mission-related activities and operations on Travis AFB. For the purposes of this consultation only, the actions proposed by the Air Force consist of four core programs (Mission Operations, Infrastructure Support, Infrastructure Development, and Environmental Management), which occur throughout the Base and associated GSUs, and are likely

to adversely affect vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, and Contra Costa goldfields, or their habitat. The following paragraphs consist of a brief description of the four programs and describe categories of flight- related, construction, and maintenance activities that will occur in accordance to these core programs:

Mission Operations

Airfield and Flight Operations

Travis AFB hosts the 60th and 349th Air Mobility Wings (AMW). The 60th AMW is the largest air mobility organization within the Air Force (in terms of personnel), and supports maintaining and flying the C-5 Galaxy cargo aircraft, the KC-10 Extender refueling aircraft, and the C-17 Globemaster III cargo aircraft. In partnership with the 60th AMW, the 349th AMW, the largest reserve wing, also makes its home at Travis AFB with its four flying squadrons, three Aerial Port Squadrons, and three Aircraft Maintenance Squadrons.

The 60th AMW is responsible for strategic airlift and air refueling missions circling the globe. The unit's primary roles are to provide rapid, reliable airlift of American fighting forces anywhere on earth in support of national objectives, and to extend the reach of American and allied air power through mid-air refueling. The 60th AMW maintains a work force of approximately 5,800 active-duty military and more than 1,000 appropriated fund civilians and more than 400 non-appropriated fund civilians to support its global mission. In addition, more than 3,500 Reservists are assigned to the associated 349th AMW; combined with their active duty and civilian counterparts form a fully integrated Total Force team.

Travis AFB maintains two main runways; Runway 3R/21L and 3L/21R, which are both oriented northeast/southwest. Both runways are protected by a 2,000-foot wide primary surface in which development is prohibited. The primary surface of the two runways consumes about 1,036 acres of land. A new runway facility, the Assault Landing Zone (ALZ), was recently constructed parallel to 3R/21L on 58 acres. Other facilities supporting flight operations include associated taxiways, cargo ramps, hangars, and associated maintenance facilities.

Travis AFB supports about 42,000 annual total aircraft operations of which 41 percent occur at night, between 10:00 p.m. and 7:00 a.m. Many operations at Travis AFB are conducted by the military aircraft based at the installation, but a large number also include many transient military aircraft and contract commercial aircraft. Flight frequency is variable and future operation rates are subject to change based on mission need. As part of flight operations and other non-mission related flight activities including air shows, the Air Force may alter or expand existing facilities. In most cases, these activities will occur within previously disturbed or developed areas. To reactivate, operate, and maintain existing facilities at Travis AFB, the Air Force may demolish and/or remove existing equipment, fences, antenna towers, and power poles; install structures above and below ground such as subsurface communication lines and utilities, concrete pads for mounting equipment, new power poles and power lines, firebreaks, diesel-powered generators, security barriers, fences and lighting; and repave access roads.

Limited expansion of existing airfield operations and maintenance facilities is projected under the Air Force's Installation Development Plan, including a new War Reserve Material storage facility, Aerial Port facility renovation and new fencing around the airfield development area. About 783,285 square feet (ft^2) of facilities are scheduled for demolition within the developed area north of the flightline.

Security and Antiterrorism Operations

Security and antiterrorism operations primarily include law enforcement patrols and boundary evaluation. These operations include using vehicles to conduct the patrols, which typically traverse the Base via existing roads and trails; installing high-powered lights; and removing vegetation via mechanical removal (e.g. mowing, weed eating), or herbicide treatment to improve visibility at secure facilities, gates, and similar locations. Fence maintenance and repair is another crucial component of security and antiterrorism operations.

Other Military Training

Travis AFB military personnel may conduct field operations training for personnel on a routine basis. Training may consist of erecting temporary shelters (e.g., tents), staging of equipment and vehicles, and locating generators near the temporary training sites. Some of these activities will occur in upland areas.

Infrastructure Support

The general types of operations and maintenance projects that routinely occur on Travis AFB include: repair and maintenance of paved and unpaved roads and parking lots; maintenance and demolition of structures and buildings; maintenance, inspection, repair, and replacement of drinking water, wastewater, storm water, natural gas, and other compressed gas pipelines; fuel systems; installation of under- and above-ground utilities such as fiber-optic cables, conduits, power lines, and sensors and poles; landscaping and mowing; and maintenance and replacement of fences and signs.

Road and Bridge Construction and Maintenance

Road Maintenance

The Air Force maintains more than 76 miles of arterial roadways and 118 miles of secondary roadways that vary from one to four lanes in width. The average life span for most roads is anticipated to be 20 years before complete replacement. Travis AFB's 60 AMW Civil Engineer Squadron maintains roads annually after the rainy season. Repair activities may range from filling potholes to replacing road segments. Under most circumstances, replacement will require removal, grading, curb repair, placing new foundation and pavement, placing culverts, testing, sealing, painting, and installation of reflectors or other warning devices. Unpaved roads are used by security, operations, maintenance, and other personnel at all times of the year.

The Air Force performs unpaved road maintenance activities to make the roads usable by standard and four-wheel drive vehicles. These actions include, but are not limited to, installing and grading gravel material or shale to improve road stability and decrease washouts and weathering, installing drainage culverts where needed, filling holes, and repairing any areas where erosion has impacted the road. Recreational pathways for non-motorized vehicles and pedestrians occur throughout the Base in recreational areas as well as throughout Base housing. These paths are primarily comprised of decomposed granite or asphalt and are typically 4 to 6 feet wide. These paths are maintained during the dry season as needed to ensure they are safe for use. Maintenance activities include repairing and filling cracks on paved paths, smoothing and redistributing trail surface material for unpaved paths, and mowing as necessary.

Road paving and repair will generally disturb up to 5 feet from the paved road surface, which allows for equipment to access the area. The existing surface will be leveled and then base rock will be laid down up to 6 inches thick and then covered by up to 6 inches of asphalt or concrete. For gravel roads, the surface will be leveled and to 4 inches of gravel will be laid down. The depth of

disturbance will e no more than 8 inches for paved roads and 12 inches for gravel roads. The heavy equipment used for construction may include scrapers, loaders, grinders, pavers, or rollers.

Bridge Construction and Maintenance
New bridges will e constructed throughout Travis AFB as needed. Materials such as rock, concrete, and sand will e used to upgrade the physical structure so that the bridges can support vehicles. Bridge construction may also include removal/excavation of sediments and bottom material. Bridge construction will typically involve the use of heavy equipment such as excavators, scrapers, loaders, dozers, backhoe, cranes, and dump trucks.

Existing bridges throughout Travis AFB will e repaired, maintained, or upgraded to existing safety standards as needed. Routine repair activities include the repair of footings to prevent future erosion, the installation of railings and support beams for structural support, the sealing of cracks, and the filling of potholes in roadways. Materials such as rock, concrete, and sand will e used to upgrade the physical structure so that the bridges can support vehicles. Bridge repairs may also include removal/excavation of sediments and bottom material and the use of an excavator and a dump truck.

Runway, Aircraft Ramps and Taxiway Repair and Maintenance
The existing concrete aircraft runways, parking ramps and taxiways on Travis AFB may become deteriorated over time to the point where there is an increased risk of foreign object damage to aircraft. As these areas are identified, Travis AFB will replace the existing concrete runway, taxiways and parking ramp and repave the asphalt shoulders as needed. The work typically consists of the removal of existing concrete and granular base, and placement of the new concrete layer. The concrete layer is placed over a drainage layer, which is placed over aggregate base layers and a lime-modified subgrade layer. The asphalt shoulders are then repaved with hot mix asphalt. Lastly, joint sealing and paint striping is completed. The cementitious material, aggregates, water and admixtures are placed in transit agitator trucks or mixer trucks and transported from a temporary concrete batch plant to the project site and unloaded into a paver machine. It is anticipated that between two to four cubic yard mixer trucks will e needed for these types of activities (depending on contractor production rates).

Joint and Crack Sealing
Travis AFB runways, taxiways and ramps require routine maintenance and include repair and sealing of pavement joints and cracks. Joint and crack repair includes the removal of the existing joint, sandblasting or other means of cleaning the joint or crack and then resealing the joint with an appropriate sealant. The equipment used for this operation typically includes a 200-gallon capacity heated asphalt joint seal machine or equivalent.

Runway Rubber Removal
Twice per year, Travis AFB is required to remove the rubber that accumulates on the active runway surfaces. Rubber deposits are removed using specialized rubber removal equipment that uses high pressure water without additional chemicals. The water is recirculated within the equipment and all waste water and rubber debris is contained for proper disposal off- Base. During this activity, all equipment remains on paved surfaces at all times. Following rubber removal, the runway surface is typically restriped and any cracks are sealed.

Facility Maintenance and Demolition

Maintenance and Upgrade
Facilities will be repaired, upgraded, and maintained throughout Travis AFB. Most work will be located in the developed areas of the main Base, the flightline and housing areas. Facility repair or upgrades will generally occur in areas that are previously developed. Activities may include maintenance and upgrades to existing facilities, munitions storage structures, parking lots, storage sheds, concrete pads for utility boxes, sidewalks and communications structures. Each project will have a ground disturbance footprint of up to 1 acre. These activities may involve the use of heavy equipment including excavators, bulldozers, dump trucks, pavers, and scrapers.

Air Force recreational facilities such as running tracks and soccer and softball fields may require periodic maintenance to ensure the surfaces are safe for use and may include filling holes, replacing turf and minor ground leveling. The munitions bunkers on the Base have soil roofs that require periodic repair and/or replacement, in part due to ground squirrel activity. To replace the soil roofs, Travis AFB will remove the existing turf covering on a bunker (roughly 2,500 ft^2 each) and fill with soil at a minimum of 2 feet in thickness. The new soil roofs will consist of a smooth slope down to the base of each bunker and will be treated with lime. Grass will then be reestablished to stabilize the earthen cover. Repair of these structures may include filling cracks and holes in the earthen surfaces. Other repairs may include trenching through upland habitat to repair electrical system deficiencies and the placement of concrete pads for installation of associated service equipment.

Demolition
Travis AFB will remove degraded, unsafe, and/or unnecessary facilities. Removal of the facilities is necessary to minimize safety concerns, reduce maintenance costs, and/or provide land for new construction. Demolition activities will typically occur in the developed areas of the main Base, such as the flightline and housing areas. These activities may involve ground disturbance of up to 3 feet in depth, and may include removal of: existing facility structures; associated equipment and utilities; facility parking lots; and fencing. Activities may require use of heavy equipment including excavators, bulldozers and dump trucks.

Utility Installation, Maintenance, and Removal
Aboveground Utility Lines
Existing utilities will be replaced and maintained throughout the Base in support of Air Force's missions. Additionally as Travis AFB implements new missions, the installation of new utilities will likely be required. Most of the existing utilities are located in the developed areas of Travis AFB. Occasionally, there will be utilities installed in the undeveloped areas when expanding existing lines is needed. Utility poles on the Base are generally placed 180 to 250 feet apart. This generally allows for avoidance of wetlands during the installation and replacing of poles. Guy wires for pole stability are sometimes required, which are installed surrounding the pole using tie downs secured in concrete blocks (<5 ft^2).

Utilities will generally be installed within 25 feet of existing roads; however, some traverse open grassland areas. Pole installation will involve disturbance of a 100-foot diameter area. This will allow for heavy equipment to conduct the installation by digging down 6-10 feet to install the pole. A 24-inch truck mounted auger is typically used to excavate down to 6-10 feet and install the pole. A similar process is used to install guy wires (anchors) and guy poles. Typical equipment includes: pole trailers; line (bucket) trucks; and digger (pole) trucks.

Annual inspection will require access to utility poles, transformers and electrical equipment in undeveloped areas on Travis AFB. Typical equipment used to access these areas will involve disturbances of a 50-foot diameter area around the equipment. Access for typical annual equipment inspections is limited to the dry season, barring emergencies when life and death situations are presented due to electrical system malfunctions.

Underground Utility Lines
New and existing utilities including in-ground electrical; communication cables; pipes for below ground water; fuel; and sewer lines will be installed and maintained throughout the Base to support new workload, missions or an increased capacity of existing workloads. Most of the existing utilities are located in the developed areas of Travis AFB. Occasionally, there will be utilities installed in the undeveloped areas when expanding existing lines is needed. Utilities will generally be installed within 25 feet of existing roads, however some traverse open grassland areas. Trenching varies for different utilities. For electrical, the trench will be between 2-5 feet wide and 3-6 feet deep. The trench for cable and pipe placement will be between 2-5 inches wide and 3-4 feet deep. When installation of utilities involves directional drilling underground, a 6 x 6 x 6 foot entrance and exit pit is required for drill head access and removal. A trencher or backhoe will be used for these tasks. Soil will be backfilled into all trenches.

Underground electrical utility projects frequently include the installation, removal, or maintenance of pad-mounted electrical transformers that provide electrical service to structures on the Base. The concrete/fiberglass pads typically range from 3' x 3' x 6" to 10' x 12' x 12" (width x length x depth), and are typically located in close proximity to the structure they feed. Some electrical infrastructure/designs necessitate pad-mount transformer locations be located in upland grassland areas. Other typical electrical infrastructure include: pullboxes; junction boxes; switches; handholes; manholes; circuit breakers; etc.; all of which vary in size and require different installation methods. Occasionally, underground electrical lines experience faults, requiring access for immediate repairs. These repairs will require a minimum 4 x 4 x 4 foot entrance pit to perform repairs. More significant excavation may be required depending on the severity of the damage. All disturbed areas will be restored to its preconstruction state upon completion of the repairs.

Electrical manholes are occasionally dewatered in order to prevent underground electrical infrastructure damages, and to ensure safe working environments. Utility vault pumps will be constructed in accordance with the National Pollutant Discharge Elimination System Utility Vault Discharge Permit conditions. Depending on the time of year and location of the vault, discharges vary between a couple hundred gallons, to thousands of gallons.

Culverts and Drainage Ditches
New culverts will be installed at drainage crossings and high surface water flow areas throughout Travis AFB. Existing culverts and drainage ditches are mostly located in the developed areas of Travis AFB. Occasionally, there will be new culvert and drainage ditches constructed in the undeveloped areas when necessary. This will ensure surface water is adequately captured and contained to reduce potential flooding on the Base. Existing culverts will be upgraded or repaired at drainage crossings. This work will involve replacing existing culverts with larger ones, and may require minimal widening or deepening of current drainages. Soil , sediment, and vegetation will be excavated during culvert installations, which require an excavator, back hoe, and dump truck. New culverts and culvert repairs may also include constructing new concrete support structures at road culverts.

Landscape Maintenance

Landscape maintenance activities include planting, trimming and mowing, and the removal of turf, shrubs, and flowerbeds. Landscaped areas occur predominantly in the main cantonment and housing areas, at high visibility facilities, and in the vicinity of the airfield and flightline. The Air Force may remove existing vegetation and landscape areas associated with the construction of new facilities in areas not previously landscaped.

Fencing Installation, Maintenance, and Replacement

To enhance security and protect assets and resources, fences are erected throughout Travis AFB around buildings, facilities, and areas containing natural resources. Fences may also be used to contain livestock, prevent pedestrian access in natural areas, and to demarcate various areas. Currently, there are about 100 miles of existing fence, and the type (chain link, barbed wire, electric) and height of these fences vary based on its purpose. Fence installation, maintenance and replacement typically involves clearing brush, digging holes mechanically or by hand, and installing new poles and fencing. Maintenance schedules are highly variable and depend on the condition of the fence and the asset it is protecting.

Travis AFB repairs or replaces 5,000 to 10,000 feet of fencing each year. In addition, due to changing security requirements, the Base may install about miles of new chain link fence over the next years. Installation of fencing will require a 15-foot area to be mowed clear of all vegetation and area leveled. Equipment such as a tractor and truck with an auger that will access the area in the 15-foot work zone may be required. A 3-foot deep hole will be dug to install the support poles that are foot in diameter. Support poles will be installed every feet. If necessary to avoid wetlands, the poles can be extended out to 15 feet and concreted in. The chain-link fence will be constructed to a height of 7-8 feet with three strands of barbed wire placed on outriggers.

Infrastructure Development

Develo ment Pattern

The existing development pattern provides a basic guidance for the future development of land resources and attempts to integrate future requirements with decisions made over the last 50 years. The development pattern attempts to balance the need to maintain a maximum capability for: the Base's mission; locating new facilities in economical and convenient locations; and for the conservation of federally-listed species and their habitat. Because flight operations are the primary mission of the Air Force at Travis AFB, the land use is a high priority in regards to future facility planning.

Future Development

Land use at Travis AFB is not expected to change significantly; however, hardscape development such as the addition of new parking lots, roads compacted gravel, and other hardscape surfaces is planned to occur. Additionally, there are multiple opportunities to make better use of space and consolidate functions efficiently. This is particularly true of the north flightline, which is considered the prime real estate of the installation. Over time, uses that do not require adjacency to the airfield will be moved off the flightline. The other major consolidation of land uses is in the southwest. Industrial uses that are currently scattered across the installation will be co-located in the future, forming a super-industrial district. This will reduce compatibility issues with other uses, and also create space on the flightline and in other areas.

Administrative uses will expand but functions will be concentrated together more densely. The current patchwork of multiple land uses will be phased out over time to create a more cohesive, campus-like environment. Recreational uses, which are currently spread out across the Base, will be

consolidated into a recreation campus in the northwest corner of the installation, providing easy access to and from accompanied housing.

Space is projected for additional recreational facilities that serve the Base population, including the addition of new soccer fields, community park development and the expansion of other outdoor recreation land use growth areas. These are generally located adjacent to housing and the dormitories in the urbanized portion of the cantonment area. Expansion of these recreational areas will entail increasing their acreage and incorporating landscaping and recreational equipment for children and adults.

Minor Construction Projects
New facilities will be constructed throughout Travis AFB. Development of new industrial, commercial, and residential facilities may include airfields; munitions storage facilities; communication structures; concrete pads; parking lots; storage yards; and detention basins. Most of the new facility construction will occur in developed areas of the main Base, such as the flightline or housing areas. New construction will be generally limited to designated development areas; although, new construction may occasionally involve minimal disturbance to undeveloped areas. Projects occurring in developed areas may cause disturbances down to 6 feet. Projects requiring excavation to 6 feet will use heavy equipment including excavators, bulldozers, dump trucks, pavers, and scrapers.

Environmental Management Programs
Environmental Restoration Program (ERP)
The ERP is a congressionally authorized Department of Defense (DOD) program for the identification, investigation and remediation of past DOD waste releases (prior to January 1 1984). The ERP is designed to identify and correct problems arising from past releases of hazardous substances and petroleum products into the environment. Travis AFB is a National Priority List site; therefore, the Base is required to address ERP sites in a manner consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act, and the Resource Conservation and Recovery Act (RCRA). The Environmental Protection Agency (EPA) Region 9 is the lead regulatory agency for the investigation and cleanup of contaminated are as in coordination with the California Department of Toxic Substances Control (DTSC) and the California Regional Water Quality Control Board (RWQCB), San Francisco Bay Region.

Most of the installation's ERP sites have undergone clean-up actions and are closed, but 29 sites with land use controls (LUCs) remain. These sites are undergoing remediation and until closed will require special consideration to limit exposure to contaminants. Travis AFB has been involved in environmental cleanup for over 30 years. Currently, Travis has 10 contaminated soil sites with LUCs and 19 contaminated soil and/or groundwater sites also under LUCs. At each remaining restoration site, Travis AFB restricts the land use to industrial purposes only; prohibits on-Base water supply well construction and consumption of contaminated groundwater; and places constraints on soil excavation and other subsurface work where a worker might encounter contaminated groundwater or vapors. The 19 contaminated groundwater locations are primarily located near the flightline. Major soil clean-up actions were completed in 2003 and 2007. Efforts to clean up remaining sites are ongoing.

Site Investigations and Remediation Methods
A substantial amount of investigation has been completed to characterize the nature and extent of contamination and the potential response actions for each location. A typical methodology to

determine the type and extent of contamination at a site is the collection of soil samples from varying depths, depending on the specific site and the known historical contaminants present at the site. While some borings may be as shallow as 1 to 2 feet, some may exceed 50 feet. Soil samples may be collected with hand equipment (i.e., hand auger) or mechanical tools (i.e. air knifing, drill rigs with augers or direct push technology). Soil borings are generally made in areas surrounding the contaminated site to determine the extent of contamination. If groundwater contamination is being investigated, groundwater samples may be collected using a direct-push technology rig or a hollow-stem auger drill rig. Investigation groundwater samples are generally collected from depths of 15-40 feet. Drilling activities generally generate soil cuttings that are stored in soil bins or 55-gallon drums that placed in close proximity to where drilling activities occur.

While most of the ERP sites on Travis AFB have been cleaned up and closed, some sites may require further action. Remediation activities can include well installation (extraction, injection, and monitoring wells); redevelopment of existing wells; decommissioning of wells once they are no longer needed; soil excavation and backfill; hauling; soil capping; phytoremediation plantings; chemical or biological amendment injection to groundwater; single or multiphase extraction and aboveground treatment; in-ground permeable reactive barrier or barrier wall; air sparging; and thermal treatment. Most of these technologies require installation of access to monitoring wells for periodic monitoring of the treatment system. The nature and area of disturbance associated with each of these activities can vary greatly as indicated below:

- Well Installation involves utility clearance, drilling, construction of the well and surface completion, well development, and surveying of the well. Disturbances range from 10 ft^2 to less than 1 acre.
- Well Redevelopment of existing wells to optimize the performance of the wells. Disturbances range from 10 ft^2 to less than 1 acre.
  Well Decommissioning involves either pressure grouting or over drilling and grouting of the well. Disturbances range from 10 ft^2 to less than 1 acre.
  Soil Excavation involves removal of contaminated soil. Disturbances range from 10 ft^2 to several acres.
- Soil Capping involves covering contaminated soil with either a few feet of soil or a layer of concrete/asphalt to prevent contact with the contaminated material. This technique is often applied to former landfills, such as the former Landfill 2 on Travis AFB, where 94 acres were capped with 5 feet of clean soil. Disturbances range from 10 ft^2 to less than 1 acre.
  Phytoremediation involves the planting of trees in order to extract shallow contaminated groundwater. They also absorb contaminants and thereby cleanse the aquifer. The level of these effects will depend on the water uptake capacity of the plants and the size of the aquifer. Disturbances range from 0.25 to 2 acres.
- Chemical or Biological Amendment Injection involves injection of compounds into the subsurface either through the use of a direct-push rig or an injection well network. The injection array can be installed to concentrate on a source area or as a flow-through barrier with spacing ranging from 5 to 20-foot centers. Disturbances range from 100 ft^2 to 2 acres.
- Permeable Reactive Barrier Installation involves the installation of a narrow barrier generally 2-5 feet wide extending into groundwater containing a material that enhances treatment. The reactive material varies and may include, but is not limited to, iron filings, bark mulch, oxygen, emulsified vegetable oil, or ozone injection. Permeable Reactive Barrier remediation can also involve driving sheet piling into the surface or using direct-push rigs to create a grout curtain to direct the flow of groundwater though a localized barrier. Disturbances range from 100 to 3,000 feet.

- Multiphase Extraction or Sparging with Aboveground Treatment involves trenching and the installation of piping to connect 1 to 50 or so wells to an aboveground treatment system that consists of a concrete pad with the necessary treatment equipment. The area for trenching will range from 10 to 3,000 feet per trench. The treatment pad can range from 100-2,500 ft^2.
- Thermal Treatment involves installation of subsurface heating elements and thermal couples on 10 to 20-foot centers over the extent of the treatment zone. It includes installation of a multiphase extraction system with associated aboveground treatment system described above. The area for trenching will range from 10 to 3,000 feet. The treatment pad will range from 500 to 2,500 ft^2. During this treatment, the ground is heated to volatilize contaminants therein and the volatilized compounds are then vacuumed off, captured and removed.

ERP Site Maintenance and Groundwater Monitoring

Most sites also require regular operation and maintenance activities. The groundwater restoration extraction wells, conveyance pipelines, underground electrical systems, and groundwater treatment plants at Travis AFB are operated and maintained on a continuous basis throughout each year. The purpose of this activity is to maximize the run-time of the systems in order to remediate contaminated groundwater beneath the Base as efficiently as possible.

Groundwater wells are sampled throughout each year to monitor contaminant plume mobility, degradation, and potential for new releases. There are currently 962 groundwater wells, 385 of which are typically sampled each year. In addition to sampling, 665 of the wells associated with Travis AFB are typically monitored for depth-to-water at least annually to assess water table fluctuations and hydraulic gradients. Well sampling and water level measurements are generally conducted two times per year (in April/May and in October/November). However, sampling may be conducted on a smaller scale throughout the year. Additionally, surface water samples are typically collected in April/May from five locations along Union Creek, where the creek intersects groundwater plumes. The surface water sampling data is used to evaluate whether groundwater discharging to the creek is adversely affecting surface water quality.

Invasive lant nd Pest Management (Fauna)

The U.S. Department of Agriculture conducts the non-lethal removal of raptors under a permit from the Service's Migratory Bird Permit Office in support of the Travis AFB BASH Program (Travis AFB 2008). Bullfrogs (*Rana catesbeiana*) and non-native fish may require removal from ponds on the Base. These species will be removed using seine nets, traps, and other commonly used devices. Alternately, ponds on Travis AFB may be pumped dry to eliminate populations of bullfrogs and fish in order to improve habitat conditions for the California tiger salamander.

Common pest wildlife on Travis AFB includes turkeys, skunks, opossums and raccoons. Pests are removed on an as needed basis. Physical removal and relocation of these animals is done with HAVAHART live traps. Additionally, Macabee traps and Wilco Gopher Getter are used to remove pocket gophers. Manicured lawns, parade grounds, golf course greens and fairways, and athletic fields are treated for gopher removal. Ground squirrels are found nesting along ditch banks and in open fields. Squirrel control is allowed using Wilco Ground Squirrel Bait in areas greater than 1.3 miles from known California tiger salamander breeding ponds (Travis AFB 2016b). If control is required in areas within 1.3 miles of a breeding pond, the Natural Resources Manager will be contacted to develop a plan that minimizes the risk to federally-listed species and their habitat. Rats and mice infest Base buildings and housing areas and are controlled without use of chemicals by employing practices; such as, closing entryways, practicing good sanitation procedures, and using snap traps and glue boards. Food handling establishments and commissary warehouses are the main

concern.

Herbicide Application

Herbicide treatment is one method that will be used to control some invasive plant infestations. All herbicides used on Travis AFB are in accordance with Natural Resource Conservation Service's best management practices. In addition, the DOD must approve herbicides used at Travis AFB. Glyphosate (e.g., Roundup Pro®, Glyfos® Pro, Glypro™ Plus) is a nonselective, systemic herbicide that carries plant toxins to the roots, and may be the most effective method for extensive infestations in disturbed areas with little desirable vegetation. Effective control can also be achieved by using a broadleaf herbicide that does not harm grasses.

Application of Telar XP to a dry wetland is consistent with the Telar XP label which states that application is permissible to intermittently flooded low lying sites, seasonably dry flood plains, and areas between upland and lowland sites (Dupont 2011). Pepperweed is a target weed for this herbicide along with many non-native grasses, mustards, starthistles, and clovers depending on the application rate (DuPont 2011). According to the Weed Science Society of America's Herbicide Handbook, Telar XP has an average field half-life of 40 days, and this decreases with lower soil pH. The Telar XP label lists the replant interval for several common pasture grasses, which provides an idea on how long the pre-emergent qualities can last for some plants. These range from 1 month after application at low herbicide rates (0.5 ounce/acre), and up to 4-6 months at higher rates (2 ounces/acre). One study had 95 percent weed control for 2 years at rates of 0.75-1 ounce/acre. The Solano Resource Control District (RCD) has a current recommendation of 1.5 ounce/acre; thus, different application rates will be experimented at Travis AFB to best control pepperweed and avoid or minimize adverse effects to federally-listed species.

Federally-Listed Species Habitat Management

Sensitive species management uses an ecosystem approach because some areas contain more than one species, and also support multiple Base-related activities. The intent of sensitive species management activities is to enhance habitat for federally-listed species or contribute to scientific understanding of their life history and habitat requirements. Species surveys may be conducted by either a biologists holding a section 10(a)(1)(A) of the ESA permit or a biologist with equivalent training and experience to better understand the distribution of federally-listed species at the Base. These surveys may include wet-season sampling in wetlands for vernal pool fairy shrimp, vernal pool tadpole shrimp, and California tiger salamanders; dry-season sampling in wetlands for vernal pool crustaceans; and drift-net studies for the salamander. Prior to conducting these studies, a detailed work plan and qualifications of the biologists conducting the work will be sent to the Service for approval.

These management actions may include removing invasive plant species in and around vernal pools and other seasonal wetlands; installing new and maintaining existing protective fencing in suitable species habitat; collecting native seeds for restoration; and conducting species surveys. Two perennial ponds occur in the Castle Terrace Preserve and have the potential to provide breeding habitat for the California tiger salamander (with management intervention); although, they currently have very low habitat suitability due to the presence of predaceous non-native fishes and bullfrogs. Eradication of fishes and reduction of bullfrogs may transform these ponds into suitable breeding habitat for the California tiger salamander. Eradication will require that these ponds be drained completely and allowed to refill naturally. Pond draining will occur after August and before the start of the next rainy season, to more closely mimic the hydrology of suitable California tiger salamander breeding habitat (which dries out in late spring and summer). Before draining occurs, as a conservation measure, screens will be placed over the drain pipe or hose in order to exclude

potential California tiger salamanders. The drained water will be pumped into an area where erosion will not occur, and in an upland area that will not trigger emergence/movement of the salamander. Pond draining will be repeated once every 3-4 years to effectively reduce the risk of bullfrog reintroduction.

California Tiger Salamander Burrow Inspection and Relocation

For some activities, it may be necessary for a qualified wildlife biologist to inspect suitable burrows with a scope and possibly hand-excavate burrows during pre-construction surveys, or at other times as deemed necessary by Travis AFB and the Service for protection of federally-listed species. If any California tiger salamander are found during these excavation activities or encountered at other times on the Base and require relocation, the *CTS Relocation Plan* as describe in section 4.4.5 of the programmatic biological assessment, pages 55-57 will be followed.

Vernal Pool and Seasonal Wetland Restoration

Habitat restoration may be conducted in vernal pools and seasonal wetland habitat in the event that impacts result from projects or unforeseen activities. The goal of these restoration activities will be to restore impacted habitat to as close to pre-disturbance conditions as possible. Unavoidable wetlands will be surveyed prior to proposed projects, in order to characterize the preconstruction conditions. Existing vegetation and hydrology will be characterized in order to document a preconstruction condition with which to compare post-construction characteristics. The preconstruction conditions will be one of the factors used to determine restoration success.

Prior to grading within wetlands, the top 4-6 inches of topsoil will be removed from the surface and stored separately from all other spoil piles, including non-wetland topsoil, in order to maintain integrity of the soil composition and character. Wetland topsoil will be replaced in the same wetland it was taken from following backfill and grading. Restoration of wetland areas will commence as soon as is practicable following construction. Generally, monitoring of wetland areas for the success of restorative efforts will occur at a minimum of 2 years. For further detail, see section 4.4.6 of the programmatic biological assessment.

Fire Management

Fire Suppression

Emergency fire department actions will be conducted Base-wide and allow personnel to respond to emergency fires without delay. This will allow quick containment of any unexpected threat to human health, safety or the environment. These actions may require the use of excavators, bulldozers, dump trucks, and fire trucks. Because of the nature of these actions they will most likely be consulted on after an emergency action has occurred. Any emergency action that occurred and potentially impacted federally-listed species requires verbal or email notification to the Service within 4 hours and a follow-up request to the Service to append the incident to this programmatic biological opinion as soon as all information is available.

Firebreak Maintenance

A system of strategic roads and fire and fuel breaks are located throughout Travis AFB for fire control and management. Currently, there are about 10.5 miles of maintained firebreaks. Firebreaks are used to prevent or hinder the spread of fire and are usually blocks or linear strips of land, managed to maintain very low or no fuel loading. The width of a firebreak is site specific and dependent on the fuel type, asset being protected and risk of potential wildfire. Prior to 2013, all firebreaks on Travis AFB were disked to reduce fuel loading. Since 2013, the mowing of these areas has been included in the grounds maintenance contract. Firebreaks are maintained by mowing all vegetation within a 20 to 30-foot wide strip.

Certain areas of the Base including the southeast boundary and the location of the Tactical Airborne Communications and Maritime Operations Project are considered high wildfire risk with potential to impact the flying mission (Figure 8). In these areas, a disked firebreak may be installed along the Base boundary, and maintained to reduce the fire risk. This firebreak will be 20-feet wide, no more than 12 inches deep, and approximately 1.0 mile long (about 2.5 acres). Additionally, a 25-foot area surrounding the DASR radar site will be maintained as a vegetation free zone by removing all vegetation and soil down to a depth of 3 inches. The cleared area will be leveled and geotextile fabric will be placed for weed prevention. A 3-inch layer of rock will be placed on top of the geotextile fabric. Additionally, fire hazards and safety concerns within the Explosive Ordinance Disposal (EOD) range will be eliminated by removing the soil that comprises the existing berms within the EOD range, and dispersing it in the adjacent upland area. Gravel will be placed on top of the dispersed soil to provide weed control over and area of about 2.5 acres. Gravel will also be placed on about 1,400 feet of unimproved roadways (10-15 feet wide) within the EOD range to improve road conditions and access (Figure 8).

As part of wildfire suppression and fuels management activities, the Base uses access roads that are single-lane secondary dirt roads (10 to 15 feet wide) to access remote portions of the Base. These roads are used to break-up contiguous fuel loads and provide a line of defense to execute fire-fighting actions. These roads are maintained once a year, after the rainy-season. For certain fuel-reduction projects, mastication may be used. The result of the mastication is about a 6-inch mulch layer left in place on top of the soil. This mulch is left in place to limit the amount of invasive weeds that establish within the area and to assist in erosion control.

Prescribed Burns

On a project by project basis, prescribed burns may require Level 2 or Level 3 consultation for potential adverse effects to federally-listed species, depending on which prescribed fire practices are employed. Potential adverse impacts may occur from the installation of roads or fire breaks for protection of resources, or to define fire boundaries; although, Travis AFB anticipates prescribed fire to result in overall benefits to federally-listed species and their habitat.

Prescribed burns include the planned, controlled application of fire to vegetation to achieve a specific natural resource management objective on land areas selected in advance of that application. Prescribed fires conducted on Travis AFB will be ignited by qualified personnel in accordance with an approved site-specific burn plan as described in the *Travis AFB Wildland Fire Management Plan* (Travis AFB 2015). Prescribed burning operations will utilize existing manmade and natural fuel breaks as much as possible. Fuel breaks will be mowed in support of prescribed fire operations, and will not be disked or graded. Prescribed fire has not yet been conducted on Travis AFB, but may be considered.

Implementation of prescribed burns may occur within 23 proposed burn plots, covering about 985 acres of land along the perimeter of the installation (Figure 8). Prescribed burns may occur during the spring and early summer (April, May, June, and July). Typically, up to 40 acres will be burned at one time on the Base; large burn plots will be split into smaller sub-plots for safety and cost reasons. A typical prescribed fire in annual grasslands consumes 75 to 100 percent of fine fuels; therefore, reducing fire risk for at least one season post-burn; each plot may be burned up to once per year to reduce fine fuel loads for the upcoming fire season in summer and fall. Prescribed burning is one tool out of several vegetation management options and use of prescribed burning will not be maximized, but rather used only when it best meets ecological objectives for a particular area and time.

Conservation Measures

General Avoidance and Minimization Measures:

Travis AFB proposes to implement the following general avoidance and measures in order to avoid and/or minimize potential adverse effects to federally-listed species and their habitats over the next 5 years. *Species-Specific Conservation Measures* will also be implemented to avoid and/or minimize potential adverse impacts effects to the following federally-listed species, and are included in Tabs A, B, D and E of the programmatic biological assessment (Tab A - *Vernal Pool Fairy Shrimp*; Tab B - *Vernal Pool Tadpole Shrimp*; Tab D - *California Tiger Salamander*; and Tab E - *ontra Costa Goldfields.*

Monitoring and Surveying

-1. A Service-approved biologist will conduct preconstruction surveys of all ground disturbance areas within sensitive habitats to determine if any federally-listed species may be present prior to the start of construction. These surveys will be conducted prior to the start of construction activities in and around any sensitive habitat. If any federally-listed species are found during the preconstruction surveys, the Service-approved biologist will contact the Service to determine how to proceed. At least 10 business days prior to the onset of activities, Travis AFB will submit the name(s) and credentials of biologists who will conduct these preconstruction surveys if they have not previously received Service approval for similar surveys. See the *Biological Monitor Qualifications* section 1.4.3 of the programmatic biological assessment for the minimum experience and qualifications required to serve as a Service-approved biologist or a Natural Resource Monitor. No project activities will begin until Travis AFB has received written approval from the Service that the biologist(s) is qualified to conduct the work.

-2. A Service-approved biologist will monitor construction activities in or adjacent to sensitive habitats as required. The biologist will ensure compliance with all applicable avoidance and minimization measures required to protect federally-listed species and their habitats. If federally-listed species are found that are likely to be affected by work activities, the Service-approved biologist will have the authority to stop any aspect of the project that may result in unauthorized take of a federally-listed species. If the biologist exercises this authority, they must coordinate this with Travis 60 CES/CEIE who will notify the Service and the California Department of Fish and Wildlife by telephone within 1 working day and in writing within 5 working days.

-3. A Service-approved biologist will conduct environmental awareness training for all construction personnel working within and near sensitive habitat on the Base. Training will be provided at the start of work, and within 15 days of any new worker arrival. The program will consist of a briefing on environmental issues relative to the proposed project. The training program will include an overview of the legal status, biology, distribution, habitat needs, and compliance requirements for each federally-listed species that may occur in the project area. The presentation will also include a discussion of the legal protection for endangered species under the Act, including penalties for violations. A fact sheet conveying this information will be distributed to all personnel who enter the project site. Upon completion of the orientation, employees will sign a form stating that they attended the program and understand all avoidance and minimization measures. These forms will be maintained at Travis AFB and will be accessible to the appropriate resource agencies;

-4. Construction activities will occur between 3 minutes after sunrise and 3 minutes before sunset unless otherwise specified in the proposed project description and analysis;

-5. At the end of every work day, trenches, pits, and excavations shall be provided with escape ramps constructed of earth fill or wooden planks at a 3:1 slope. Before such trenches, pits, and excavations are filled, they will be thoroughly inspected for trapped wildlife;

Service Notification

-4. Travis AFB will track the areal extent and location of impacts resulting from projects covered under the programmatic biological opinion, and will submit an annual report to the Service

listing each project covered and summarizing effects to each federally-listed species and their habitat on a project by project basis. Travis AFB will submit an annual report to the Service by February 15 of each year, for the previous year (over the next 5-years), that documents the following information:

- Summary of projects covered under the programmatic biological opinion;
- Federally-listed species occurrences and potentially suitable habitat in each proposed project area; and
- A summation of the total effect, including beneficial effects and associated compensation, on listed species and their habitat for each proposed project.

Seasonal Avoidance Procedures

CTS-7. Seasonal Avoidance - **Wet-Season rocedures** (October 16 – April 30): Work will not be conducted in the rain. The Service-approved Biologist will monitor the weather forecast and authorize work when the forecast indicates a period of dry days (5 to 10 days of no rain) before starting the project. The Travis Environmental Office will document through email notification to the Service when work will commence. The weather forecast and hourly weather data for Travis AFB will be monitored and can be found by entering the zip code 94535 (Travis AFB) at http://www.weather.gov. A Service-approved biologist will be on-site for morning inspections before the start of work. Morning inspections consist of examination of all trenches, pits, excavations, equipment, California tiger salamander exclusionary barriers (if present), all suitable upland habitat including refugia habitat such as small woody debris, refuse, burrow entries, etc. will be properly inspected, and all other areas within the project site. n addition, the project work crew will be notified to maintain vigilance regarding potential California tiger salamander activity. f feasible, the work crew will participate in the morning inspection(s). Modifications to this timing may be approved on a case-by-case basis by the Service.

CTS-8. Seasonal Avoidance **ry-Season Procedures** during Rain/High Humidity Events (May 1 October 15): Work will not be conducted if raining. The Service-approved biologist will check the National Weather Service by 6:00 AM on the day prior to a scheduled work day to see if there is a 50% or greater probability of rain forecasted overnight. If there is, then before work begins the next morning (after the rain event has stopped), the Service-approved biologist will conduct an even more extensive morning inspection. The inspection will include searching the work area and a wider perimeter of the area for presence of the species. n addition, the work crew will be notified to maintain vigilance regarding potential CTS activity. f feasible, the work crew will participate in the morning inspection(s). Modifications to this timing may be approved on a case-by-case basis by the Service. The weather forecast and hourly weather data for Travis AFB will be monitored at http://www.weather.gov.

CTS-9. If Dry-Season (May 1 October 15) night time work is necessary, the following additional conservation measures shall be implemented:

- Work will only occur within paved areas (greater than 20 feet from uplands);
- A 6-inch high exclusionary barrier for California tiger salamander will surround the work area during work, with ingress/egress access being the only break in the barrier;
- A Service-approved biologist will be on-site during all night time work and will routinely monitor the exclusionary barrier and the project site; and
- Work will not be conducted at night time if there is a 50% or more chance of rain predicted overnight;

Buffers and Site Restoration

-1. No work will be conducted within 250 feet of federally-listed vernal pool species' habitat during the wet-season (October 16 – April 30); unless specifically approved by the Travis AFB

Natural Resource Management Team who must first field verify soil saturation, visual ponding, and expected surface disturbance. The Service will be notified of any off-pavement work within the designated 250 foot buffer.

-5. All vernal pools, drainages, and wetlands, if present, will have erosion control measures (straw waddles, silt fencing) installed where hydrological continuity exists between the construction activities and the wetland. A Service-approved biologist will determine whether erosion control measures should be utilized, weighing the potential for effects to federally-listed species. Construction boundaries within the buffer will be designated with fencing or other suitable means to ensure no equipment and/or construction workers access protected wetland resources.

Prescribed urning

CCG. Prescribed fires will not occur in Contra Costa goldfields occupied habitat when the vegetation is green (April - June). Prescribed burns will be scheduled after Contra Costa goldfields plants have senesced and seed dispersal is complete.

Mowing

-2. Mowing will be completed in and around vernal pool habitat, after Contra Costa goldfields seeds set, but during the dry season (May 1 – October 15). Mowing conducted earlier in the season may be desirable to maintain appropriate conditions for vernal pool species including Contra Costa goldfields. If mowing occurs in or near vernal pools, it will occur only when the soil is no longer saturated to ensure tracks are not left in or near wetlands. The mower height will be set to avoid the flowering heads of sensitive vernal pool plant species. Populations of Contra Costa goldfields, and known California tiger salamander breeding ponds will be avoided during the spring and early summer months.

erbicide pplication

Herbicide application and invasive species management activities will comply with the Updated Invasive Plant Species Management Plan (note, changes to this plan are identified below. Travis AFB will implement additional buffers during herbicide application which were identified in their response letter dated, July 11, 2017; in an excerpt from the Solano RCD, titled *Invasive Plant Mapping and Management, 2016 nnual Activity Report*; and are also included below:

- Mechanical methods will be used for the removal of invasive plant species within 20 feet of the mapped wetlands. Herbicide treatment will not be applied within 20 feet from the edge of mapped wetlands, with the following exceptions: in areas where mechanical treatments within 20 feet of a wetland will not be effective in eliminating the infestation and herbicide application within this buffer is required when water is present in pools;
- Herbicide application will occur once pools are dry (May – June), allowing for a 4 to 6 month dry period;
- All mixing of herbicides will be conducted at least 150 feet from water and often off-Base;
- Herbicide applicators will prescribe and use only non-ionic surfactants near open water (i.e., TERGITOLTM 15-S surfactants);
- When spraying on roadsides, applicators will use a surfactant such as GROUNDED® that increases soil particle absorption and modulates droplet size to prevent soil mobility and decrease aerial drift to prevent movement of chemical into sensitive habitat areas; and
- Herbicides will be applied with a hand held backpack sprayer, targeted to hit only the pepperweed with a focused nozzle and careful application.

Minimization/Conservation Measures Proposed (Travis AFB's letter dated July 11, 2017):

1. Herbicides will only be administered b State Licensed Qualified Applicators;
2. The application of any pesticide, including herbicides will be conducted in accordance with approved Integrated Pest Management Plan, Updated Invasive Species Management Plan, and Integrated Natural Resources Management Plan which includes submission of monthly herbicide use reports, summarized in annual activity reports;
3. Herbicides will be applied according to the chemical manufacturer's instructions on the label, along with other applicable conservation measures. All mixing of herbicides will be conducted at least 150 feet from water.
4. Herbicide applicators will prescribe and use only non-ionic surfactants near open water. These surfactants are readily biodegradable and low in aquatic toxicity. An example is the TERGITOL™ 15-S surfactants b Dow; and
5. While spraying on roadsides, applicators will use a surfactant such as GROUNDED® that increases soil particle absorption and modulates droplet size to prevent soil mobility and decrease aerial drift; thus, preventing movement of chemical into sensitive habitat areas (primarily wetlands).

MM-6. All areas of upland ground disturbance or exposed soil will be reseeded with a native "weed-free" seed mix approved b the Travis AFB 60 CES/CEIE. Ground disturbance within vernal pools will require a restoration plan and 2 years of follow-up monitoring b a Service-approved biologist. Note, that direct impacts to wetlands require a Clean Water Act Section 404 permit issued b the U.S. Army Corps of Engineers and Section 401 permit from the State Regional Water Quality Control Board.

Additional Measures

MM-7. Off-road travel outside of the demarcated construction boundaries will be prohibited;

MM-8. Prior to initiation of construction activities, sensitive areas, such as vernal pools, wetlands, riparian areas, and potential habitat for federally-listed species (i.e., vernal pool fairy shrimp, tadpole shrimp, CTS, and Contra Costa goldfields), will be staked and flagged as exclusion zones where construction activities will not take place. Orange construction barrier fencing (or an appropriate alternative method) will designate exclusion zones where construction activities are prohibited. Flagging and fencing will be clearly marked as an "Environmentally Sensitive Area". The contractor will remove all fencing, stakes and flagging within 60 days of construction completion.

MM-9. Any worker that inadvertently kills or injures a federally-listed species, or finds one injured or trapped, will immediately report the incident to the on-site biologist. The biologist will inform the Travis AFB 60 CES/CEIE immediately, who will verbally notify the SFWO within 1 day, and will provide written notification of the incident within 5 days.

MM-10. Motor vehicles and equipment will only be fueled and serviced in designated service areas. All fueling and maintenance of vehicles and other equipment and staging areas will occur in a designated area with appropriate spill containment. Any newly established, project specific fueling and maintenance areas will be located at least 250 feet from any wetland/drainage habitat or water body. Prior to the onset of work, Travis AFB will ensure that a plan is in place that will allow for a prompt and effective response to any accidental spill. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur;

MM-11. During construction activities, all trash will be properly contained, removed from the work site daily, and disposed of properly. Following construction, all refuse and construction debris will be removed from work areas. All garbage and construction-related materials in construction areas will be removed immediately following project completion.

MM-12. Unless otherwise designated as part of a habitat restoration plan, all excess soil excavated during construction occurring near vernal pools and other wetlands will be removed and disposed of

outside the project area. Coordination with the Travis AFB 6 CES/CEIE and appropriate regulatory agencies is required prior to disposal of the excavated soil;

-13. The number of access routes, number and size of staging areas, and the total area of the activity will be limited to the minimum necessary to achieve the project goal. Routes and boundaries will be clearly demarcated, and these areas will avoid wetlands/drainage areas whenever feasible.

-14. All vehicle operators will follow the posted speed limit on paved roads and a 10-mile per hour speed limit on unpaved roads;

-15. No pets or non-military firearms will be allowed in the project area;

-17. No trenches will be left open at the end of the day; trenched areas will be compacted and restored to normal grade once the project is completed; and

-18. No work requiring vehicles/equipment will be done when the ground is soft enough where travel will cause depressions.

Furthermore, Travis AFB has agreed to limit the amount of disturbances that will occur in suitable habitats for the California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields. See the *Effects of the Action* section below for specific acreage amounts that will not be exceeded annually, or over a 5-year period.

Compensation Measures

Travis AFB proposes the following habitat compensation for adverse effects to the California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields, or their habitat (Table 3 below). These ratios are dependent on whether the proposed project results in adverse effects that are direct or indirect, and whether these adverse effects are temporary or permanent. Habitat compensation may be met by Travis AFB by purchasing habitat at a Service-approved Conservation Bank, or through the preservation and protection in perpetuity of high value habitat at an acquired site near the Base.

Table 3. Habitat Compensation Ratios for Direct and Indirect Effects to the California Tiger Salamander, Vernal Pool Fairy Shrimp, Vernal Pool Tadpole Shrimp, and Contra Costa oldfields.

Sp cies	Level of Effect		Compensation ratios
CTS Upland	Temporary		0.5:1 Preservation of Upland Habitat
	Permanent		2:1 Preservation of Upland Habitat
CTS Breeding	Direct		3:1 Preservation of CTS breeding habitat; and 2:1 (or 0.35 ac., whichever is greater) Creation of CTS breeding habitat
	Indirect		2:1 Preservation or creation of CTS breeding habitat
VPFS/VPTS*	Direct	High value	7:1 Preservation of existing VPFS/VPTS habitat
		Medium value	3:1 Preservation of existing VPFS/VPTS habitat
		Low value	1:1 Preservation of existing VPFS/VPTS
	Indirect		1:1 Preservation of existing VPFS/VPTS habitat
CCG**	Direct		7:1 Preservation of existing CCG habitat; and 2:1 Establish self-reproducing populations in protected habitat areas
	Indirect		1:1 Preservation of existing CCG habitat

*The compensation ratio may also be met by 6:1 or 2:1 preservation with a 1:1 creation component in the high and medium value conservation areas respectively.
**The restoration requirement may be met by establishing new CCG populations at a single-project mitigation site or by purchasing credits at an approved mitigation bank authorized to sell credits for this species in an amount equal to the 2:1 mitigation ratio.

Action Area

The action area is defined in 0 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 proposed project, the action area encompasses Travis AFB properties consisting of a main Base (Solano County) and

eight GSUs (Solano and Contra Costa counties). Travis AFB is situated on about 5,137 acres of fee-owned land with lesser interests (easements) on additional land surrounding the Base. The eight GSUs controlled by Travis AFB are the: Defense Fuel Supply Point Ozol (51.40 acres fuel facility within the Carquinez Strait, Contra Costa County); Potrero Hills Annex (24.81 acres former Nike missile site in the Potrero Hills, Solano County); Middle Runway Marker (1.86 acres airfield infrastructure, Solano County); Outer Runway Marker (0.23 acre airfield infrastructure, Solano County); Water Well 1 (1.75 acres well facility, Solano County); Cypress Lakes Golf Course (207.52 acres golf course facility, Solano County); and the Former Sacramento Northern Railroad Right-of-Way (70.00 acres - railroad right-of-way, Solano County).

Analytical Framework for the Jeopardy and Adverse Modification Analysis

Section 7(a)(2) of the Endangered Species Act requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of the federally-listed species covered in this consultation. "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

The jeopardy analysis in this programmatic biological opinion considers the effects of the proposed federal action, and any cumulative effects, on the range-wide survival and recovery of federally-listed species. It relies on four components: (1) the *Status of the Species*, which describes the range-wide condition of the species, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which analyzes the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the species; and (4) the *Cumulative Effects*, which evaluates the effects of future, non-federal activities in the action area on the species.

The following analysis places an emphasis on using the range-wide survival and recovery needs of the California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields, and the role of the action area in providing for those needs 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.

Analytical Framework Adverse Modification

Section 7(a)(2) of the ESA requires that federal agencies insure that any action they authorize, fund, or carry out is not likely to destroy or to adversely modify designated critical habitat. A final rule revising the regulatory definition of "destruction or adverse modification" (DAM) was published on February 11, 2016 (81 FR 7214). The final rule became effective on March 14, 2016. The revised definition states:

> "Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features."

The DAM analysis in this programmatic biological opinion relies on four components: (1) the *Status of Critical Habitat*, which describes the range-wide condition of the critical habitat in terms of the key components (i.e., essential habitat features, primary constituent elements, or physical and biological features) that provide for the conservation of the listed species, the factors responsible for that condition, and the intended value of the critical habitat overall for the conservation/recovery of the listed species; (2) the *Environmental Baseline*, which analyzes the condition of the critical habitat in the action area, the factors responsible for that condition, and the value of the critical habitat in the action area for the conservation/recovery of the listed species; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated and interdependent activities on the key components of critical habitat that provide for the conservation of the listed species, and how those impacts are likely to influence the conservation value of the affected critical habitat; and (4) *Cumulative Effects*, which evaluate the effects of future non-Federal activities that are reasonably certain to occur in the action area on the key components of critical habitat that provide for the conservation of the listed species and how those impacts are likely to influence the conservation value of the affected critical habitat.

For purposes of making the DAM determination, the Service evaluates if the effects of the proposed federal action, taken together with cumulative effects, are likely to impair or preclude the capacity of critical habitat in the action area to serve its intended conservation function to an extent that appreciably diminishes the rangewide value of critical habitat for the conservation of the California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields. The key to making that finding is understanding the value (i.e., the role) of the critical habitat in the action area for the conservation/recovery of these listed species based on the *Environmental Baseline* analysis.

Status of the Species

California Tiger Salamander
For the most recent comprehensive assessment of the California tiger salamander's range-wide status, please refer to the *California Tiger Salamander Central California Distinct Population Segment (Ambystoma californiense) 5-year Review: Summary and Evaluation* (Service 2014), and the *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (Ambystoma californiense)*, signed June 06, 2017 (Service 2017). No change in the California tiger salamander's listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2014; 5-year review was finalized, with loss of habitat being the most significant effect. While there continue to be losses of California tiger salamander habitat throughout its range, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for this species.

Vernal Pool Fairy Shrimp
For the most recent comprehensive assessment of the vernal pool fairy shrimp's range-wide status, please refer to the *Vernal Pool Fairy Shrimp (Branchinecta lynchi) -year Review: Summary and Evaluation* (Service 2007a). No change in the species' listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2007 5-year review was finalized, with loss of habitat being the most significant effect. While there continue to be losses and fragmentation of vernal pool habitat throughout these species range, to date no project has proposed a level of effect for which the Service has issued a biological opinion of jeopardy for the species. The Service is in the process of finalizing its most current 5-year review for this species.

Vernal Pool Tadpole Shrimp
For the most recent comprehensive assessment of the vernal pool tadpole shrimp's range-wide status, please refer to the *Vernal Pool Tadpole Shrimp (Lepidurus packardi) 5-Year Review: Summary and Evaluation* (Service 2007a) for the current Status of the Species. No change in the species' listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2007 5-year review was finalized, with loss of habitat being the most significant effect. While there continue to be losses and fragmentation of vernal pool habitat throughout these species range, to date no project has proposed a level of effect for which the Service has issued a biological opinion of jeopardy for the species. The Service is in the process of finalizing its most current 5-year review for this species.

Contra Costa Goldfields
For the most recent comprehensive assessment of Contra Costa Goldfields' range-wide status, please refer to the *ontra Costa Goldfield (Lasthenia conjugens) 5-Year Review: Summary and Evaluation* (Service 2013) for the current Status of the Species. No change in the species' listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2013 5-year review was finalized, with loss of habitat being the most significant effect (See *Environmental aseline* section below for further threats to the species). While there continue to be losses and fragmentation of vernal pool habitat throughout these species range, to date no project has proposed a level of effect for which the Service has issued a biological opinion of jeopardy for this species.

Environmental Baseline

Travis AFB is located about 62 feet above mean sea level, and is near the Carquinez Strait; a major break in the Coast Range that allows the ocean to moderate temperatures. The climate at Travis AFB is Mediterranean; with wet winters and dry summers, with a mean annual temperature of 68°F (mean monthly temperature ranges from 37°F in December to 89°F in August). Monthly mean relative humidity typically ranges from a low of 50% in June, to a high of 77% in January (https:\\weatherspark 2017).

Travis AFB's main development area is clustered on the west side of the airfield, which spans diagonally from southwest to northeast. The north side of the airfield is primarily used for airfield operations and maintenance, with some industrial and outdoor recreation areas. Currently at Travis AFB, there is a combination of administrative, community, open space, recreation, industrial, and airfield operations and maintenance uses. Industrial land uses are scattered across the Base, but are concentrated in the southwest. The perimeter of the installation is mostly characterized by open space except in the north, where accompanied housing is clustered closely together. Medical land uses are concentrated at the David Grant Medical Center along Air Base Parkway.

Seasonal wetlands and vernal pools located on the Base are known to support the California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields. Terrestrial habitats at Travis AFB consists of annual grasslands (main vegetation community present), early successional ruderal, and riparian. The undeveloped upland annual grassland areas on the Base are known to support the California tiger salamander.

Travis AFB is located on a nearly level to gently rolling terrace; therefore, many pools are hydrologically connected. Wetlands, vernal pools, streams, drainages, and other aquatic resources, are scattered throughout Travis AFB. These aquatic resources include almost 6 miles of streams and ditches, 4 ponds, over 700 vernal pools and swales, and nearly 9 other seasonal wetland features.

The water restrictive layer in Northern claypan vernal pools, like the ones found on Travis AFB, is formed by a surface clay layer rather than a duripan type subsurface structure (Rains *et al.* 8). Vernal pool hydrology is therefore controlled primarily by surface water runoff. Subsurface flows have limited importance in maintaining hydroperiods in vernal pools associated with the action area.

Seasonal wetland, annual grassland, riparian and marsh habitat in Union Creek surround the airfield on Travis AFB, and is actively managed to reduce its suitability to wildlife for aircraft safety reasons. Vegetation clearing in Union Creek along its bed and banks is conducted periodically to remove vegetation since mowing/cutting is difficult to accomplish because of the steepness of slopes along much of the drainage. Additionally, grassland and vernal pool vegetation along the runways and taxiways (up to a distance of 800 feet from their edge) are maintained at a height of 7 to 4 inches. All shrubs and brush within this zone are removed. Vegetation clearing occurs in the fall after the migratory bird nesting season has concluded, but prior to the first rains of the season. Vegetation is removed along the bed of Union Creek either by hand, using hand tools where the bed is inaccessible to heavy equipment, or with the use of an excavator to pull vegetation from the channel bottom. All material removed from Union Creek is placed directly in a truck and hauled off the Base at the end of each work day.

Travis AFB has mapped wetlands that may be considered habitat for some of the listed species across the Base and its GSUs. Much of the vernal pool grasslands on Travis AFB have been subject to extensive disturbance over at least the past century including: land leveling for past agricultural uses; grading for development and drainage improvements; paving and excavation to establish and improve roads and runways; installation of pipelines, wells, and other utilities; and other past and current land uses. The soil surface over most of the vernal pool grasslands has been modified by these activities, eliminating the natural mima mound topography normally present in the grasslands. However, in most if not all areas, the underlying claypan remains intact. In areas with the appropriate surface topography, water can pond at the soil surface in depressions creating a seasonal wetland feature with representative aquatic plant and animal species. Upland habitat surrounding vernal pools on Travis AFB is dominated by non-native annual grass and forb species, and the pools themselves support both native and non-native species (such as various bromes, ryegrass, medusahead and perennial pepperweed).

An extensive survey was conducted on the main Base in 2017, to categorize and quantify vernal pool habitat as either providing high, medium or low habitat conservation values for vernal pool species (See Figure 3). Emulating what was done for the jurisdictional area covered in the draft Solano County Multi-species Habitat Conservation Plan (Solano HCP); Travis AFB has surveyed and categorized habitat on the Base and its GSU's into three habitat conservation value categories (high, medium and low value conservation areas; see Figure 3). This methodology is based on a number of existing criteria including: (1) disturbance levels; (2) distribution of federally-listed species; (3) unique or uncommon habitat features; (4) proximity to existing and proposed Preserves/Reserves; (5) presence of physical barriers; (6) located in Core Recovery Areas and/or designated critical habitat; and (7) corridors and linkage areas. Based on this methodology, Travis AFB classified and mapped vernal pool conservation areas. Currently, there are 729 acres of high value vernal pool habitat, 920 acres of medium value vernal pool habitat, and 1,559 acres of low value vernal pool habitat located at Travis AFB (see map in Figure 3). Specific criteria used to categorize habitat conservation values as either high, medium, or low is provided below:

High Value Vernal Pool Conservation Areas; 729 acres present:

- Large blocks (greater than 100 acres) of vernal pool complexes and associated habitats with low to moderate levels of disturbance, and containing or potentially supporting federally-listed species;
- Unique or uncommon habitat features (such as large playa pools or lakes, alkali flats, and unique soil types) and areas with high concentrations of federally-listed species and biological diversity;
- Moderately to highly disturbed habitats, within and adjacent to, moderate to high quality vernal pool complexes that have a high potential for restoration and enhancement of vernal pools and associated habitats;
- Complexes that support isolated populations of extremely rare or range-limited species and/or core populations of Contra Costa goldfields regardless of size, level of disturbance or existence of barriers;
- Areas that may serve as corridors or linkages between other high value lands; and
- Areas designated in the Integrated Natural Resource Management Plan (INRMP) as on-Base Preserves.

Medium Value Vernal Pool Conservation Areas; 920 acres present:

- Watershed and buffer lands to High Value Conservation Areas;
- Areas that support (or may support) populations of more common and widespread listed species (e.g. vernal pool fairy shrimp);
- Sites of limited size that are isolated and/or subject to significant anthropogenic pressures, and the potential for restoration is limited.

Low Value Vernal Pool Conservation Areas; 1,559 acres present:

- Small, infill parcels surrounded by existing development;
- Little or no connectivity to medium or high value conservation areas;
- Areas with extensive soil disturbance that has impacted underlying claypan; and
- Areas that have been surveyed using appropriate protocols with no known records of federally-listed species.

Federally-Listed Species:

California Tiger Salamander and its Critical Habitat

Presence within the Action Area: Based on California tiger salamander occurrences reported by Travis AFB and documented on the California Natural Diversity Database (CNDDB), this species is known to breed in ponds and vernal pools located on the Base (See Figures 5 and 6 of the Enclosure; CNDDB 2017). Much of the grassland habitat on Travis AFB and on its GSUs provides suitable aestivation habitat for the California tiger salamander (Figure D-1 of the programmatic biological assessment). The presence of suitable habitat for the California tiger salamander, and documented occurrences suggests that the species is likely to persist on Travis AFB given current conditions. Documented California tiger salamander breeding habitat is concentrated in the Castle Terrace Preserve (former Burke Property) in the far northern portion of the Base (Marty 2016).

During relocation efforts conducted from May 31- July 20, 2017, 874 juvenile California tiger salamanders were documented originating and migrating from an off-Base breeding pond and onto the northeastern portion of the Base (Figures 5 and 6). Furthermore on January 29, 2014, an adult California tiger salamander was reported on CNDDB in the same area of the Base traveling west from private lands towards the interior of Travis AFB. This occurrence indicates that this area is a California tiger salamander migratory pathway, which encompasses Runway 21L, the Assault Landing Zone (ALZ), and portions of Perimeter Road (Base road). Additionally, on July 5 and July 8, 2015, two dead California tiger salamanders were found on the eastern portion of the Base.

These two individuals were most likely responding to either ponded water, as a result of a break in a water main near suitable upland habitat, humid weather conditions, or both. In the early morning hours of February 4, 2017, a California tiger salamander was observed crossing the ALZ (CNDDB 2015). All of these indicate that California tiger salamanders are aestivating and dispersing through the upland habitat on the eastern portion of the Base.

The California tiger salamander has also been observed in breeding ponds located at the Wilcox Ranch and Muzzy Ranch. Travis AFB is located within the 1.3 mile migration range for the California tiger salamander (CH2M Hill 2006, CNDDB 2016). Marty (2016) found CTS larvae in a stock pond located adjacent to the Base's northern boundary (property owned by the City of Fairfield and Solano County). As part of that same study, Marty used aerial photo interpretation and inspection of 2015-2016 hydrology to assess potential California tiger salamander breeding ponds on private property adjacent to Travis AFB, and determined that three ponds on the southern boundary of the Base have a high probability of providing breeding habitat (Figure D-1 of the programmatic biological assessment). Mantech (2016) conducted non-protocol level surveys on Travis AFB GSUs and found potential habitat for the California tiger salamander at the Former Sacramento Northern Railroad Right-of-Way, Outer Runway Marker, Middle Runway Marker, and Potrero Hills Landfill GSUs. Critical habitat is also designated for the California tiger salamander on a section of the Railroad Right-of-Way GSU, managed by Travis AFB (See Figure 4).

A set of tools developed by The Nature Conservancy, called the Resistance and Habitat Calculator Toolset (part of Gnarly Landscape Utilities), was used to create a map of landscape resistance for the California tiger salamander on Travis AFB (McRae et al. 2013). The following criteria were used to define areas as either having a high, medium or low (red, yellow, or green, respectively) risk potential for encountering a California tiger salamander: (1) relative habitat and resistance values were assigned to different landscapes (ranging from zero resistance to 100 for high resistance); (2) a migration distance of 1.3 miles from known breeding ponds was used for the species; and (3) known occurrences of the species. A map of these resistance values (green, yellow, or green CTS risk areas) is included in Figure 2 The methodology used is based on the migration distance of the species from known breeding sites, and is further described in Appendix A of the programmatic biological assessment. Currently within both developed and undeveloped areas at Travis AFB, there is a total of 2,546 acres in red risk, 507 acres in yellow risk, and 1,955 acres in green risk areas for encountering California tiger salamander. Based on habitat suitability mapping in undeveloped areas only, there are about 2,192 acres in the red risk areas, 279 acres in the yellow risk areas, and 1,096 acres in the green risk areas. See Appendix A of the programmatic biological assessment for a detailed description of risk areas developed for the California tiger salamander.

Current and Historical Distribution: Although the historical distribution of the California tiger salamander is not known in detail, their current distribution suggests that they may have been continuously distributed along the low-elevation grassland-oak woodland plant communities of the San Joaquin-Sacramento river valleys and foothills. The California tiger salamander occurs from on the Central Valley floor near sea level, up to a maximum elevation of roughly 3,940 feet in the Coast Ranges and 1,640 feet in the Sierra Nevada foothills (Shaffer et al. 1993; Shaffer et al. 2013).

Threats: Multiple factors have contributed to population declines of the California tiger salamander. The primary threats to this species are loss, degradation, and fragmentation of habitat as the result of human activities. Aquatic and upland habitat available to the species has been degraded and reduced in area through agricultural conversion, urbanization, road construction, and other projects. Further threats to the California tiger salamander include predation from, and competition with, invasive species; hybridization with nonnative barred tiger salamanders (*Ambystoma tigrinum*) (sometimes

referred to as *Ambystoma tigrinum mavortium*); mortality from road crossings; contaminants; and small mammal burrow control efforts. Additional threats include introduction of diseases such as ranaviruses and chytrid fungi, and also climate change (Service 2004, 2014). Furthermore, the species' low recruitment and high juvenile mortality makes it particularly susceptible to habitat loss, fragmentation, urbanization, and construction related harm and mortality.

Recovery Plan: In the *ecovery Plan for the Central California Distinct opulation egment of the California Tiger Salamander (Ambystoma californiense) une 06, 2017*, actions are identified to sufficiently reduce the threats to the species. The recovery objectives listed in the plan are to: secure self-sustaining populations of the California tiger salamander throughout the full range of the DPS, ensuring conservation of native genetic variability and diverse habitat types (e.g., across elevation and precipitation gradients); ameliorate or eliminate the threats that caused the species to be listed, and any future threats; and restore and conserve a healthy ecosystem supportive of the species. Specific actions needed to recover the California tiger salamander include the following: 1) maintain current distribution of species; 2) maintain native genetic structure across the species range; 3) minimize road mortality; 4) minimize potential for disease introduction; 5) minimize non-native predator populations; 6) ensure adaptive management and monitoring of habitat; and 7) conduct research.

The Service (2004) recognizes that livestock grazing is for the most part compatible with the continued successful use of rangelands by the California tiger salamander, provided the grazed areas do not also have intensive burrowing rodent control efforts. Grazing animals can be used as a tool to reduce invasive nonnative plant species; thus, improving habitat for the California tiger salamander. For example, taller grass, or grass with significant thatch build-up, may make dispersal difficult for migrating California tiger salamanders and have been associated with declines in ground squirrel populations (EDAW 2008; Ford et al. 2013).

Vernal Pool Fairy Shrimp and its Critical Habitat

Presence within the Action Area: In the Solano-Colusa Vernal Pool Region, vernal pool fairy shrimp are reported on the greater Jepson Prairie, which includes the Wilcox Ranch, as well as near Vacaville and Dixon in Solano County (CNDDB 2017) (Figures 5 and 6). Vernal pool fair are known to occur on Travis AFB and much of the seasonal wetland habitat on the Base and their GSUs provide suitable habitat for the species (Figure A-1 of the programmatic biological assessment). The presence of suitable habitat for the species and documented occurrences suggests that the species is likely to persist on Travis AFB given current conditions. On Travis AFB there are 45 documented occurrences of vernal pool fairy shrimp. These occurrences are concentrated within the northern portion of the Base; though, a number of other occurrences are scattered throughout the center of the Base in natural vernal pools, as well as manmade seasonal wetland features (Marty 2016).

A 1993 survey of the vernal pools in the southwest part of Travis AFB identified adult vernal pool fairy shrimp and its cysts (eggs of this species). A subsequent survey by BioSystems Analysis, Inc. (1994) identified adult vernal pool fairy shrimp on the Base. Base-wide surveys conducted by EcoAnalysts, Inc. (2006) from 2004 to 2006 identified vernal pool fairy shrimp at several locations, mostly on the western side of the Base. During these protocol-level surveys, vernal pool fairy shrimp were identified in a total of eight locations on the Base. Most vernal pool fairy shrimp occurrences were on the western side of the Base. Two large populations of adult vernal pool fairy shrimp have been observed in a roadside pool, and a drainage ditch along the abandoned railroad tracks on the northern side of Hangar Avenue and the eastern side of Union Creek. Additionally, low numbers of adult vernal pool fairy shrimp have been observed in the following locations: five vernal pools west of Union Creek; in a wet depression along the railroad right-of-way at Meridian

Road; in one pool north of the Runway 03R/21L; and in vernal pools along the Railroad Right-of-Way GSU north of the Base.

Protocol-level surveys of the vernal pool habitat around the former Aero Club conducted by ICF International from 2011-2013 found no vernal pool fairy shrimp (ICF International 2011, 2013). Marty (2016) conducted surveys of 142 wetlands during the 2015-2016 wet season and recorded 16 pools with vernal pool fairy shrimp and 1 pool with a close relative, the midvalley fairy shrimp (*B. mesovallensis*). Mantech (2016) conducted non-protocol level surveys of the Travis AFB GSUs and found potential habitat for this species at the Former Sacramento Northern Railroad Right-of-Way, Outer Runway Marker, Middle Runway Marker, and Point Ozol. Critical habitat is designated for vernal pool fairy shrimp on the Travis AFB main Base at the South Gate; a triangular parcel south of Runway 03R/21L (not within the fenced boundary of the Base); and at the Western Railroad Right-of-Way as well as the Potrero Hills Landfill GSU (Figure 4).

Current and Historical Distribution: Vernal pool fairy shrimp are known to occur in a wide range of vernal pool habitats in the southern and Central Valley areas of California, and in two vernal pool habitats within the "Agate Desert" area of Jackson County, Oregon. It is likely the historical distribution of this species coincides with the historical distribution of vernal pools in California's Central Valley and southern Oregon. Holland (1998) estimated that about 4,000,000 acres of vernal pool habitat existed in the Central Valley prior to the widespread agricultural development that began in the mid-1800s. He found that although the current and historical distribution of vernal pools is similar, vernal pools are now far more fragmented and isolated from each other than during historical times and currently occupy only about 25 percent of their former land area (Holland 1998). The current distribution of the vernal pool fairy shrimp in the Central Valley may be similar to its historical distribution in extent, but remaining populations are now considerably more fragmented and isolated than in pre-agricultural times.

Threats: The primary threats to the species are habitat loss and fragmentation due to urban development on the private property where the species occurs, agricultural conversion, altered hydrology, nonnative invasive species, inadequate regulatory mechanisms, exclusion of grazing in areas where grazing has been a historically occurred, and inappropriate grazing regimes (overgrazing or undergrazing) (Service 2005).

Recovery Plan: The *Recovery Plan for Vernal Pool Ecosystems for Vernal Pool Ecosystems of California nd Southern Oregon* identifies conservation actions (divided into five categories) to sufficiently reduce the threats to the species (Service 2005). These categories are to continue to provide: regulatory and legal protections; education and outreach; research; conservation planning and habitat protection; and species-specific management and monitoring for the species.

Venal Pool Tadpole Shrimp and its Critical Habitat

Presence within the Action Area: Vernal pool tadpole shrimp are known to be present in much of the undeveloped areas surrounding Travis AFB. The CNDDB includes multiple reports of the species within 0.50 mile surrounding the Base (Figures 5 and 6; CNDDB 2016). Some observations include those at Wilcox Ranch adjacent to the Base, Muzzy Conservation Bank, North Suisun Conservation Bank, and the Burke Ranch Conservation Bank.

Despite numerous protocol-level and non-protocol-level sampling efforts over the past 20 years, vernal pool tadpole shrimp have not been found on the main Base; although, this species has been found on the Northern Railroad Right-of-Way GSU, located just off the main Base near the Meridian Gate on the eastern boundary (Figure B-1 of the programmatic biological assessment).

During 2004-2005 surveys conducted by EcoAnalysts, this species was observed at eight locations along the Northern Railroad Right-of-Way GSU. In 1994, Biosystems found vernal pool tadpole shrimp in one pool located about 40 feet from the Base's perimeter fence, near the Meridian Gate on the eastern Base boundary (Biosystems 1994). Mantech (2016) conducted non-protocol level surveys of the Travis AFB GSUs. These surveys indicate that suitable habitat for vernal pool tadpole shrimp likely exists at the following GSU's: Former Sacramento Northern Railroad Right of Way; Outer Runway Marker; Middle Runway Marker; and the Defense Fuel Supply Point Ozol. Critical Habitat is designated for vernal pool tadpole shrimp on Travis AFB at the South Gate; a triangular parcel south of Runway 03R/21L (not within the fenced boundary of the Base); the Western Railroad Right-of-Way; and the Potrero Hills Landfill GSU (Figure 4).

Current and Historical Distribution: Historically, about 4,000,000 acres of vernal pool habitat existed in the Central Valley during pre-agricultural time, and vernal pool tadpole shrimp were probably distributed over most of these vernal pool habitats. However, surveys in southern portions of California have never revealed vernal pool tadpole shrimp populations, and the species probably did not occur historically outside of the Central Valley and Central Coast regions (Service 2005). Currently vernal pool tadpole shrimp are distributed across the Central Valley of California and in the San Francisco Bay area. The species' distribution has been greatly reduced from historical times as a result of widespread destruction and degradation of its vernal pool habitat. Vernal pool habitats in the Central Valley now represent only about 25 percent of their former area, and remaining habitats are considerably more fragmented and isolated than during historical times (Holland 1998). Vernal pool tadpole shrimp are uncommon even where vernal pool habitats occur. In 1998, Helm found vernal pool tadpole shrimp in only 17 percent of vernal pools sampled.

Threats: The primary threats to the species are habitat loss and fragmentation due to urban development on private property where vernal pool tadpole shrimp occur in Alameda County. Additional threats to this species are: habitat conversions for agriculture; altered hydrology; competition with nonnative invasive species; inadequate regulatory mechanisms; exclusion of grazing in areas where grazing has historically occurred; and inappropriate grazing regimes (overgrazing or undergrazing) (Service 2005).

Recovery Plan: The *ecovery Plan for ernal Pool Ecosystems for ernal Pool Ecosystems of California nd Southern Oregon, 2005* states that although conservation efforts have been implemented for vernal pool ecosystems in general; very few actions have been taken specifically to benefit vernal pool tadpole shrimp (Service 2005).

Contra Costa Goldfields and its Critical Habitat

Presence within the Action Area: Rare plant surveys conducted by Biosystems (1994) counted 36 separate occurrences of Contra Costas goldfields on Travis AFB, concentrated on the western portion of the Base. The majority of plants (33 of 36 plants) are located at the former Aero Club and in the grazing areas south of the Aero Club. The remaining occurrences are found in the southwestern corner of the Base along Perimeter Road at the end of the runway (CH2M Hill 2006).

Contra Costa goldfields distribution on Travis AFB included pools within the Aero Club area. In 1999, the Service issued a biological opinion following the loss of individual Contra Costa goldfields, and damage to its habitat in 1997 at the Aero Club and Civil Engineering Training Yard, and to mitigate impacts related to the Castle Terrace Housing project (referred to then as the Burke Property) (Service 1999). The biological opinion required the restoration and/or creation of on-site and off-site habitat for Contra Costa goldfields, as well as the purchase of credits at a vernal pool conservation bank. The resulting Contra Costa goldfields habitat restoration and compensation

entailed the creation of 256 vernal pools around the Aero Club (Collinge 1999). Additionally, Travis AFB has restored and is permanently protecting 0.2 acre of potential Contra Costa goldfields habitat on the main Base. During 2005 surveys and restoration project data collection, Contra Costa goldfields were documented in 43% of reference pools within the Aero Club, and in 39% of created pools (CH2M Hill 2005).

In total, 462 occurrences have been recorded for Contra Costa goldfields on Travis AFB over the years. In 2016, a total of 62 pools on Travis AFB were occupied, of which 80% of those occurrences were within the Aero Club (Marty 2017; Figures E-1 and E-2 of the programmatic biological assessment). The species has also been found in pools totaling about 28 acres, all on the western portion of the Base. Critical habitat is designated for Contra Costa goldfields on the main Base at: the South Gate; a triangular parcel south of Runway 03R/21L; and at the West Railroad Right-of-Way extending to Walters Road (Figure 4 of the Enclosure).

Current and Historical Distribution: Of the 32 historical occurrences of Contra Costa goldfields recorded between 1884 and 2003 that are documented on the CNDDB (2005), 22 are likely extant. Contra Costa goldfields occurred historically in seven vernal pool regions: Central Coast, Lake-Napa, Livermore, Mendocino, Santa Barbara, Santa Rosa, and Solano-Colusa (Service 2005; Keeler-Wolf et.al. 1998). In addition, several historical occurrences in Contra Costa County are outside of the defined vernal pool regions (Keeler-Wolf et al. 1998, CNDDB 2003). The species presumably remains in all of the vernal pool regions where it occurred historically, except for the Santa Barbara Vernal Pool Region. The greatest concentration of Contra Costa this species occurs is in the Solano-Colusa Vernal Pool Region on area located east of Fairfield, Solano County. This location contains 10 occurrences that are presumed extant, plus 1 that may be extirpated (Service 2005).

Threats: Current threats to Contra Costa goldfields include loss of habitat due to conversions for residential development, agriculture and vineyards, inappropriate grazing practices, and expansions drainage channels, landfill and highways. Some projects, such as proposed highways, may disturb habitat on Travis AFB as well as in the Fairfield area (Service 2005). Threats due to conversions to vineyards are also continuing. The largest Napa County occurrence of this plant, at Soscol Ridge is imminently threatened by vineyard conversion (Service 2005) (Figures 5 and 6; CNDDB 2017). Additionally, competition from invasive plant species, improper or lack of grazing regimes, climate change/drought, intensive grazing and lack of grazing are significant threats to this species (Service 2005). Heavy grazing is cited as a threat to Contra Costa goldfields occurring at Pacific Commons Preserve in Alameda County, and for four occurrences in Solano County, including the Gentry property (CNDDB 2012). Additionally, lack of grazing is cited as a threat for this plant species at Soscol Ridge in Napa County (CNDDB 2012). Both lack of grazing and excessive grazing may cause an increase in organic matter in the habitat that can eliminate the natural vernal pool invertebrate community and promote opportunistic and invasive nonnative plant species (Service 2013).

Recovery Plan: The *ecovery Plan for Vernal l Ecosystems for Vernal l cosystems of California and Southern regon 2005* provides recovery criteria that either directly or implicitly address three of the listing factors noted in the final rule to list the species: destruction, modification, or curtailment of habitat or range; inadequacy of existing regulatory mechanisms; and other man-made or natural factors affecting its continued existence (Service 2005). The overutilization for commercial, recreational, scientific, or education purposes, and disease or predation, were not included as threats in the listing rule and are not addressed in the Recovery Plan for Contra Costa goldfields. Since the Recovery Plan for this species has only recently begun to be implemented, species surveys and

monitoring efforts that will provide data to evaluate progress towards recovery have not yet occurred (Service 2005).

Effects f the Action

Activities described in the *Description of the Proposed Action* section may result in direct and indirect; permanent and temporary effects to federally-listed species and their habitat occurring at Travis AFB and the eight GSUs owned/managed by the Base (Table D-1 of the Enclosure). Each project proposed for coverage under the programmatic biological opinion was analyzed for the level of effect it may have on each of the federally-listed species and their habitat found on Travis AFB and its GSUs. For the California tiger salamander in particular, Travis AFB has divided the Base lands into three risk categories for encountering the California tiger salamander: green, yellow, and red (Figure 2). See the *Environmental Baseline* section for a summary, and Appendix A of the programmatic biological assessment for an expanded discussion of these risk categories and the methodology used to develop them. A combination of the California tiger salamander risk categories, federally-listed species habitat evaluations, and implementation of the proposed conservation measures and activities proposed are used to determine possible effect levels to federally-listed species and their habitat.

Measures described in the *Conservation easures* section, and additional species-specific measures included in Tabs A, B, D and E of the programmatic biological assessment will be implemented to minimize or avoid potential adverse effects to the California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields or their habitat. Furthermore, the following strategies will be followed during project development and implementation: 1) the project footprint will be reduced to the minimum area needed; 2) project boundaries will be clearly demarcated prior to work; 3) worker education programs to recognize and report federally-listed species will be conducted; 4) a Service-approved biologist will be on-site during project activities that have potential to result in take; 5) a relocation plan for any California tiger salamanders found will be implemented; 6) when feasible disturbed sites will be restored and revegetated with a native weed-free seed mix and/or native plant species; 7) if mowing is implemented in suitable habitat for federally-listed species, it will be occur during the dry-season; 8) if herbicide are used, it will only be applied using non-ionic surfactants when near water; and 9) if prescribed burning occurs, it will be timed to occur after Contra Costa goldfields has senesced and seed dispersal (March June; Ornduff 1966, Service 2005) is complete.

Additionally, habitat enhancement and restoration projects at Travis AFB may adversely affect individual California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields, or temporarily affect their habitat as described in the *Ground Disturbance nd Construction* section below. However, the long-term benefits of restoration and conservation are anticipated to provide these federally-listed species with protection and managed habitat in perpetuity; improve habitat quality and suitability; increase species population size; increase extent of protected habitat; and increase connectivity for species between occupied areas.

The habitat compensation ratios proposed by Travis AFB included in this section for projects adversely affecting either the California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, or Contra Costa goldfields were informed by the Solano HCP (SCWA 2012). However, some of the compensation ratios proposed by Travis AFB are scaled to reflect the Air Force's commitment to conserving listed species on the Base and its GSU's through the implementation of the INRMP. Through this natural resource management process, the Air Force funds management, monitoring and research activities that benefit listed species and ultimately

contribute to their recovery. The habitat compensation ratios proposed by Travis AFB in this section are dependent on the quality of the existing habitat which will be affected by proposed projects.

Habitat compensation ratios for the vernal pool fairy shrimp and the vernal pool tadpole shrimp are based on the mitigation ratios developed in the Solano HCP (SCWA 2012). Travis AFB's compensation ratios are centered on habitat preservation, with an additional 1:1 preservation component for projects indirectly effecting either medium or high value vernal pool conservation habitat. The Air Force believes that preservation of vernal pool habitat is a more suitable compensation measure than creation of habitat, which is often done in areas with existing species habitat and may have negative effects to species that use the upland habitat where the wetlands are created (e.g. California tiger salamander) and the watershed in general. Additionally, increasing wetland acreage through wetland creation in mitigation banks and other preserved properties near Travis AFB runways may increase the bird aircraft strike hazard.

Effects to the California Tiger Salamander

Travis AFB has determined that the following list of activities described below and in the *Description of the Proposed Action* section, have the potential to result in temporary and permanent adverse effects to the California tiger salamander and its habitat: airfield and flight operations; security and antiterrorism operations; road maintenance; bridge construction and maintenance; runway, taxiway and ramp repair; facility maintenance and upgrade; demolition; above and under -ground utility lines; culverts and drainage ditches; fence installation, maintenance and replacement; minor construction projects; ERP site investigations and remediation methods; ERP site operations and maintenance; ERP groundwater monitoring; invasive and pest species removal; California tiger salamander burrow and inspection and relocation; wetland restoration; fire suppression; firebreak maintenance; and prescribed fire (Table 6, and Table D-1 of Tab D). The effects analysis for the California tiger salamander is primarily based on the location of the proposed projects, relative to known species observations and/or proximity to breeding habitat for the species (Figure 2).

Ground Disturbance and Construction/Demolition

Ground disturbance and construction activities described in the *Description of the Proposed Action* section may result in temporary or permanent loss of water bodies utilized by the California tiger salamander for breeding and maturation of tadpoles to metamorphs, as well as loss of upland habitat used for aestivation, dispersal, and foraging. Additionally, suitable small mammal burrows or soil cracks (potential aestivation habitat) within construction footprints may contain the California tiger salamander, which are likely to be entombed and killed as burrows and soil cracks are destroyed during grading and ground compaction activities.

The California tiger salamander may be killed or injured from accidental trampling by workers from foot traffic and operation of construction equipment during construction activities. Construction activities may result in harassment from noise, vibration, and night-lighting and may disrupt their natural behaviors causing them to leave their upland refugia and increase their exposure to desiccation and predation. California tiger salamanders may also become trapped in open excavations or construction trenches, making them vulnerable to desiccation, starvation, and predation. Implementation of proper conservation measures and species-specific conservation measures will avoid or minimize habitat alteration and destruction and loss of individuals, including reducing construction footprints (See the *Conservation Measures* section above and species-specific measures listed in Tab D of the programmatic biological assessment).

Ground disturbing activities may cause alterations in hydrology that result in converting a vernal pool to a perennial pond, increasing the likelihood of the pond being colonized by predators and hybrids; thus, exposing California tiger salamanders to increased harassment and mortality from predators and possibly lead to their extirpation from a breeding site. In efforts to avoid these potential adverse effects to the species and its habitat, seasonal breeding sites will not be converted to perennial water bodies, and will not create new perennial ponds in the vicinity o species occurrences. Implementing ongoing actions to keep perennial water bodies free o predatory invasive species may result in overall benefits to the California tiger salamander and its habitat.

Temporary adverse effects to the California tiger salamander and its habitat may result from vernal pool and seasonal wetland restoration projects from associated grading, excavation, disking, trenching, or other types o direct ground disturbances. Monitoring o restoration sites will be monitored for success o restorative efforts for a minimum o 2 years. In general, restoration projects conducted at Travis AFB are expected to have overall benefits to the California tiger salamander by restoring their destroyed or altered habitat, and by enhancing existing habitat. In addition, while most of the ERP sites on Travis AFB have been cleaned up and closed, some sites may require further action and operations and maintenance. See the *Description of the roposed Action* section for specific activities, including ground disturbing activities, which may adversely affect the California tiger salamander and its habitat.

California Tiger Salamander Relocation Activities
Preconstruction surveys and relocation of California tiger salamanders may reduce injury or mortality within proposed project footprints; however, death and injury o individuals can result at the time o relocation efforts or later subsequent to their release. Although survivorship for relocated California tiger salamanders has not been determined; survivorship of relocated wildlife, in general, is lower because o intraspecific competition; lack o familiarity with the new location including breeding sites; feeding and sheltering habitats; increased risk o contracting disease in a foreign environment; and the risk o predation. Furthermore, improper handling; containment; lack of disease prevention measures; or improper transport o individuals can occur during relocation activities. In order to reduce or prevent these potential adverse effects from occurring, a Service-approved biologist with experience handling this species will conduct these activities. dditionally, the Service-approved biologists will follow *Travis A 's CTS Relocation lan*, and will limit the duration of handling and ensure that all California tiger salamanders are released in a timely manner, in order to further reduce potential adverse effects to the species.

Airfield and light Operations - Roads, Runways and ther Impediments to Dispersal
Projects that involve roads and highways can result in vehicle caused mortality of individual California tiger salamanders, and can cause habitat fragmentation. Injury and mortality occur when California tiger salamanders cross roads, runways, or other impermeable surfaces during dispersal and migration, as individuals are either unable to avoid being run over or desiccate before successfully passing. Species mortality may increase as a result o road widening projects, or placement o curbs at road edges. Mortality may also increase at constructed barriers within medians, and along roadways which can impede species movement; resulting in individuals being more vulnerable to vehicle and aircraft strikes, predation, and desiccation. Roads and other development, and highly cultivated areas can also indirectly affect the California tiger salamander by functioning as a partial or complete barrier to the species attempting to migrate through. Where interchange o the California tiger salamander between sites is overall beneficial to a population, the retrofitting of barriers to allow for passage (e.g., rounded curbs, ramps for curbs, etc.) and the installation of culverts, tunnels, bridges, and other crossings, specifically designed to facilitate safe wildlife passage under or across roads can minimize direct mortality from vehicle strikes, and

increase habitat connectivity and genetic exchange.

Exposure to ontaminants
The construction of buildings and roadways, repair and use of roadways, and the use of agricultural chemicals next to suitable aquatic and upland habitat for the California tiger salamander can expose the species to chemical contaminants. Substances used in road building materials or to recondition roads or for agricultural purposes can drift or wash off into nearby habitat. Vehicles may leak hazardous substances such as motor oil and antifreeze. Vehicle exhaust emissions can include hazardous substances which may concentrate in soils and in the air along roads (Trombulak and Frissell 2000), and include organic pollutants (*i.e.* dioxins, polychlorinated biphenyls) (Benfenati *et al.* 1992). A variety of substances can be introduced during accidental spills of materials.

Spills can also result from small containers falling off vehicles, or from accidents resulting in whole loads being spilled. Large spills may be partially or completely mitigated by clean-up efforts, depending on the substance. The California tiger salamander can also be exposed to contaminants through inhalation, dermal contact and absorption, direct ingestion of contaminated soil or plants, or consumption of contaminated prey. Exposure to contaminants may cause short-term affects or lead to long-term morbidity. Contaminants may also adversely affect the California tiger salamander's prey diversity and abundance, and diminish the local carrying capacity for the species. Implementation of Conservation Measures related to managing stormwater runoff, fueling, storage of hazardous materials, having a spill containment plan in place, and informing project personnel of the importance of these measures will reduce the potential for adverse effects from contaminants during project construction. However, most of these measures will not eliminate the effects of contaminants from ongoing use of roads and other infrastructure, and from agricultural practices.

Invasive Plants and Pest Management Programs
Herbicide Treatment
Herbicides will be applied per their label, and will also follow additional minimization measures developed, as noted in Solano RCD's *Final Weed Report 2015-2016* (Solano RCD 2015-2016). Changes to the Solano RCD's *Final Weed Report 2015-2016* by Travis AFB are noted in the *Conservation Measures - Herbicide pplication* section. These conservation measures were developed to avoid all effects to federally-listed species and their habitat. However, Travis AFB anticipates some instances where full avoidance is not feasible and potential activities may result in adverse effects to the California tiger salamander its habitat.

Potential adverse effects may occur for projects where mechanical treatments within 20 feet of a wetland is not effective at eliminating the non-native plant infestation, and herbicide application inside this buffer is required, while water is present in potential California tiger salamander breeding sites. Such a scenario is also likely at the Aero Club where vernal pools are so numerous; it is not feasible to completely avoid the pools. Spot, directed spray with a backpack sprayer will be used in order to minimize potential adverse effects to this species and its habitat. The use of Telar XP can have some residual soil activity/pre-emergent qualities, but the length of control depends on soil pH, rainfall after application, and rate of application (Solano RCD 2015-2016).

In areas where aquatic resources are present, only a glyphosate-based herbicide without toxic surfactants approved for use in aquatic environments will be used. To minimize potential adverse effects to this species from drift during treatments, chemicals will be applied using spot treatments with a backpack sprayer or truck mounted spray tank with hose. When applied in the summer and fall the herbicide is taken up more rapidly due to photosynthetic byproducts being transported into the root mass at a faster pace. However, applying herbicide in the spring before viable seed

maturation, and again in the fall during this intense photosynthetic process may be necessary to prevent regrowth.

Prescribed Burns

Burning of dry vernal pool habitat is expected to have an overall beneficial effect to California tiger salamander habitat. Prescribed burns may occur during the spring and early summer (April –July). On a project y project basis, prescribed burns may adversely affect the California tiger salamander and its habitat, depending on which prescribed fire practices are employed for protection of resources. Potential adverse impacts may occur from the installation of roads or fire breaks, or to define fire boundaries. Potential California tiger salamander aestivation habitat (small mammal burrows or soil cracks) within the construction footprint will likely e destroyed during installation of roads or fire breaks, as burrows are crushed or as inhabitants of burrows (including the California tiger salamander) are entombed.

Mosquito Abatement

Mosquito abatement agencies have introduced non-native western mosquitofish (*Gambusia affinis*) to wetlands on Travis AFB. Mosquitofish prey upon California tiger salamander developing embryos and larvae and can eliminate an entire cohort (Jennings and Hayes 1994). Additionally, both the California tiger salamander and mosquitofish feed on invertebrates and it is possible that large numbers of mosquitofish may out-compete the salamander larvae for food. However, in efforts to avoid adverse effects to the California tiger salamander, mosquitofish will not e added to known breeding sites for the federally-listed species.

Rodent Control

Rodent control programs can adversely affect California tiger salamander populations on Travis AFB y reducing or eliminating California ground squirrels and/or pocket gophers in or near suitable habitat for the salamander. This is especially true in areas defined as either red or yellow risk CTS areas at Travis AFB (see Appendix A of the programmatic biological assessment). The reduction or elimination of fossorial rodents can lead to eventual loss of suitable burrows that provide both aestivation habitat for the salamander and refugium for their upland prey. If suitable burrows are not available for the California tiger salamander, this species may seek suboptimal upland habitats which increases their exposure to predators, and can lead to desiccation and starvation. However, in efforts to avoid or minimize potential adverse effects to the California tiger salamander, application of pest control programs in yellow and red risk CTS areas will e avoided or reduced.

California Tiger Salamander - Habitat Compensation

Travis AFB anticipates that the majority of projects will result in temporary effects to suitable breeding and upland habitat, resulting from electrical utility system maintenance. All areas that are temporarily affected will e returned back to its preconstruction state upon completion of the proposed project. Activities most commonly producing temporary impacts are: pole replacements; vehicular access to electrical infrastructure; and underground electrical system maintenance. Permanent impacts will typically be the result of new service projects, in which a customer requires electrical service at a location not previously serviced. These activities will include the installation of new aboveground infrastructure such as utility poles and pad mounted transformers and switches. Most subsurface electrical installation (such as underground electrical conductors/conduits) projects will result in temporary effects to suitable breeding and upland habitat, as project sites will be returned to their preconstruction state upon completion.

Travis AFB will compensate for loss of California tiger salamander habitat (suitable upland habitat and aquatic breeding sites) with in-perpetuity preservation and/or restoration of habitat for the species (Table 3). Temporary loss of California tiger salamander upland habitat will be compensated at a habitat preservation ratio of 0.5:1 (area of habitat preserved to area of habitat impacted). Permanent effects to California tiger salamander upland habitat will be compensated at a habitat preservation ratio of 2:1. Direct effects to California tiger salamander breeding habitat will be compensated at a habitat preservation ratio of 3:1 and 2:1 creation (2:1 creation or 0.35 acre, whichever is greater) of California tiger salamander breeding habitat. Indirect effects to California tiger salamander breeding habitat will be compensated at a preservation or creation of 2:1.

Preservation and protection in perpetuity of high value habitat at an acquired site near the Base or by purchasing habitat at a Service-approved Conservation Bank, will allow for the permanent protection, long-term management, and enhancement of habitat for the California tiger salamander; thus, contributing to the recovery of the species. Travis AFB may coordinate with the Solano HCP process to meet habitat compensation requirements. Additionally, projects resulting in temporary effects to California tiger salamander habitat such as revegetation and restoration of project sites post-project will occur when feasible; thus, benefiting the species by improving habitat conditions. Restoration projects described in the *Description of the Proposed Action* section are expected to provide overall benefits to the California tiger salamander by restoring their destroyed or altered habitat, and by enhancing existing habitat. This compensation, combined with the implementation of additional conservation measures described in the *Conservation Measures* section above, and in Tab D of the programmatic biological assessment, are anticipated to offset the adverse effects of harm, resulting from project related habitat modification or loss.

Furthermore to avoid adverse effects to the California tiger salamander, Travis AFB will limit the amount of disturbances occurring in suitable habitat for the California tiger salamander. Specific acreage amounts for disturbance limits that will not be exceeded annually or over a 5-year period are provided below (Tab D of the programmatic biological assessment):

Permanent nd Temporary Affects to California Tiger Salamander Habitat will not exceed the following:
Permanent effects to California tiger salamander habitat:

- Total habitat disturbances to yellow and red risk CTS habitat will not exceed 1% (24 acres) annually;
- Total cumulative habitat disturbances for all projects will not exceed 3% (68 acres) over the 5-year period;

Temporary effects to California tiger salamander habitat:

- Total temporary habitat disturbances for all projects will not exceed 2% (48 acres) annually; and
- Total cumulative habitat disturbances for all projects will not exceed 5% (123 acres) over the 5-year period.

The percentages above are based on suitable California tiger salamander upland habitat mapped at Travis AFB which consists of about 2,192 acres in red risk areas, 279 acres in the yellow risk areas, and 1,096 acres in the green risk areas. Because California tiger salamanders are unlikely to utilize habitat located within the green risk areas on Travis AFB, only affected habitat located within yellow and red risk areas (2,471 total acres) will be compensated for temporary and permanent effects to suitable upland habitat. Additionally, habitat quality will be determined and documented through threatened and endangered species surveys prior to project activities.

Effects to Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp – Individuals

Travis AFB has determined that the following list of activities described below and in the *Description of the Proposed Action* section, have the potential to result in direct and indirect adverse effects to the vernal pool fairy shrimp and vernal pool tadpole shrimp, their cysts and their habitat: security and antiterrorism operations; road maintenance; runway, taxiway and ramp repair; facility maintenance and upgrade; demolition; above and under -ground utility lines; culverts and drainage ditches; fence installation, maintenance and replacement; minor construction projects; ERP site investigations and remediation methods; ERP site operations and maintenance; ERP groundwater monitoring; wetland restoration; fire suppression; and firebreak maintenance (Table 6, and Tables A-1 and B-1 of Tabs A and B respectively).

Temporary and permanent effects to these species may occur by displacement or burial, or the permanent loss of individuals and cysts through crushing by construction equipment and vehicles. Mortality or injury of individual vernal pool fairy shrimp and vernal pool tadpole shrimp is likely to occur from suitable or confirmed species habitat being altered hydrologically, by water depth, water quality, and/or water temperature. Restoration projects described in the *Description of the roposed Action* section are expected to provide overall benefits to vernal pool fairy shrimp and vernal pool tadpole shrimp by restoring their destroyed or altered habitat, and by enhancing existing habitat. This compensation, combined with the implementation of additional conservation measures described in the *Conservation Measures* section above, and in Tabs A and B of the programmatic assessment, are anticipated to offset the adverse effects of harm, resulting from project related habitat modification or loss.

Ground Disturbance and Construction/Demolition

Direct effects to vernal pool fairy shrimp and tadpole shrimp from ground disturbing activities may include damage and removal of suitable vernal pool habitat and other aquatic features, killing individuals and cysts of these species. Indirect effects to these species from ground disturbance in or near occupied habitat may result from alteration of surface hydrology that affects the hydro-period of pools and swales; leading to the eventual loss of suitable habitat and species occurrences. However, with most proposed projects, implementation of proper species-specific conservation measures will avoid or minimize habitat alteration and destruction, and/or the loss of vernal pool fairy shrimp and vernal pool tadpole shrimp and cysts.

Exposure to Contaminants

The construction of buildings and roadways, as well as the repair and use of roadways, and the use of agricultural chemicals next to vernal pools and other suitable wetlands can expose vernal pool fairy shrimp and tadpole shrimp to chemical contaminants. Substances used in road, building materials, and to recondition roads, or for agricultural purposes, can drift or wash off into nearby habitat. Vehicles may leak hazardous substances such as motor oil and antifreeze. See the above section *Effects to California Tiger lamander - Exposure to Contaminants* for details regarding additional sources of potential contaminants which may also lead to potential affects to vernal pool fairy shrimp and vernal pool tadpole shrimp. Species-specific conservation measures and general measures will be implemented to avoid or minimize potential adverse effects to both of these species including: having a spill containment plan in place; stormwater runoff management plan; and a plan for fueling and storage of hazardous materials. However, most of these measures will not completely eliminate the potential adverse effects of contaminants from ongoing use of roads and other infrastructure, and from agricultural practices.

Invasive lant Species Management

Herbicide Application

Travis AFB anticipates that any proposed projects that occur within 250 feet of known or potentially suitable habitat for these vernal pool crustaceans will implement the measures described in the *Conservation Measures* section, and species-specific measures in Tabs A and B to avoid or minimize disturbances and adverse effects to these vernal pool species (unless otherwise noted in the project effects analysis that will be sent to the Service prior to project implementation).

Adverse effects to vernal pool fairy shrimp and tadpole shrimp or their habitat may occur in instances where herbicides treatment within the 250 foot buffer is necessary for larger weed infestations, or where vernal pools are located close together. Any herbicide sprayed within the buffer, will only contain herbicides without toxic surfactants, approved for use in aquatic environments. Such a scenario is likely at the Aero Club where vernal pools are so numerous; it is not feasible to completely avoid the pools. Spot, directed spray with a backpack sprayer will be used to avoid or minimize potential effects to these vernal pool crustaceans. Because of the difficulty in quantifying take of individual vernal pool fairy shrimp and vernal pool tadpole shrimp, effects to these species are determined by the area of impact to suitable or occupied habitat.

Effects to Vernal Pool Fairy Shrimp nd Vernal Pool Tadpole Shrimp - Habitat

The proposed activities also have the potential to result in temporary and permanent affects to vernal pool fairy shrimp and vernal pool tadpole shrimp through the destruction or removal of their habitat. Where feasible, both occupied and suitable habitat for these vernal pool crustaceans will be avoided; although, unforeseen situations may exist that prevent complete avoidance (i.e., emergency repairs to overhead or underground utilities).

Ground Disturbing Activities

Due to the relatively flat topography on most of Travis AFB, many vernal pools and other suitable wetland features are hydrologically connected; therefore, the aquatic habitat may be affected if trenching, boring, or significant ground disturbance or paving with impermeable surfaces occurs in areas between the aquatic features. These types of activities within a hydrologically connected area may alter the hydrologic flow of the pools, diminishing their ability to function adequately. Vernal pool fairy shrimp, vernal pool tadpole shrimp, and their cysts may be subject to injury or mortality by activities such as grading, excavation, disking, trenching, or other types of direct ground disturbance. Vernal pool fairy shrimp and vernal pool tadpole shrimp habitat may be subject to disturbance as a result of proposed projects, and by vehicle and equipment access to their associated project sites.

Ground disturbing activities in the watershed of vernal pools is expected to result in siltation when pools fill during the wet-season following construction. Construction activities may result in increased sedimentation transport into the habitat for these vernal pool crustaceans during periods of heavy rains. Siltation in pools supporting vernal pool fairy shrimp and vernal pool tadpole shrimp may result in decreased cyst viability, decreased hatching success, and decreased survivorship among early life history stages; thereby, reducing the number of mature adults in future wet-seasons.

The hydrologic regime (e.g., change in rates of surface flow) of vernal pools may be altered due to disturbance of the claypan layer or changing the slope or groundcover of the surrounding landscape. The biota of vernal pools and aquatic swales can change when the hydrologic regime is altered. Survival of aquatic organisms such as vernal pool fairy shrimp and vernal pool tadpole shrimp are directly linked to the water regime of their habitat (Zedler 1987). Therefore, construction near vernal pool areas is likely to result in the decline of local sub-populations of vernal pool organisms,

including vernal pool fairy shrimp and vernal pool tadpole shrimp. These activities can affect the amount and quality of water available to vernal pools and the surrounding areas which drain into the pools. Grading for roads may affect the water regime of vernal pool habitat, particularly when grading involves cutting into the substrata in or near these areas. Exposure of sub-surface layers of soil at road cuts may accelerate the loss of water from adjacent habitat by mass flow through networks of cracks, lenses of coarser material, animal burrows, or other macroscopic channels.

Many temporary wetlands on Travis AFB are manmade and are typically the result of water ponding next to a runway, taxiway, road or railroad in a toe drain. Many roadside localities in the cantonment area are occupied by vernal pool fairy shrimp and vernal pool tadpole shrimp; therefore when feasible, temporary wetland habitats that occur along roadways will be avoided during all aspects of proposed projects, reducing potential adverse effects to vernal pool fairy shrimp and vernal pool tadpole shrimp and their habitat. Access to sites for maintenance projects that are within seasonal wetland habitats will only occur during the dry season in order to minimize or avoid potential impacts to vernal pool fairy shrimp and vernal pool tadpole shrimp and their habitat. Where feasible, all equipment will be staged outside of the immediate vicinity of wetlands and will perform all project activities manually. When this is not feasible and it is necessary to encroach within the perimeter of any vernal pool, it will be accomplished by accessing existing non-sensitive habitat, and using boards or plates placed over the pool to distribute the weight of the equipment in order to reduce or avoid potential adverse effects.

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp - Habitat Compensation
Travis AFB will compensate for both direct and indirect adverse effects to suitable vernal pool fairy shrimp and tadpole shrimp habitat with in-perpetuity preservation of existing habitat for these species (See Table 3). Specifically, direct effects to high value vernal pool conservation habitat will be compensated at a 7:1 preservation ratio (area of vernal pool habitat preserved to area of vernal pool habitat effected); medium value vernal pool conservation habitat will be compensated at a :1 preservation ratio; and low value vernal pool conservation habitat will be compensated at a 1:1 preservation ratio. Alternatively within high and medium value vernal pool conservation areas, compensation may also be met by purchasing credits at a 6:1 or 2:1 preservation ratio with 1:1 ratio creation, respectively. Indirect effects to suitable vernal pool fairy shrimp and vernal pool tadpole shrimp habitat will be compensated at a 1:1 preservation ratio.

The purchase of habitat at a Service-approved Conservation Bank or the preservation and protection in perpetuity of high value vernal pool habitat near the Base will allow for the permanent protection, long-term management, and enhancement of the habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp; thus, contributing to the recovery of these species. Additionally, Travis AFB may coordinate with the Solano HCP to meet compensation requirements. The conservation and compensation measures described above are anticipated to help offset adverse effects of harm resulting from project-related habitat modification or loss. Additionally, restoration projects will be implemented as described in the *Description of the Proposed Action* section, are expected to benefit vernal pool fairy shrimp and vernal pool tadpole shrimp in the long-term by restoring their destroyed or altered habitat, and by enhancing existing habitat.

Because vernal pool fairy shrimp have been found occurring in numerous locations on the Base, and much of the seasonal wetland habitat on the Base and at the GSUs provide suitable habitat for this species; Travis AFB has agreed to the following annual and cumulative disturbance limits to vernal pool fairy shrimp habitat (Tab A of the programmatic biological assessment):

Permanent nd Temporary Affects to Vernal Pool dpole hrimp Habita t will not exceed the following:
Direct affects to occupied habitat:

- Total habitat disturbances for all projects will not exceed 1% (0.08 acre) annually;
- Total cumulative habitat disturbances for all projects will not exceed 3% (0.27 acre) over the 5-year period;

Indirect affects to occupied habitat:

- Total habitat disturbances to hydrologically connected systems will not exceed 5% (0.44 acre) annually;
- Total cumulative habitat disturbances for all projects will not exceed 15% (1.33 acres) over the 5-year period.

Direct affects to potentially occupied habitat:

- Total habitat disturbances for all projects will not exceed 2% (1.6 acres) annually;
- Total cumulative habitat disturbances for all projects will not exceed 3% (2.4 acres) over the 5-year period;

Indirect affects to potentially occupied habitat:

- Total habitat disturbances for all projects will not exceed 5% (4.0 acres) annually;
- Total cumulative habitat disturbances for all projects will not exceed 10% (8.0 acres) over the 5-year period;

Permanent loss of occupied habitat:

- Total permanent loss of habitat will not exceed 0.5% (0.029 acre) annually; and
- Total cumulative permanent loss of habitat will not exceed 1.5% (0.06 acre) over the 5-year period.

The percentages provided above for limits in disturbances to vernal pool fairy shrimp habitat is based on a total of 8.9 acres of occupied vernal pool fairy shrimp habitat, and a total of 80 acres of potentially occupied habitat for the species. This area excludes the GSUs since a wetland delineation and species surveys have not yet been completed for those locations. Therefore, habitat and its quality will be determined and documented through existing and future threatened and endangered species surveys.

Vernal pool tadpole shrimp have not been found to occur on the main Base of Travis AFB despite numerous species focused surveys; therefore, annual and cumulative disturbance limits to vernal pool tadpole shrimp habitat have not been developed.

Effects to Contra Costa Goldfields

Travis AFB has determined that the following list of activities described below and in the *Description of the Proposed Action* section, have the potential to result in direct and indirect adverse effects to Contra Costa goldfields and their habitat: security and antiterrorism operations; road maintenance; runway, taxiway and ramp repair; facility maintenance and upgrade; demolition; above and under ground utility lines; culverts and drainage ditches; fence installation, maintenance and replacement; minor construction projects; ERP site investigations and remediation methods; ERP site operations and maintenance; ERP groundwater monitoring; invasive species removal; wetland restoration; and fire suppression (Table 6, and Table E-1 and E-1 of Tab E).

Ground Disturbance and Construction/ Demolition

Direct effects to Contra Costa goldfields from ground disturbing activities and construction equipment may include damage, burial or displacement, and removal of individual plants and seeds; therefore, potentially leading to permanent loss. Indirect effects to the plant and its seeds from ground disturbance in or near occupied habitat may result in permanent loss of soil structure, soil

water-holding capacity, or loss of microhabitat features (Rains *et l.* 2008). Ground disturbance in occupied habitat may also fragment occurrences, which can lead to isolated individual plants and affect genetic variability within plant populations. Other indirect effects include alteration of surface hydrology that affects the hydro-period of pools and swales which may reduce germination and growth or promote the establishment of non-native invasive plant species. Contra Costa goldfield populations are likely to be adversely affected within vernal pools that are altered hydrologically by water depth, water quality, and or water temperature. The hydrologic regime (e.g., change in rates of surface flow) of the pools may be altered due to disturbance of the claypan layer or changing the slope or groundcover of the surrounding landscape. Therefore, construction within 250 feet of vernal pools occupied with Contra Costa goldfields is likely to result in the decline of local sub-populations of the plant.

Activities such as deep drilling, grading, excavation, disking, trenching, installation of equipment under ground, or other types of direct ground disturbance that perforate the claypan either within a pool basin or adjacent to a pool may cause the area to drain at a faster rate; therefore adversely affecting the hydrology of a pool. Due to the relatively flat topography on most of Travis AFB, many pools are hydrologically connected; thus, may be affected if ground disturbances occur in areas between pools. Construction activities within 250 feet of Contra Costa goldfields habitat may result in increased sedimentation transport into the plants habitat during periods of heavy rains. Siltation in pools supporting this species may result in decreased seed viability, decreased germination success, and decreased survivorship; thereby, reducing the number of flowering plants in future wet seasons.

All projects that occur within 250 feet of known or potential Contra Costa goldfields habitat, will implement the conservation measures to avoid or minimize disturbances and adverse effects to the species and its habitat when feasible. Furthermore, implementing proper conservation measures and species-specific conservation measures will avoid, or minimize, habitat alteration and destruction and loss of individual plants and their seeds. See the *Conservation Measures* section and species-specific measures listed in Tab E of the programmatic biological assessment.

Vernal Pool and Seasonal Wetland Restoration

Restoration projects described in the *Description of the Proposed Action* section may result in temporary adverse effects to Contra Costa goldfields and their habitat. Contra Costa goldfields may be subject to loss or injury of plants and its seeds by activities such as grading, excavation, disking, trenching, or other types of direct ground disturbances. To avoid or minimize potential adverse effects to Contra Costa goldfields and its habitat prior to grading within wetlands, the top 4-6 inches of topsoil will be removed from the surface and stored separately from all other spoil piles, including non-wetland topsoil, in order to maintain integrity of the soil composition and character. Wetland topsoil will be replaced in the same wetland it was taken from following backfill and grading. Generally, monitoring of wetland areas for the success of restorative efforts will occur for a minimum of 2 years. See section 4.4.6 of the programmatic biological assessment for further details on restoration activities. In general, restoration projects conducted at Travis AFB are expected to have overall long-term benefits to Contra Costa goldfields by restoring its destroyed or altered habitat, and by enhancing existing habitat.

In addition, while most of the ERP sites on Travis AFB have been treated and closed, some sites may require further action and operations and maintenance. See the *Description of the Proposed Action* section for specific activities, including ground disturbing activities which may adversely affect Contra Costa goldfields and its habitat.

Fire Suppression
Roads used to access remote portions of the Base as part of wildfire suppression and fuels management activities are maintained once a year, after the rainy season. As a result of wildfire suppression and fuels management activities, Contra Costa goldfields plants and seeds may be adversely affected by injury or mortality caused by grading, excavation, disking, or other types of direct ground disturbances. When feasible, implementing proper conservation measures and species-specific conservation measures will avoid, or minimize, habitat alteration and destruction and loss of individual plants and their seeds. See the *Conservation Measures* section and species-specific measures listed in Tab E of the programmatic biological assessment.

Herbicide Application
Travis AFB anticipates that any proposed projects that occur within 250 feet of known or potentially suitable habitat for Contra Costa goldfields will implement the measures described in the *Conservation Measures* section, and will follow additional species-specific measures in Tab E to avoid or minimize potential adverse effects to the species and it habitat (unless otherwise noted in the project effects analysis that will be sent to the Service prior to project implementation).

In most instances full avoidance of Contra Costa goldfields and its habitat will occur by designating 250 foot no access buffers; however, there may be some instances where affects to this species are unavoidable. Adverse effects to Contra Costa goldfields and its habitat may occur in instances where herbicides treatment within the 250 foot buffer is necessary for larger weed infestations, or where vernal pools are located close together. Any herbicide sprayed within the buffer will only contain herbicides without toxic surfactants, and be approved for use in aquatic environments. Such a scenario is likely at the Aero Club where vernal pools are so numerous; it is not feasible to completely avoid the pools. Spot, directed spray with a backpack sprayer will be used within the buffer in order to avoid or minimize potential effects to Contra Costa goldfields plants and its seeds or habitat.

One instance where full avoidance of this species and its habitat is likely not possible is a pilot study using Telar being planned to occur at Travis AFB. The pilot study will be conducted on pepperweed infested pools at the Aero Club that contain the related common *Lasthenia* plant species. Before and after vegetation data will be collected to determine whether adverse effects to the common species were avoided. If data shows that the related species was adversely affected, Travis AFB will request a Level 3 LAA consultation with appropriate conservation measures.

Because of the difficulty in quantifying take of individual Contra Costa goldfields, effects to this species is determined by the area of effect to suitable habitat. Because of the observed limited distribution of Contra Costa goldfields at Travis AFB, not all vernal pool habitats on the Base are considered suitable for the species. Current populations and vernal pools that have been documented to provide suitable habitat for the Contra Costa goldfields in the past are considered occupied habitat for this species (based on the presumption that the long-lived soil seedbank is still viable).

Effects to Contra Costa Goldfield - Habitat
The proposed activities have the potential to result in short-term temporary affects and permanent removal of Contra Costa goldfields habitat. Where feasible, both occupied and suitable habitat for this species will be avoided; although, unforeseen situations may exist that prevent complete avoidance (i.e., emergency repairs to overhead or underground utilities).

Contra Costa Goldfields - Habitat Compensation

Travis AFB will compensate for direct and indirect effects to Contra Costa goldfields habitat with in-perpetuity preservation and/or restoration of suitable habitat for this species (Table 3). Specifically, direct effects to Contra Costa goldfields habitat will be compensated at a 7:1 ratio through preservation of existing habitat, and will also compensate at a 2:1 creation ratio, establishing self-reproducing populations of Contra Costa goldfields in protected areas. Indirect effects to Contra Costa goldfields habitat will be compensated at a 1:1 ratio through preservation of existing habitat for this species.

The purchase of Contra Costa goldfields habitat at a Service-approved Conservation Bank or the preservation and creation, and protection in perpetuity of high value vernal pool habitat near the Base will allow for the permanent protection, long-term management, and enhancement of habitat for the recovery of the species. Additionally, Travis AFB may coordináte with the Solano HCP process to meet compensation requirements. The conservation and compensation measures described above are anticipated to help offset the adverse effects of harm resulting from project-related habitat modification or loss. Additionally, restoration projects proposed by Travis AFB are expected to benefit Contra Costa goldfields in the long-term by restoring its destroyed or altered habitat, and by enhancing existing habitat.

Furthermore, Travis AFB has agreed to the following disturbance limits to Contra Costa goldfields and its habitat (Tab E of the programmatic biological assessment):

Permanent and Temporary Affects o Contra Costa goldfield habitat will not exceed the following over the next 5 years:

Direct affects to occupied habitat:

- Total habitat disturbances for all projects will not exceed 0.5% (0.14 acre) annually;
- Total cumulative habitat disturbances for all projects will not exceed 1% (0.28 acre) over the 5-year period;

Indirect affects to occupied habitat:

- Total habitat disturbances to hydrologically connected systems will not exceed 5% (1.4 acres) annually;
- Total cumulative habitat disturbances for all projects will not exceed 10% (2.8 acres) over the 5-year period;

Permanent loss of occupied habitat:

- Total irretrievable loss of documented habitat will not exceed 0.25% (0.07 acre) annually; and
- Total cumulative irretrievable loss of documented habitat will not exceed 0.5% (0.14 acre) over a 5-year period.

The percentages above are based on a total of about 28 acres of species occupied vernal pool habitat including previously documented Contra Costa goldfields occurrences; which assumes that this species seedbank is still viable. Existing habitat and its quality will be determined and documented through present and future threatened and endangered species surveys.

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 are considered in this programmatic biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section; they require separate consultation pursuant to section 7 of the Act.

Numerous non-federal activities continue to adversely affect vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, and Contra Costa goldfields in the action area, primarily through the damage or destruction of habitat for these species. In addition, the same activities that affect these federally-listed species also affect critical habitat for vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, and Contra Costa goldfields. Loss and degradation of habitat affecting these species with or without Service authorization continues as a result of urbanization; road construction and maintenance; utility right-of-way management; flood control projects that may not be funded, permitted, or constructed by a federal agency; and continuing conversion of rangelands to more intensive agricultural crops. Additionally, the California tiger salamander is also adversely affected by ground squirrel reduction, mosquito control, including the planting of non-native mosquito fish, and road-related mortality. However, much of the land surrounding Travis AFB is protected through deed restrictions or conservation easements, reducing some of these potential adverse effects. The portion of the Wilcox Ranch adjacent to the Base is owned by the City of Fairfield and Solano County, and is subject to deed restrictions that prohibit most kinds of development.

Access to sites within vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander and Contra Costa goldfields habitat for proposed projects will continue to occur in the future, therefore continued short-term temporary disturbance to the affected vernal pools and other suitable wetland habitat will occur. However, proposed projects at these sites are relatively rare, and every attempt will be made to minimize and avoid disturbances to these species and their habitat.

Conclusion

Federally-Listed Species
After reviewing the current status of the vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, and Contra Costa goldfields, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that proposed projects which meet the qualifications for this programmatic biological opinion are not likely to jeopardize the continued existence of these species. Although critical habitat for these species will be affected, none will be destroyed or adversely modified by the projects that meet the qualifications of the programmatic biological opinion. This determination is based on the description of the proposed action that provides numerous measures and additional minimization measures that will be implemented to minimize adverse effects of future proposed projects on federally-listed species and their critical habitat. Implementing these conservation measures, including the standard habitat compensation ratios, ensures more occupied habitat will be conserved than affected. As a result, project-related effects to vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, and Contra Costa goldfields, and their habitat will not rise to the level of precluding recovery of these species or reducing the likelihood of their survival.

Critical Habitat
After reviewing the current status of designated critical habitat for vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, and Contra Costa goldfields; the environmental baseline for the action area; the effects of the proposed projects over the next 5-years at Travis AFB and its GSUs; and the cumulative effects, it is the Service's biological opinion that the Proposed Effects of Activities Conducted at Travis Air Force Base on Six Federally Threatened and Endangered Species, as proposed, is not likely to destroy or adversely modify designated critical habitat for these species. The Service reached this conclusion because proposed project-related effects to designated critical habitat, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding the function

of these four federally-listed species' designated critical habitat to serve its intended conservation role for these species based on the following. The effects to critical habitat are small and discrete, relative to the entire area designated as critical habitat, and are not expected to appreciably diminish the value of the critical habitat or prevent it from sustaining its role in the conservation of vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, and Contra Costa goldfields.

PROGRAMMATIC INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by Travis AFB so that they become binding conditions of any grant, contract, or permit issued by Travis AFB as appropriate, in order for the exemption in section 7(o)(2) to apply. Travis AFB has a continuing duty to regulate the activity covered by this Incidental Take Statement. If Travis AFB: (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit, contract, or grant document; and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, Travis AFB must report the progress of the action and its impact on the California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields to the Service as specified in the incidental take statement (SO CFR §402.14(i)(3)).

Amount or Extent f Take

The specific amount or extent of incidental take of the California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields unquantifiable at this time because this consultation has analyzed multiple proposed actions at a programmatic level. Travis AFB will submit individual projects to the Service for specific review and analysis by the Service. If appropriate, incidental take will be authorized upon appendage of the specific project to this programmatic biological opinion. o exemption from section 9 of the Act is granted in this programmatic biological opinion.

Effect f the Take

No incidental take is authorized by this programmatic biological opinion for the California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields.

Reasonable and Prudent Measures

All necessary and appropriate measures to avoid or minimize effects on the Californi tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields, resulting from project implementation has been incorporated into this programmatic framework. Therefore, the Service believes the following reasonable and prudent measure is necessary and appropriate to minimize incidental take of the California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields:

1. All conservation measures, s described in the programmatic biological assessment and restated here in the *Description of the Proposed Action* section of this programmatic biological opinion, shall be fully implemented and adhered to. Further, this reasonable and prudent measure shall be supplemented by the terms and conditions below.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, Travis AFB must ensure compliance with the following term and condition, which implement the reasonable and prudent measure described above. This term and condition is nondiscretionary.

1. Travis AFB shall include full implementation and adherence to the conservation measures proposed in the programmatic biological assessment and restated in this programmatic biological opinion as a condition of any permit issued for the proposed project.

CONSERVATION ECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by c rrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on federally-listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends the following actions:

Travis AFB should continue to work with the Service to assist us in meeting the goals for: 1) the vernal pool fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields as outlined in the *ecovery Plan for Vernal ool Ecosystems for Vernal ool cosystems of California and outhern regon* (Service 005); and) the California tiger salamander s outlined in the *ecovery Plan for the Central California Distinct opulation egment of the California Tiger Salamander (Ambystoma californiense)*, signed June 06, 017 (Service 017).

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.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the actions described in this programmatic biological opinion for the Proposed Effects of Activities Conducted at Travis Air Force Base on Six Federally Threatened and Endangered Species. As provided in 0 CFR §402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if:

(a) If the amount or extent of taking specified in the incidental take statement is exceeded;
(b) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;
(c) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the programmatic biological opinion; or
(d) If a new species is listed or critical habitat designated that may be affected by the identified action.

If you have any questions regarding this programmatic biological opinion, please contact Harry Kahler, Biologist (Harry_Kahler@fws.gov) at (916) 414-6577 or Doug Weinrich, Assistant Field Supervisor (Douglas_Weinrich@fws.gov) at (916) 414-6563.

Sincerely,

Jennifer M. Norris, Ph.D.
Field Supervisor

Enclosure

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Enclosure

(Figures 1 – 8; Tables 1, 2 & 6; & Project Effects Analysis Report Template were provided by Travis AFB in their Programmatic iological Assessment, March 2018)

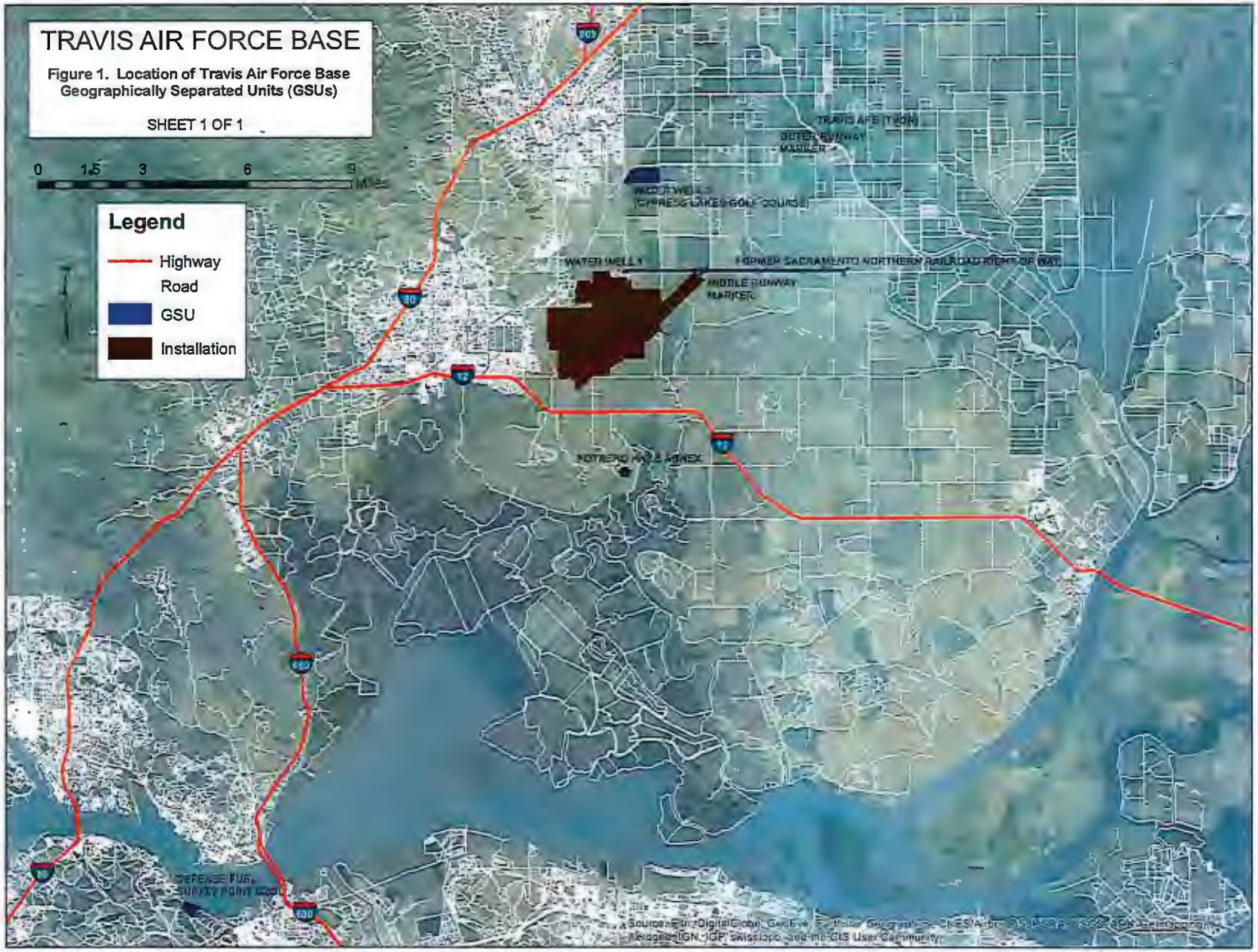
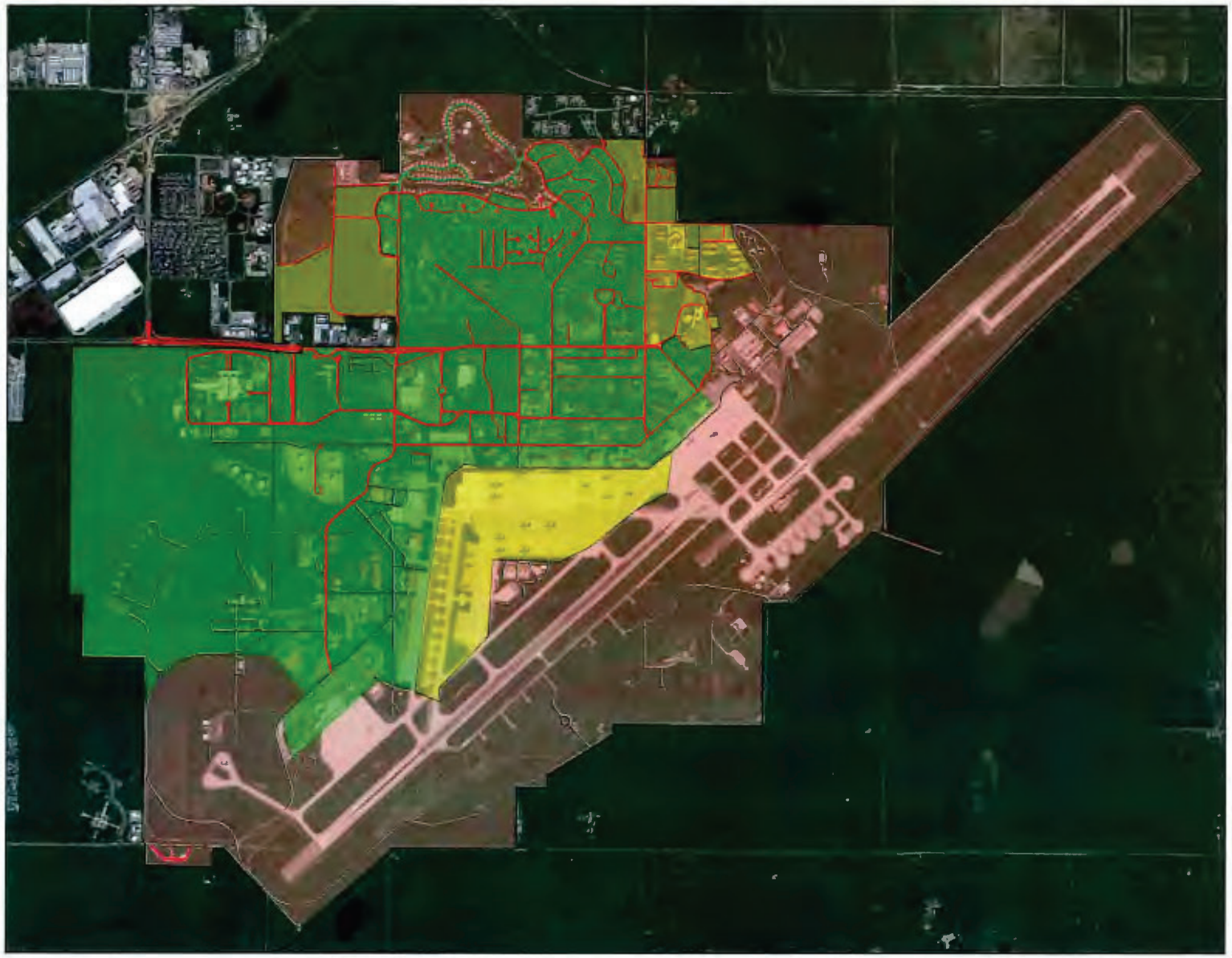


Figure 1. General location of Travis AFB and GS s.



Document Path: \\vmware-host\Shared Folders\Desktop\GIS\TAFB\PBA figures\PBA Figure 2 CTS Risk.mxd

Programmatic Biological Assessment
Travis AFB, CA

Figure 2
CTS Risk Areas

Legend

Roads and Curbs

- No curb
- Round
- Square

CTS Risk Areas

- High Risk (2546 acres)
- Medium Risk (507 acres)
- Low Risk (1955 acres)

N

0 0.15 0.3 0.6 0.9 1.2
ilometers

Credits: ESRI 2017; AFB 2018
risk mapping based on habitat resistance modeling conducted s part of TAFB PBA

Programmatic Biological Assessment
Travis AFB, CA

Figure 3
Vernal Pool Conservation Areas

Travis AFB Boundary and GSUs

2018_wetlands

VP Conservation Areas

High value (729 acres)

Medium value (920 acres)

Low value (1559 acres)

N

0 0.2 0.4 0.8 1.2 1.6
Kilometers

Credits: DA 2016; AFB 2017
habitat value mapping based on Solano Co. HCP
mapping conducted as part of TAFB BA

Document Path: \\vmware-host\Shared Folders\Desktop\GIS\TAFB\PBA figures\PBA Figure vp cons area1.mxd

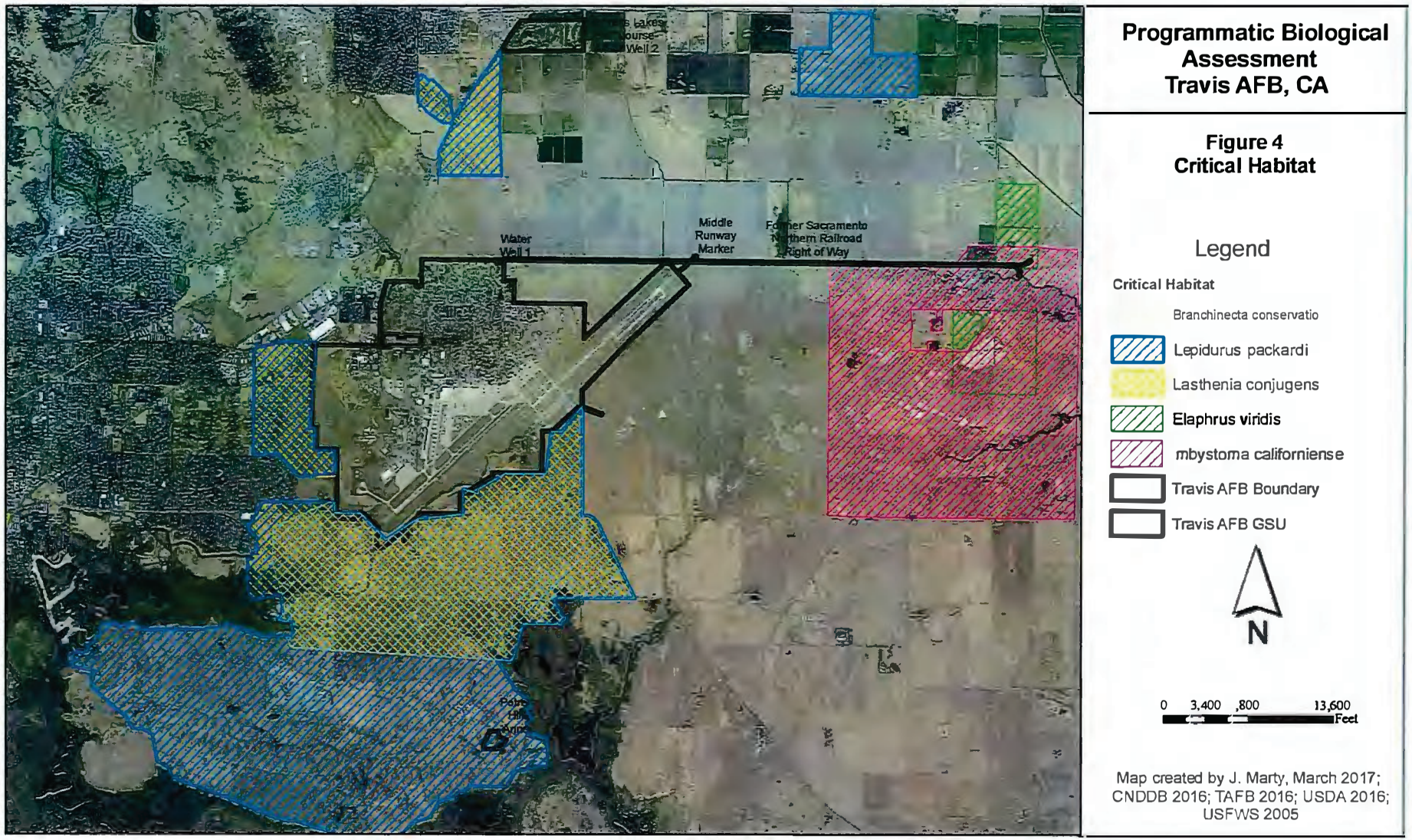


Figure 4. Critical Habitat.

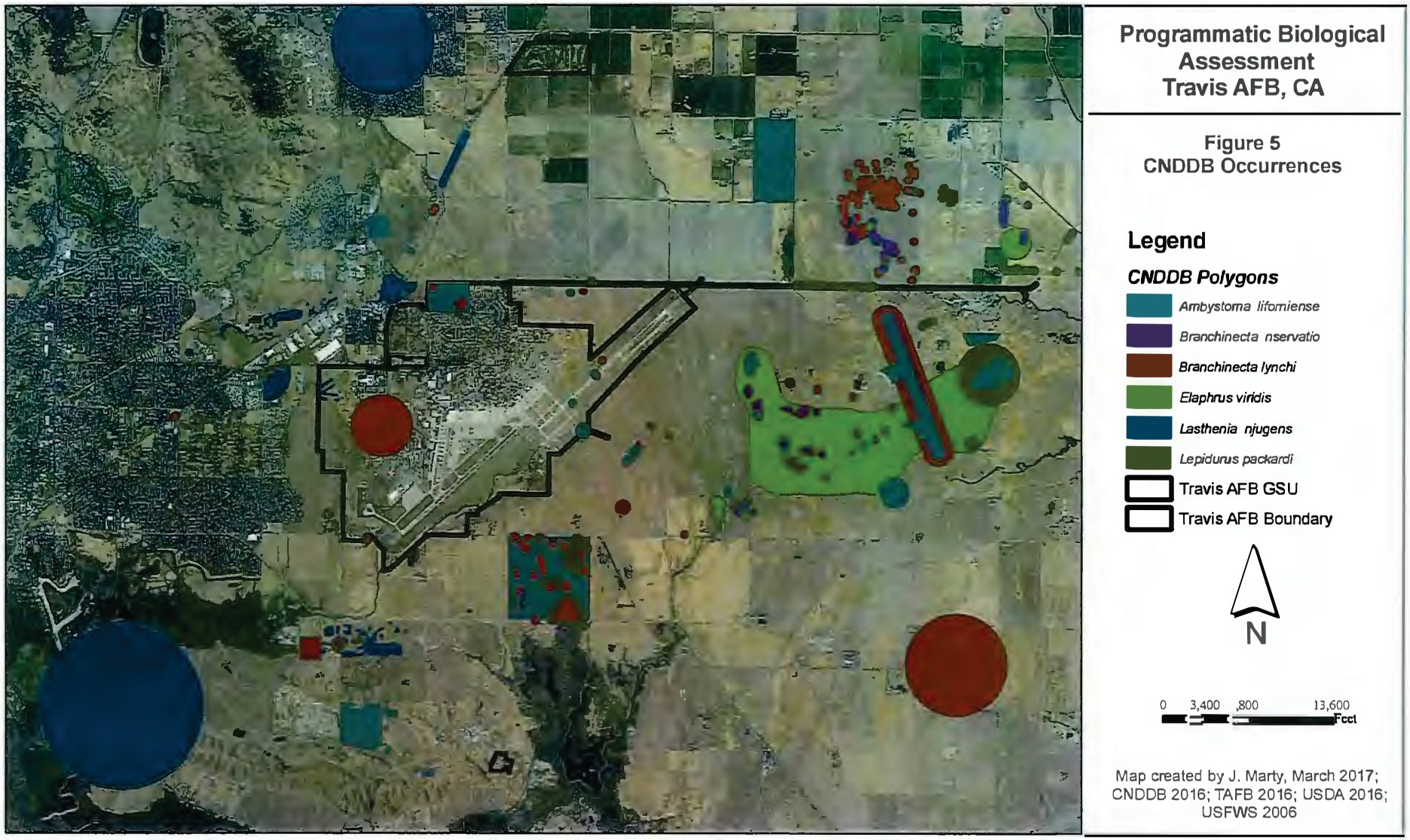


Figure 5. CNDDB urrences.

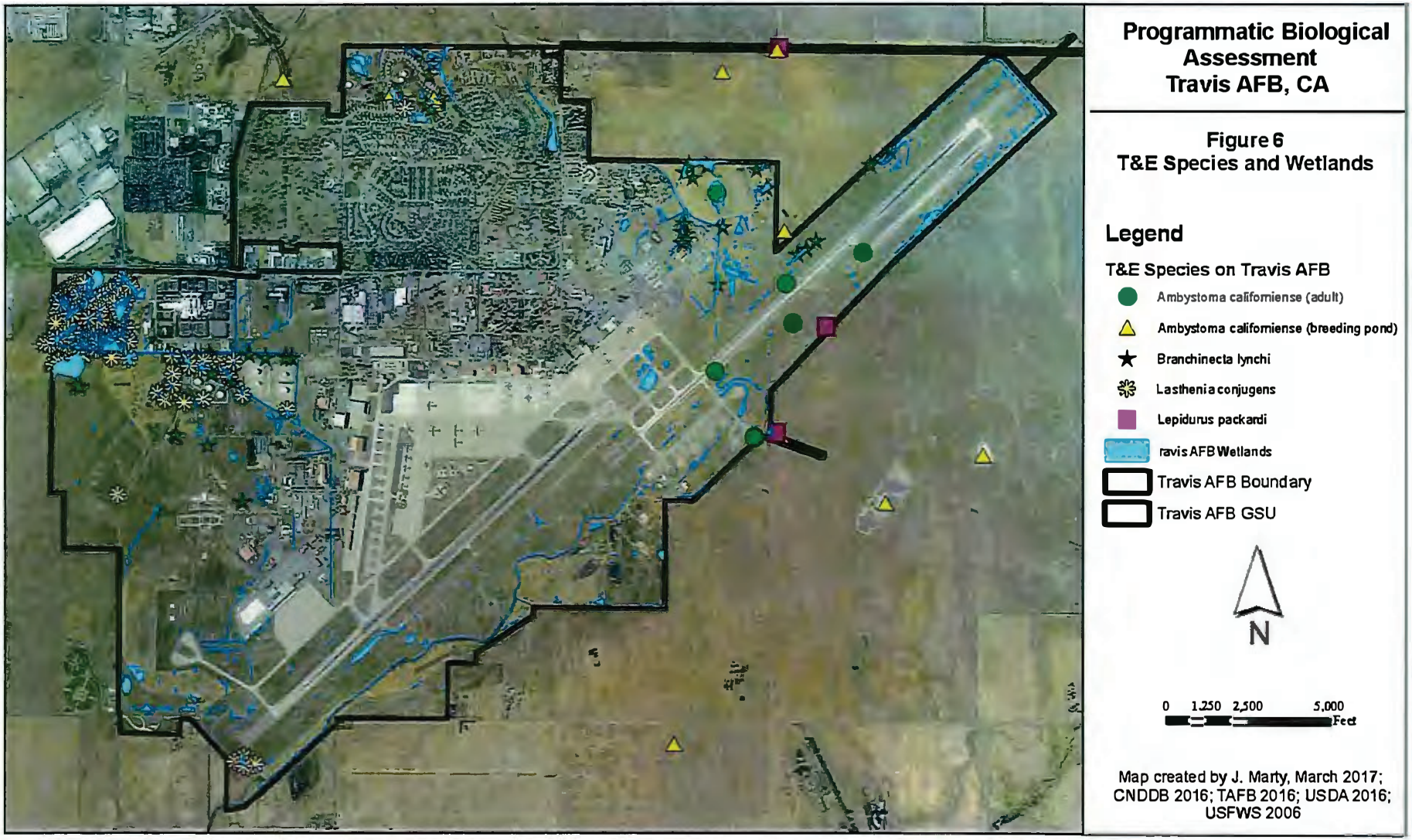


Figure 6. n-Site pecies ccurrences.

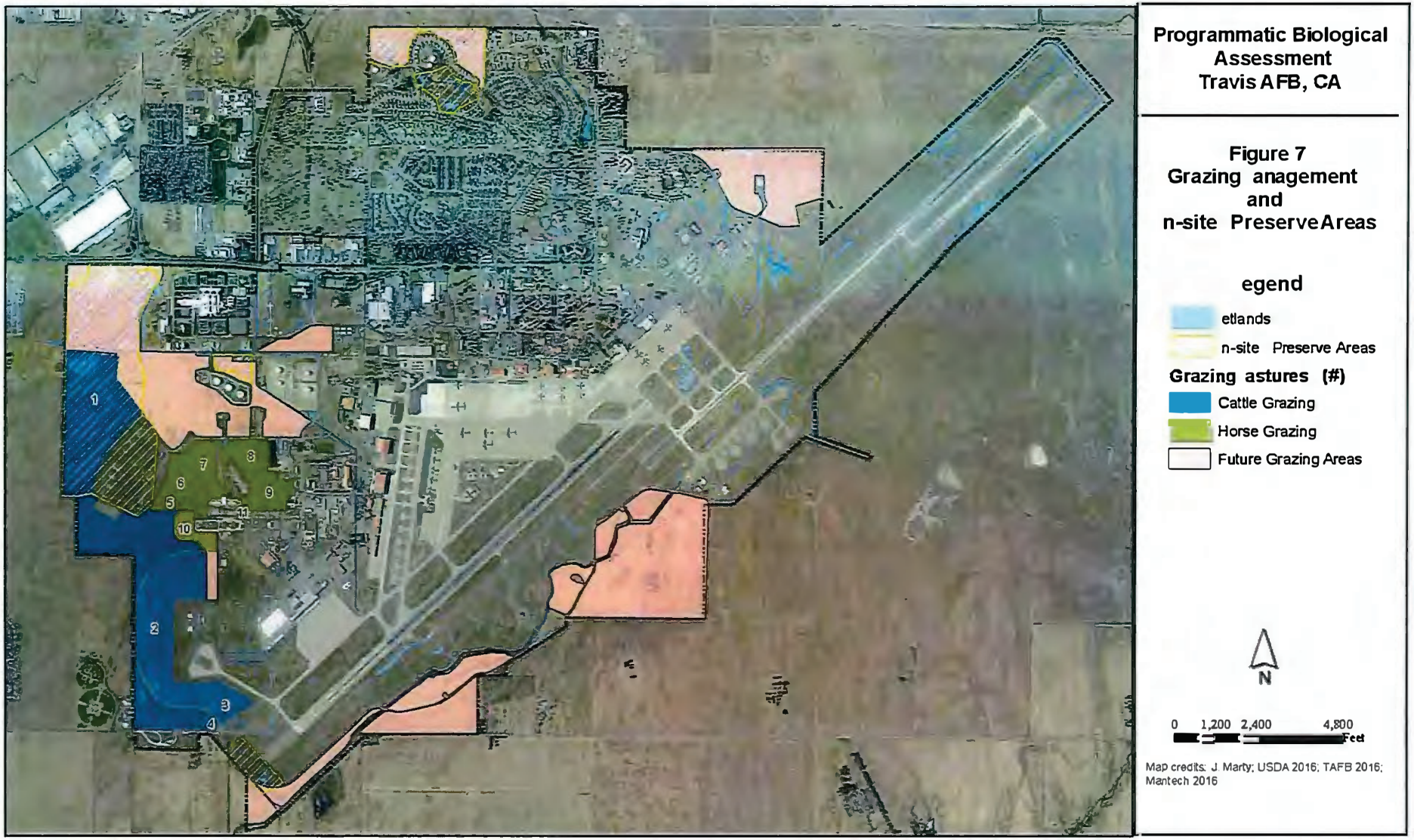


Figure 7. Grazing nagement nd reserves.

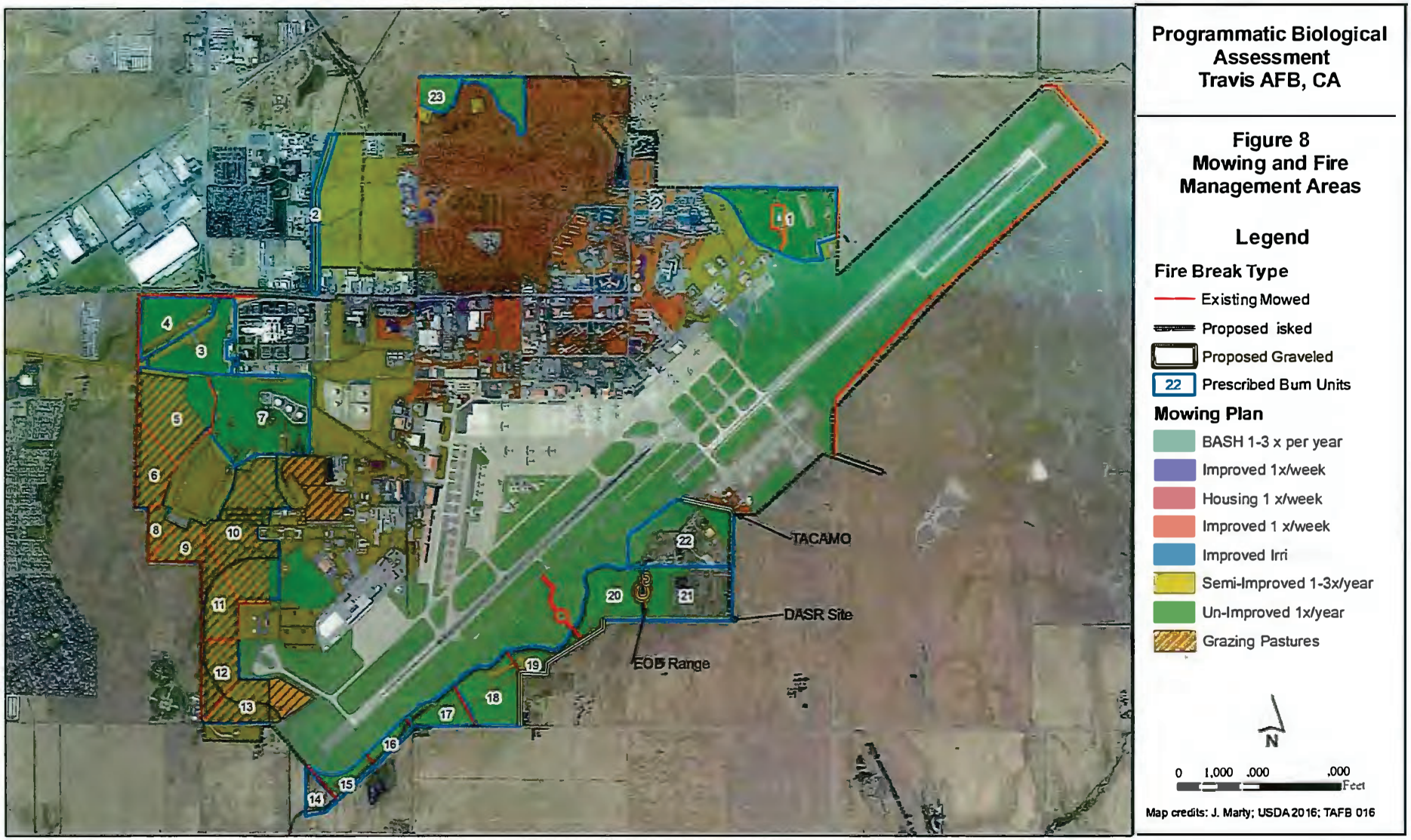


Figure 8. Fire Management and Mowing.

Table 1 Proposed Thresholds for Levels of Consultation for VPFS, VPTS, CFS, and CCG, and selected areas of the base for DGGB. See Figure C-1.

(*upland habitat is defined as land cover value 1; Appendix A)

riteria	evel 1	evel 2	Level 3
	N ffect	Not Likely to Adversely Affect	May Adversely Affect
Proximity to Resources	• Work on paved/gravel surfaces; and/or • Work within paved/gravel road shoulders; and/or • Work > 250 feet from wetland	Work outside wetlands but within 250 feet of wetlands that meet the following criteria: • wetland is higher in elevation than the work site or, • wetland area is upstream of the project or, • a physical barrier to hydrological connectivity is present or, • shallow excavation; or • other reasons why wetlands are not impacted	Projects that will affect wetlands (directly or indirectly)
Submittal to USFWS	No submittal	• Project Analysis (template in Appendix B) sent >30 days prior to project start with two-week FWS response period • When project impacts are >100 ft from all wetlands then documents kept by base; submit in annual report	A Project Analysis including project description with maps following template in Appendix B.
Avoidance & Minimization Measures	All equipment and excess soil must stay on paved/gravel surfaces	• General Minimization Measures • Species-Specific Avoidance Measures • No habitat compensation required	• General Minimization Measures • Species-Specific Avoidance Measures • Habitat compensation and/or monitoring required

Table 2. Proposed Thresholds for Levels of Consultation for CTS (*upland habitat is defined as land cover value 1; Appendix A)

Criteria	Level 1a No Effect	Level 1b No Effect (With Conservation Measures)	Level 2 Not Likely to Adversely Affect	Level 3 May Adversely Affect
Project Impact on Resources	• Work limited to paved/gravel surfaces and shoulders; and • Work between 1 May and 15 Oct	• Work limited to paved/gravel surfaces and shoulders in Low Risk areas from 16 Oct to 31 Apr; and/or • Work limited to paved/gravel surfaces and shoulders in Medium Risk areas; and/or • *Temporary and ermanent* disturbance of upland habitat* in Low risk areas	• Temporary disturbance of upland habitat* in Medium Risk areas; and/or • Work limited to paved/gravel surfaces and shoulders in High Risk areas (with appropriate CMs)	• Permanent disturbance of upland habitat in Medium and High Risk areas; and/or • Temporary ground disturbance of upland habitat* within High Risk Areas
Submittal to USFWS	No submittal	No submittal	• Project analysis (template in Appendix B) sent >30 days prior to project start with two-week FWS response period; and/or • When upland disturbance ≤1/4 acre in Medium Risk area then documents kept by base; submit in annual report	Project analysis following template in Appendix B.
Location	Low Risk	Low Risk (Some Medium)	Medium Risk (Some High)	Some Medium, all High Risk
Avoidance & Minimization Measures	All equipment and excess soil must stay on paved/gravel surfaces	• CTS awareness training by Service-approved Biologist for all crew members; and • All equipment/vehicles stay on paved surfaces from 16 Oct to 31 Apr; and • All open trenches >6" covered or escape ramp placed in trench/hole at end of every workday if cover not feasible; and • Approved Natural Resource Monitor must inspect equipment/work area for CTS before initial groundbreaking and after rain event	• General Minimization Measures • Species-Specific Avoidance Measures • No habitat compensation required	• General Minimization Measures • Species-Specific Avoidance Measures • Habitat compensation required when permanent impacts to uplands

Table 6. Summary Effects Determination for each T&E Species.

Travis AFB Projects and Activities	EFFECTS DETERMINATION					
	TAB A	TAB B	TAB C	TAB D	TAB E	TAB F
	VPFS	VPTS	CCG	CTS	DGGB	CFS
MISSION OPERATIONS						
Airfield and Flight Operations	NE	NE	NE	LAA	NE	NE
Security and Antiterrorism Operations	LAA	LAA	LAA	LAA	NLAA	NLAA
INFRASTRUCTURE SUPPORT						
Road Maintenance	LAA	LAA	LAA	LAA	NLAA	NE
ridge Construction and maintenance	NLAA	NLAA	NE	LAA	NLAA	NE
Runway/taxiway/ramp repair	LAA	LAA	LAA	LAA	NE	NE
Runway/taxiway/ramp maintenance	NE	NE	NE	NLAA	NE	NE
Facility Maintenance and Upgrade	LAA	LAA	LAA	LAA	NLAA	NE
Demolition	LAA	LAA	LAA	LAA	NLAA	NE
Aboveground Utility Lines	LAA	LAA	LAA	LAA	NLAA	NE
Underground Utility Lines	LAA	LAA	LAA	LAA	NLAA	NE
Culverts and Drainage Ditches	LAA	LAA	LAA	LAA	NLAA	NE
Mowing	BE	BE	BE	BE	BE	BE
Tree Trimming and Removal	NE	NE	NE	NE	NE	NE
Fencing Installation, Maintenance, and Replacement	LAA	LAA	LAA	LAA	NLAA	NE
INFRASTUCTURE DEVELOPMENT						
Minor Construction Projects	LAA	LAA	LAA	LAA	NLAA	NE
Facility Maintenance and Upgrade	LAA	LAA	LAA	LAA	NLAA	NE
ENVIRONMENTAL MANAGEMENT PROGRAMS						
ERP Site investigations and Remediation Methods*	LAA	LAA	LAA	LAA	LAA	LAA
ERP Site Operations and Maintenance*	LAA	LAA	LAA	LAA	LAA	LAA
ERP Groundwater Monitoring*	LAA	LAA	LAA	LAA	LAA	LAA
Invasive and Pest Species Removal	NLAA	NLAA	LAA	LAA	NLAA	NE
Grazing and Livestock Management	BE	BE	BE	BE	BE	NE
Sensitive Species Habitat Management	NLAA	NLAA	NLAA	BE	NLAA	NLAA
TS Burrow Inspection and Relocation	NE	NE	NE	LAA	NE	NE
Grassland Restoration	NLAA	NLAA	NLAA	NLAA	NE	NE
Wetland Restoration	LAA	LAA	LAA	LAA	NE	NE
Fire Suppression	LAA	LAA	LAA	LAA	NLAA	NE
Firebreak Maintenance	NLAA	NLAA	NLAA	LAA	NLAA	NE
Prescribed Fire	NLAA	NLAA	NLAA	LAA	NE	NE

NOTES:

LAA = Likely to Adversely Affect

NLAA = Not Likely to Adversely Affect

BE = eneficial ffect

NE = No effect

*may include off-base activities

Refer to Project Description for a detailed explanation of the project or management programs. Refer to individual tabs for detailed determinations.

Date sent to WS:

Project Title:

oject oponent:

CEIE C:

ocation: *Should Briefly Describe Where on Travis AFB o GSU project is occurring*

Species impacted: *State which species are being analyzed*

Effects Assessment: *State whether this is LAA/LAA*

Expected start date of project:

Project Description:

Describe in detail:

- Purpose and need for the project.
- Project site location including all work, staging and storage areas.
- Detailed narrative description of proposed project activity to include:
  - Description of work (soil disturbing or not, dimensions of disturbed area, depth of disturbance etc.)
  - Seasonal constraints of activity
  - Equipment needed to perform activity
  - Site ingress and egress plan
  - Other relevant information
- Show all of this on a map.

60 CES/CEIE Analysis:

Describe methods used for effects analysis including:

- Personnel and Methods used to determine effects (e.g. field methods, map analysis, expert consultation, etc.)
- Description of all potential or known listed species habitat within the project area including:
  - wetlands within 250 feet, if applica le
  - known occurrences of T&E species in Project Area including closest populations of all affected species
  - CTS upland habitat description and risk area location (Appendix A), if applicable
  - density and abundance of small mammal burrows in any uplands to be disturbed on the site
  - figures showing all applicable species and habitat information
- Describe how effects were considered for each species

Programmatic Biological Opinion Reference:

List the PBO Section and page number where the activity is described

Analysis of Effects:

Describe maximum expected disturbance area and how much of that is habitat (for each habitat type present) for the species (in acres).

Describe potential take (harm, harassment, etc.) that the activity may cause to the species present

Describe the impact if project not completed

Species-specific Minimization Measures which will NOT be implemented for this project:

Assumes all General measures (PBA section 1.5) will be implemented (if applicable)

Only list species-specific CMs that will not be implemented

Summary:

Summarize as follows:
"Travis AFB has determined that the proposed project should be considered and authorized for action because:

a.) the project fits within the scope of the actions described in the PBO,
b.) the effects analyzed are identical or similar to those that were analyzed in the PBO,
c.) sensitive time periods for listed species will be avoided to the extent practicable, and
d.) all pertinent minimization measures will be implemented.

We request concurrence from FWS within __ days *(14 ys r LAA and 30 ys r LAA)* of the date of this document. This project will also be discussed and/or listed within our annual report."

Site Maps and Project Figures:

Note: Use as many or few maps as needed to cover the information presented above.

Figure 1: Overview of Project location on Base

Figure 2: Overall project site map, showing project details (disturbance footprint, ingress/egress routes, staging areas, etc.)

Figure 3: Species and habitat information (wetlands, 250-foot buffer, C S breeding ponds, VPFS/VPTS/CCG point locations, CTS Risk area, etc.)