ENVIRONMENTAL ASSESSMENT
PERMANENT WESTERN UNITED STATES C-17 LANDING ZONE



Department of the Air Force
Air Mobility Command
Scott Air Force Base, Illinois

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Report Documentation Page

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14. ABSTRACT

The purpose of the proposed action is to establish LZs in the western United States where C-17 tactical arrival, departure, and landing training could be accomplished by C-17 aircrews from Travis AFB, California. The Proposed Action would construct and operate a 3,500-foot long, 90-foot-wide LZ with associated day/night LZ markings and an infrared lighting system for night vision goggle operations at Travis AFB and conduct operations on an existing LZ at the Grant County International Airport (Grant County Airport), Moses Lake, Washington. The Southern California Logistics Airport (SCLA) is the Alternative Action. Under the SCLA Alternative, the LZ would be constructed and operated at the SCLA. Additionally under the SCLA Alternative, C-17 aircrews from Travis AFB would also accomplish LZ operations on an LZ that would be established by painting the LZ markings on Runway 21Left/03Right at the Base and at the Grant County Airport. Resources considered in the impact analysis were: airspace and airfield operations (to include aircraft safety and bird/wildlife-aircraft strike hazard) noise; land use; air quality; biological resources (to include wetlands, storm water runoff and hydrology); cultural resources; and environmental justice.

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Finding of No Significant Impact
Permanent Western United States C-17 Landing Zone

AGENCY

Department of the Air Force; Headquarters, Air Mobility Command (HQ AMC); Scott Air Force Base (AFB), Illinois.

BACKGROUND

The Air Force will complete basing 13 C-17 aircraft at Travis AFB (the Base), California in 2008. A key ability of the C-17 aircraft is its capability to land and take off from a short runway called a landing zone (LZ) 3,500 feet to 5,000 feet long and 90 feet wide. An important element of C-17 basing is that aircrews have access to an airfield with an LZ where tactical arrival, departure, and landing training can be conducted. Currently, there is no LZ available near Travis AFB where aircrews from the Base can conduct training. To meet the training need, HQ AMC proposes to construct an LZ at either Travis AFB or the Southern California Logistics Airport (SCLA) (formerly George AFB), Victorville, California. An existing LZ at the Grant County International Airport (Grant County Airport), Moses Lake, Washington, would also be used for training.

Pursuant to National Environmental Policy Act (NEPA), 32 Code of Federal Regulations (CFR) 989 (*Air Force Environmental Impact Analysis Process*) (EIAP), and other applicable regulations, the Air Force completed an environmental assessment (EA) of the potential environmental consequences of constructing and operating C-17 LZs in the western United States. The attached EA, which is incorporated by reference and supports this Finding of No Significant Impact (FONSI), evaluated the No Action Alternative, Proposed Action, and SCLA Alternative.

NO ACTION ALTERNATIVE

HQ AMC would not construct or establish a permanent LZ in the western United States closer to Travis AFB than the Grant County Airport. Aircraft operations would remain at the current levels at Travis AFB, the SCLA, and the Grant County Airport, which is currently used for training by C-17 aircrews from McChord AFB, Washington.

PROPOSED ACTION

A 3,500-foot long, 90-foot wide LZ with associated day/night LZ markings and an infrared (IR) lighting system for night vision goggle (NVG) operations will be constructed on the Travis AFB airfield. Additionally, Travis AFB aircrews will accomplish operations on the existing LZ at the Grant County Airport. Approximately 23 average daily operations will occur at Travis AFB, and one average daily operation will occur at the Grant County Airport. Construction will begin in 2009 and be completed in one year or less, and airfield operations will begin when construction is completed. Operations will begin at the Grant County Airport in 2008.

SOUTHERN CALIFORNIA LOGISTICS AIRPORT ALTERNATIVE

A 3,500-foot long, 90-foot wide LZ with associated day/night LZ markings and an IR lighting system would be constructed on the SCLA airfield. Additionally, Travis AFB aircrews would accomplish operations on a LZ that would be established by painting LZ markings on

Runway 21Left/03Right at Travis AFB and on the existing LZ at the Grant County Airport. Approximately 12, 2, and 10 average daily operations, respectively, would occur at the SCLA, Travis AFB, and the Grant County Airport. Construction would begin in 2009 and be completed in one year or less, and airfield operations would begin when construction is completed. Operations would begin at Travis AFB and the Grant County Airport in 2008.

EVALUATION OF THE NO ACTION ALTERNATIVE

Aircraft Operations and Safety and Bird/Wildlife-Aircraft Strike Hazard. Air traffic control procedures, which accommodate the current aircraft operations, would continue to be used to control aircraft operations at Travis AFB, the SCLA, and the Grant County Airport. The risk of an aircraft involved in an accident striking a person or structure on the ground at or around any of the three airfields would continue to be low. Likewise, it would continue to be unlikely that any of the bird/wildlife-aircraft strike incidents at or around any of the three airfields would involve injury to either aircrews or the public, or damage property (other than the aircraft).

Noise. The number of persons exposed to aircraft noise and potentially highly annoyed at Travis AFB, the SCLA, and the Grant County Airport would remain at the current levels and would continue to be below the level at which risk to the general population may occur. The potential for persons to be awakened by aircraft noise would continue at the existing levels. No structural damage would occur from aircraft noise at or around any of the three airfields.

Land Use. Activities associated with continuation of the current aircraft operations would be consistent with land use in the areas surrounding Travis AFB, the SCLA, and the Grant County Airport.

Air Quality. Emissions from aircraft operations would continue at the current rates and would not exceed air quality standards at Travis AFB, the SCLA, and the Grant County Airport.

Biological Resources. The potential for adverse effects to biological resources on Travis AFB, the SCLA, and the Grant County Airport would be minimized through the continued use of existing natural resources management plans.

Cultural Resources. National Register of Historic Places (NRHP)-eligible resources at Travis AFB would continue to be managed under existing regulations and in accordance with procedures outlined in the Travis AFB Integrated Cultural Resources Management Plan. No NRHP-eligible cultural resources have been identified at the SCLA or the Grant County Airport.

EVALUATION OF THE PROPOSED ACTION

Aircraft Operations, Aircraft Safety, and Bird/Wildlife-Aircraft Strike Hazard. Travis AFB. The airfield has the capacity to accommodate the 15 percent increase in operations. The existing air traffic control procedures for the airspace surrounding the airfield will accommodate increased C-17 operations on the runways and the LZ. The risk is low that an aircraft involved in an accident or bird/wildlife-aircraft strike at or around the airfield will strike a person or structure on the ground. **Grant County Airport.** The airfield has the capacity to accommodate the less than 1 percent increase in operations. The summary for Travis AFB also applies to the Grant County Airport.

Noise. Travis AFB. The 382 persons exposed to Community Noise Equivalent Level (CNEL) 60 decibels (dBA) and greater equate to about 1 percent of the persons who live within a

5-mile radius of the airfield, the same percentage of exposure as the No Action Alternative. (Averaged sound exposure is expressed as the DNL metric except for California where the CNEL is used. In practice, CNEL and DNL are often used interchangeably.) One additional person could be awakened by aircraft noise from operations occurring during the nighttime (10:00 p.m. to 7:00 a.m.). Noise-induced hearing loss will not occur because individuals will not be exposed to noise for the duration at which loss could occur. Noise from C-17 operations will remain below the level at which damage to structures occurs. Therefore, there will be no damage to structures from increased C-17 operations. Construction noise will: (1) be temporary and occur only during the hours that construction and demolition activity will occur and will cease when the project is completed; and (2) likely not cause sleep interference. **Grant County Airport**. The 2,091 persons exposed to day-night average sound level (DNL) 65 dBA and greater equate to about 17 percent of the persons who live within a 5-mile radius of the airfield, or no change from the baseline. One additional person could be awakened by aircraft noise from operations occurring during the nighttime. The summary for noise-induced hearing loss and structural damage for Travis AFB also applies to the Grant County Airport.

Land Use. Travis AFB. In accordance with Air Installation Compatible Use Zone (AICUZ) program guidance, Travis AFB may provide the noise contours and the land use sections of the attached environmental assessment and any other relative data to local planning agencies to serve as an interim AICUZ report. A full update to the Travis AFB AICUZ Report will be provided to the community within one year of the completed mission change, funding and other constraints permitting. The Proposed Action at Travis AFB will be consistent with county and community plans because the noise contours from the project activities would not extend outward from the runway as far as the contours used in the plans. **Grant County Airport**. Land use plans for the area surrounding the airport will not be affected. The airport will not need to update or revise its Airport Master Plan.

Air Quality. Travis AFB. Emissions from both short-term construction activities and long-term recurring aircraft operations positively conform to the U.S. Environmental Protection Agency-approved emissions levels for Travis AFB in the state implementation plan. The greatest increase in emissions from recurring aircraft operations for any of the six criteria pollutants, when compared to the baseline emissions inventory, will be 0.752 percent for nitrogen oxides (NO_X). These emissions will not cause a violation of federal standards. A General Conformity Rule Conformity Determination is not required. **Grant County Airport**. The greatest increase in emissions from recurring aircraft operations for any of the six criteria pollutants, when compared to the baseline emissions inventory, will be 1.162 percent for NO_X. These emissions will not cause a violation of federal standards. A General Conformity Rule Conformity Determination is not required.

Biological Resources. Travis AFB. Listed species and wetland features will be subject to direct effects associated with LZ construction activities and indirect hydrological effects associated with the addition of impervious surfaces. ***Direct Effects.*** 35.1 acres of California tiger salamander (CTS) upland habitat will be permanently removed by construction activities, which includes 9.6 acres of newly paved surfaces, 25.3 acres between Runway 03R-21L and the proposed C-17 runway, and the construction and use of a 0.11 acre access spur from Perimeter Road to the C-17 runway construction area. In addition to permanent losses of upland CTS habitat, 23.0 acres of habitat will be temporarily lost due to grading activities on the proposed runway perimeter. These 23.0 acres are expected to return to suitable upland habitat conditions for the CTS within a few years. Effects on wetlands include the permanent removal of 0.42 acre of wetlands (0.18 acre of vernal pool habitat and 0.24 acre of seasonal wetlands), and the

temporary loss of 1.09 acres (0.64 acre of seasonal wetlands and 0.45 acre of drainage ditches). ***Indirect Effects.*** In addition to the 1.51 acres of wetlands delineated subject to permanent and temporary removal, 2.59 acres of delineated wetland features on-Base will be indirectly affected by the increased surface flows, as well as wetland features and drainages off-Base. Modeling (completed as part of Section 7 Endangered Species Act [ESA] consultation with the U.S. Fish and Wildlife Service [USFWS] Sacramento Ecological Services Field Office) suggests that surface flow volumes will increase by 0.7 acre-feet (increase of 18 percent over existing conditions) for a two-year storm event, 0.8 acre-feet for a five-year event (increase of 16 percent), and 0.9 acre-feet for a 10-year event (increase of 15 percent). The on-Base flows will be channeled into a tributary of Denverton Creek, which will experience increased volumes, peak flow discharge, and peak velocities from storm events. A two-year storm event will contribute an additional 0.7 acre-feet into the Denverton Creek tributary (7.5 percent increase over existing conditions), peak flow will increase by 1.07 cubic feet per second (cfs) (8.7 percent increase), and peak velocity will increase by 0.06 feet per second (ft/sec) (7.7 percent increase). A five-year storm event will contribute an additional 0.8 acre-feet of runoff into the Denverton Creek tributary (6.0 percent increase), peak flow will increase by 1.29 cfs (7.3 percent increase), and peak velocity will increase by 0.05 ft/sec (5.6 percent increase). A 10-year storm event will contribute an additional 0.9 acre-feet of runoff into the Denverton Creek tributary (5.3 percent increase), peak flow will increase by 1.41 cfs (6.5 percent increase), and peak velocity will increase by 0.05 ft/sec (5.3 percent increase). The direct removal of CTS upland habitat may adversely affect this species, and the indirect effects associated with the altered hydrological regime are expected to not adversely affect various special status invertebrate species. Section 7 ESA consultation with the USFWS resulted in conservation measures to minimize these effects. One federally listed plant species is not subject to direct or indirect effects of the proposed action, and therefore will not be affected. The Air Force will minimize impacts to CTS upland and breeding habitat taken during construction through the conservation and minimization measures contained in Subchapter 2.2.2.3 of the EA and in the Biological Opinion (BO) prepared by the USFWS (see Appendix D of the EA). The BO concluded that the Travis AFB C-17 LZ project, as proposed, is not likely to jeopardize the continued existence of the CTS. The BO also states that the proposed project is not located within designated critical habitat for the CTS; therefore, critical habitat for this species will not be adversely modified. **Grant County Airport**. There is no record of rare plants or high-quality ecosystems or listed species that occur at the airport.

Cultural Resources. **Travis AFB**. No NRHP-eligible resources were identified in the project area at Travis AFB; therefore the Proposed Action will have no effect on cultural resources. **Grant County Airport**. No NRHP-eligible resources were identified at the Grant County Airport; therefore, the Proposed Action will have no effect on cultural resources.

EVALUATION OF THE SOUTHERN CALIFORNIA LOGISTICS AIRPORT ALTERNATIVE

Aircraft Operations, Aircraft Safety, and Bird/Wildlife-Aircraft Strike Hazard. SCLA. The airfield has the capacity to accommodate the 14 percent increase in operations. The volumes of traffic in the airspaces at and surrounding the airport, in conjunction with the air traffic control procedures that would be developed to accommodate the C-17 operations, would not impair operations at the SCLA. The summary for aircraft safety and bird/wildlife-aircraft strike hazard for the Proposed Action at Travis AFB also applies. **Travis AFB**. The airfield has the capacity to accommodate the 1 percent increase in operations. The summary of the

bird/wildlife-aircraft strike hazard for the Proposed Action at Travis AFB also applies. **Grant County Airport.** The airfield has the capacity to accommodate the 4 percent increase in operations. The summary for air traffic control, aircraft safety, and bird/wildlife-aircraft strike hazard for the Proposed Action at the Grant County Airport also applies.

Noise. SCLA. The three persons exposed to CNEL 60 dBA and greater equate to less than 1 percent of the persons who live within a 5-mile radius of the airfield, a slight increase when compared to the No Action Alternative. One person could be awakened by aircraft noise from operations occurring during the nighttime. The summary for noise-induced hearing loss, structural damage, and construction noise for the Proposed Action at Travis AFB also applies. **Travis AFB.** The 381 persons exposed to CNEL 60 dBA and greater equate to about 1 percent of the persons who live within a 5-mile radius of the airfield, or no change from the baseline. One additional person could be awakened by aircraft noise from operations occurring during the nighttime. The summary for noise-induced hearing loss and structural damage for the Proposed Action at Travis AFB also applies. **Grant County Airport.** The 2,147 persons exposed to DNL 65 dBA and greater equate to about 17 percent of the persons who live within a 5-mile radius of the airfield, or no change from the baseline. Approximately five additional persons could be awakened by aircraft noise from operations occurring during the nighttime. The summary for noise-induced hearing loss and structural damage for the Proposed Action at Travis AFB also applies.

Land Use. SCLA. Land uses in the area of increased exposure are primarily open and the increase in noise would not impact land uses. The airport could update its Airport Master Plan to reflect the Federal Aviation Administration-established airspace imaginary surfaces for the LZ and the noise contours resulting from the aircraft operations. The City of Victorville could update its Comprehensive Airport Land Use Plan to reflect the changes to Safety Review Areas resulting from the construction of the LZ and the additional area exposed to CNEL 65 dBA. **Travis AFB.** The summary of Land Use for the Proposed Action at Travis AFB also applies. **Grant County Airport.** The summary of Land Use for the Proposed Action at the Grant County Airport also applies.

Air Quality. SCLA. The greatest increase in emissions from recurring aircraft operations for any of the six criteria pollutants, when compared to the baseline emissions inventory, will be 0.228 percent for volatile organic compounds. These emissions will not cause a violation of federal standards. A General Conformity Rule Conformity Determination would not be required. **Travis AFB.** The greatest increase in emissions from recurring aircraft operations for any of the six criteria pollutants, when compared to the baseline emissions inventory, will be 0.006 percent for NO_X. These emissions will not cause a violation of federal standards. A General Conformity Rule Conformity Determination would not be required. **Grant County Airport.** The greatest increase in emissions from recurring aircraft operations for any of the six criteria pollutants, when compared to the baseline emissions inventory, will be 1.242 percent for NO_X. These emissions will not cause a violation of federal standards. A General Conformity Rule Conformity Determination would not be required.

Biological Resources. SCLA. The SCLA is within the range of three special status species that may be affected by this alternative—the desert tortoise, the Mojave ground squirrel, and the burrowing owl. The California Department of Fish and Game (CDFG) has records of desert tortoise occurrence within the SCLA boundary; however, the distribution and life history requirements for this species coupled with the prior land use practices decreases the suitability of the desert tortoise habitat within the SCLA. The Mojave ground squirrel also has potential to

occur within the SCLA boundary; however, the SCLA LZ location does not contain alluvial fans or other landform features associated with the squirrel. The burrowing owl, a state species of concern, does occur within the SCLA boundary; however, there are no records of occurrence within the SCLA LZ site location although suitable habitat conditions are present. **Travis AFB.** No biological resources impacts would occur because the LZ would be established by painting the LZ markings on the existing Runway 21Left/03Right. **Grant County Airport.** The summary for the Proposed Action at the Grant County Airport also applies.

Cultural Resources. SCLA. Project activities would occur in areas previously disturbed by construction. No buildings or structures would be demolished or altered. No NRHP-eligible resources have been identified at the SCLA; therefore the Alternative Action would have no effect on cultural resources. **Travis AFB.** The summary for the Proposed Action at Travis AFB also applies. **Grant County Airport.** The summary for the Proposed Action at the Grant County Airport also applies.

MITIGATION AND CONSERVATION MEASURES

The Air Force EIAP (32 CFR 989) requires the FONSI to contain a concise summary of the mitigation and conservation measures the proponent for the proposed action has committed itself to adopt. Mitigation measures are not required for: aircraft operations, aircraft safety, and bird/wildlife-aircraft strike hazard; noise; land use; air quality; cultural resources; and environmental justice.

Conservation measures, as defined in the Endangered Species Consultation Handbook for Section 7 consultation, are actions to benefit or promote recovery of listed species included by the federal agency as an integral part of the proposed action. These actions are taken by the federal agency and serve to minimize or compensate for project effects on the species under review.

"Compensating" and "minimizing" are common to both the Section 7 consultation process and the CEQ guidance for accomplishing environmental impact analysis under NEPA. For this reason, "conservation measures" rather than "mitigation" are used in this FONSI for biological resources.

Proposed Action at Travis AFB

Conservation and minimization measures were identified during the scoping and Section 7 consultation processes, and are included as elements of the Proposed Action at Travis AFB. Implementation of the conservation measures will minimize and compensate for potential effects of the LZ project on the species under review. The Air Force has agreed to non-discretionary terms and conditions associated with the Incidental Take Statement from the BO. The Air Force commits to the following conservation and minimization measures for the Proposed Action at Travis AFB (see Subchapter 2.2.2.3 and the BO in Appendix D of the EA).

- **Purchase of Compensation Credits and/or Purchase and Preservation of an Approved Parcel**
- **Designation of the Resident Officer in Charge of Construction**
- **Designation of the Project Biologist**
- **Suspension of Construction Activities**
- **Environmental Education for Construction Personnel**

- **Controls for Project Related Construction Vehicle Traffic**
- **Litter Control During Construction**
- **Control of Firearms in Construction Project Area**
- **Control of Dogs and Cats in Project Area**
- **Installation of Exclusion Fencing Around Work Area**
- **Prevention of Encroachment into Sensitive Areas During Work Activities**
- **Inspection of Construction Activities by Regulatory Agencies**
- **Pre-Construction Surveys of Construction Project Site**
- **Monitoring of Initial Ground Disturbance Activities**
- **Preparation of Relocation Plan for CTS**
- **Capture and Handling of CTS**
- **Prevention of Introduction of Amphibian Diseases to the Project Area**
- **Prevention of Inadvertent Entrapment of CTS**
- **Use of Erosion Control Netting**
- **Regrading and Revegetating of Project Area**
- **Care of California tiger salamanders Injured by Project Construction Activities**
- **Post-Construction Compliance Report**
- **Preparation and Implementation of an Erosion Control and Restoration Plan**
- **Preparation, Submittal, and Implementation of Storm Water Pollution Prevention Plan (SWPPP)**
- **Effective Period for the Biological Opinion**
- **Vegetation Management in the Action Area**
- **Integrating Conservation Measures into Programmatic Agreements**

Southern California Logistics Alternative at the Southern California Logistics Airport

The conservation and minimization measures listed above apply to the Proposed Action at Travis AFB (*i.e.*, the Preferred Alternative). Should the Air Force choose, for an unforeseeable reason, the SCLA Alternative rather than the Proposed Action, three species of concern may be impacted. Selection of the SCLA Alternative would require conservation measures similar to those for the Proposed Action at Travis AFB to avoid, minimize, or offset impacts to the desert tortoise, Mojave ground squirrel, and/or the burrowing owl. The Air Force would conduct the necessary protocol surveys approved by the USFWS and/or CDFG to minimize impacts as appropriate. Conservation and minimization options could include purchasing credits through the Desert Tortoise Preserve Committee for assistance in land preserve acquisition or in-lieu fee payments to conservation organizations that manage for species of concern that could potentially be affected by the SCLA Alternative. Other conservation and minimization measures could be

developed in consultation with the CDGF and the USFWS Carlsbad Ecological Services Field Office.

CUMULATIVE IMPACTS

Ten and three other past, present, and reasonably foreseeable future construction projects would occur, respectively, at Travis AFB and the SCLA. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. None of these other projects include aircraft operations. No other actions would occur at the Grant County Airport. Therefore, there would be no cumulative impacts at the Grant County Airport. The following paragraphs evaluate cumulative impacts for the Proposed Action at Travis AFB and the SCLA Alternative at the SCLA and Travis AFB.

Evaluation of the No Action Alternative

Aircraft Operations, Aircraft Safety, and Bird/Wildlife-Aircraft Strike Hazard. There would be no cumulative impacts because none of the other actions at Travis AFB or the SCLA include aircraft operations. **Noise**. There would be no cumulative impacts for aircraft or construction noise because none of the other actions at Travis AFB or the SCLA include aircraft operations. No construction would occur at either installation under the No Action Alternative. **Land Use**. There would be no on-installation cumulative impacts because the LZ would not be constructed under the No Action Alternative at either Travis AFB or the SCLA. There would be no change in off-installation land use because there would be no additional aircraft operations that could change the noise exposure at either installation. **Air Quality**. There would be no cumulative impacts because no construction emissions would be generated by the No Action Alternative at either Travis AFB or the SCLA. Emissions from aircraft operations would continue at baseline levels at each installation. **Biological Resources**. There would be no cumulative impacts because the LZ would not be constructed under the No Action Alternative at either Travis AFB or the SCLA. **Cultural Resources**. There would be no cumulative impacts because the LZ would not be constructed under the No Action Alternative at either Travis AFB or the SCLA.

Evaluation of the Proposed Action

Aircraft Operations, Aircraft Safety, and Bird/Wildlife-Aircraft Strike Hazard. The summary for the No Action Alternative also applies to Travis AFB. **Noise**. Based on the distance from the LZ construction site at Travis AFB to the closest other action construction site, noise from LZ construction would attenuate to levels that, when combined with the noise from other action construction, would not produce cumulative impacts. There would be no cumulative impacts for aircraft noise because none of the other actions include aircraft operations. **Land Use**. None of the other facilities would be constructed in the general area associated with LZ activities at Travis AFB. **Air Quality**. The net change in emissions for criteria pollutants from construction activities would not be regionally significant, and would not exceed *de minimis* thresholds. Emissions from recurring aircraft operations do not violate air quality standards. **Biological Resources**. The potential for adverse effects to biological resources on Travis AFB would be minimized through the continued use of existing natural resources management plans. **Cultural Resources**: Because no NRHP eligible resources occur in the project area at Travis AFB, this project would not contribute to the cumulative impacts associated with other construction or alteration projects.

Evaluation of the Southern California Logistics Airport Alternative

Aircraft Operations, Aircraft Safety, and Bird/Wildlife-Aircraft Strike Hazard. The summary for the No Action Alternative also applies for the SCLA and Travis AFB. **Noise**. The summary for the Proposed Action also applies for the SCLA. There would be no construction noise cumulative impacts at Travis AFB because an LZ would not be constructed. Likewise, there would be no cumulative impacts for aircraft noise at the Base because none of the other actions include aircraft operations. **Land Use**. The summary for the Proposed Action also applies for the SCLA and Travis AFB. **Air Quality**. **SCLA**. The summary for the Proposed Action also applies for the SCLA. **Travis AFB**. No cumulative construction emissions would occur because the LZ would not be constructed. No recurring aircraft operation emissions would be generated by the others actions and emissions from recurring aircraft operations do not violate air quality standards. **Biological Resources**. **SCLA**. The other projects considered for cumulative impact purposes would occur within developed, maintained areas with highly modified and disturbed landscape. There would be no cumulative disturbance of high quality and/or native vegetation within either the project or adjacent areas due to the alternative action and other projects at the SCLA. **Travis AFB**. The summary for the Proposed Action also applies. **Cultural Resources**: **SCLA**. No NRHP eligible resources have been identified at SCLA, either within the current project area or any other future project areas. **Travis AFB**. The summary for the Proposed Action also applies.

ENVIRONMENTAL JUSTICE

Activities associated with the No Action Alternative, Proposed Action, and the SCLA Alternative will not impose significant adverse environmental effects on adjacent populations. Therefore, no disproportionately high and adverse effects will occur to minority and low-income populations.

Finding of No Practicable Alternative

This Finding of No Practicable Alternative (FONPA) addresses the Proposed Action at Travis AFB. The FONPA documents the Air Force's compliance with Executive Order (EO) 11990, *Protection of Wetlands*. The EO directs federal agencies to provide leadership and take action to minimize destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.

The EO requires that an agency shall avoid undertaking or providing assistance for new construction located in wetlands. The EO also requires that an agency must ensure that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use if the head of the agency finds no practicable alternative to such construction.

The Air Force considered the following alternatives on Travis AFB (see attached figure, Travis AFB Landing Zone Siting Alternatives), as well as the SCLA Alternative, as the site for the LZ.

- Alternative 1: Construct the LZ 2,500 feet east of the main instrument runway (Runway 21Left/03Right [21L/03R]) on off-Base land known locally as the Wilcox Ranch.
- Alternative 2: Construct the LZ 350 feet east of Runway 21L/03R on Travis AFB property.
- Alternative 3: Construct the LZ on a former taxiway southeast of Runway 03L/21R on Travis AFB property.
- Alternative 4: Construct the LZ by extending and converting Taxiway R on the Travis AFB airfield to an LZ.
- Alternative 5: Take no action.
- Alternative 6. Construct the LZ on the SCLA airfield.

The Air Force accomplished an alternatives evaluation and elimination process to select the best alternative for the location of the LZ.

- Alternative 1: This alternative requires land acquisition. Approximately 250 acres of environmentally sensitive land would be affected. The distance (*i.e.*, 2,500 feet) between the LZ and Runway 21L/03R would allow simultaneous operations on the two runways.
- Alternative 2: Approximately 65 acres of environmentally sensitive land would be affected. The short distance (*i.e.*, 350 feet) between the LZ and Runway 21L/03R would preclude simultaneous operations on the LZ and the runway. However, the airfield has the capacity to accommodate the increase in operations even when the two runways are considered as one for air traffic control purposes.
- Alternative 3: The LZ would be about 300 feet from Runway 21R/03L. Additionally, the LZ would be nearly on an extension of the Runway 21L/03R centerline, about 3,000 feet from the southwestern end of the runway. Operations on Runway 21R/03L would be discontinued when operations are being accomplished on the LZ. The proximity of the LZ to the main portion of Travis AFB and the aircraft parking ramp degrade the NVG and tactical training environment.
- Alternative 4: The LZ would be constructed between the northeast end of Runways 21R/03L and the southwest end of Runway 21L/03R. The approximate

600-foot distance between the LZ and each runway would preclude simultaneous operations on the LZ and Runways 21R/03L and 21L/03R. The proximity of the LZ to the main portion of Travis AFB and the aircraft parking ramp degrade the NVG and tactical training environment.

- Alternative 5: This alternative would not provide an LZ at which Travis AFB C-17 aircrews can conduct tactical arrival, departure, and landing training.
- Alternative 6. Overall, the SCLA Alternative did not rate as well as the Proposed Action at Travis AFB when considering the alternatives selection standards (see Subchapter 2.1.3 of the EA)

Based on the alternatives evaluation and elimination process, the preferred alternative is Alternative 2 (construct the LZ 350 feet east of Runway 21L/03R). As mentioned in the background section of the FONSI, there is a need for Travis AFB C-17 aircrews to have access to an airfield with an LZ where they can conduct tactical arrival, departure, and landing training. Thus, Alternative 5 would not meet the need. Although approximately 58 acres of environmentally sensitive land would be affected and the proximity of the LZ to Runway 21L/03R would preclude simultaneous operations on the LZ and the runway, Alternative 2 has fewer environmental impacts than Alternative 1 and would not affect airfield operations to the extent that Alternatives 3 and 4 would.

The most important impacts from constructing the LZ at the Alternative 2 site at Travis AFB include: (1) the permanent loss of 35.1 acres of upland CTS habitat due to paving and other construction activities, (2) the temporary loss of 23.0 acres of upland CTS habitat due to grading, (3) the permanent loss of 0.42 acre of wetlands (0.18 acre of vernal pool habitat and 0.24 acre of seasonal wetlands), (4) the temporary loss of 0.64 acre of seasonal wetlands and the rerouting of a 0.45 acre drainage ditch; and (5) the potential indirect impact to downstream wetland features from increased storm water volume, discharge, and flow velocity. The details and summary for biological resources for the Proposed Action at Travis AFB in the above FONSI apply to this FONPA.

Higher amounts of storm water pollutants have been known to be associated with sediments from urban areas than from rural areas. As such, pollutants from the LZ may become attached to storm water sediments and flow off-Base during storm events and into Denverton Creek. The storm water flows will combine with storm water originating from other areas, which do include agricultural areas. Once in the creek, these flows may come into contact with vernal pool habitat and may pose a risk to species. LZ design will include features that will detain storm water runoff to decrease volume, discharge, and flow velocity.

Construction of the LZ will require a Clean Water Act (CWA) Section 404/401 permit from the United States Army Corps of Engineers (USACE) San Francisco District. A wetlands delineation of the project area was conducted in 2008 and verified by USACE regulatory personnel on April 16, 2008. A total of 4.10 acres of wetlands and water features were delineated and determined to be jurisdictional under the CWA. Of these 4.10 acres, vernal pools accounted for 0.74 acre, seasonal wetlands amounted to 2.59 acre, and a drainage ditch occupied 0.77 acre of the survey area. Not all of these wetlands will be subject to direct removal resulting from the LZ construction and operation. Of the 4.10 acres determined to be jurisdictional under the CWA, a total area of 0.42 acre will be permanently removed (0.18 acre of vernal pools and 0.24 acre of seasonal wetlands) and 1.09 acres will be temporarily removed (0.64 acre of seasonal wetlands and 0.45 acre of drainage ditch rerouting). The construction contractor will prepare and implement a SWPPP containing best management practices to control sediment

leaving the project site. The contractor will install a debris curtain or other sediment control/protective barrier. With incorporation of these measures, adverse impacts to wetlands and habitats (that are directly removed by construction activities) will be avoided and minimized. The Air Force initiated formal Section 7 ESA consultation with the USFWS Sacramento Ecological Services Field Office on February 6, 2008 for impacts of the proposed action on special status species and habitats. The consultation package included the *Biological Assessment (BA) for the Construction and Operation of a Permanent Southwestern United States C-17 Landing Zone at Travis Air Force Base*, dated November 2007 (Parsons 2007), and the *Pre-Jurisdictional Wetlands and Waters of the U.S. Report for the Landing Zone Project*, dated November 2007. The BA concluded that the Proposed Action at Travis AFB will potentially adversely affect the CTS, not adversely affect special status invertebrate species, and not affect the Contra Costa goldfield. The BO concluded that the Travis AFB C-17 LZ project, as proposed, is not likely to jeopardize the continued existence of the California tiger salamander. The BO also states that the proposed project is not located within designated critical habitat for the salamander; therefore, critical habitat for this species will not be affected. The BO identifies the appropriate amount of compensatory conservation measures the Air Force and USFWS determined necessary to offset the potential adverse effect on the CTS from the direct and indirect impacts of the Proposed Action at Travis AFB. The Air Force will minimize impacts to CTS upland and breeding habitat taken during construction through implementation of the conservation and minimization measures (see Conservation and Minimization Measures in FONSI) and adherence to the non-discretionary terms and conditions associated with the Incidental Take Statement in the BO. Although the wetland features on-Base within the project area do not support threatened and endangered species, they are considered jurisdictional waters of the United States, and therefore require conservation and minimization through the Section 404/401 permitting process.

Pursuant to EO 11988, and taking the above information into account, there is no practicable alternative to the construction of the LZ 350 feet east of Runway 21L/03R on Travis AFB property, and that the Proposed Action at Travis AFB includes all practicable measures to minimize harm.

DECISION

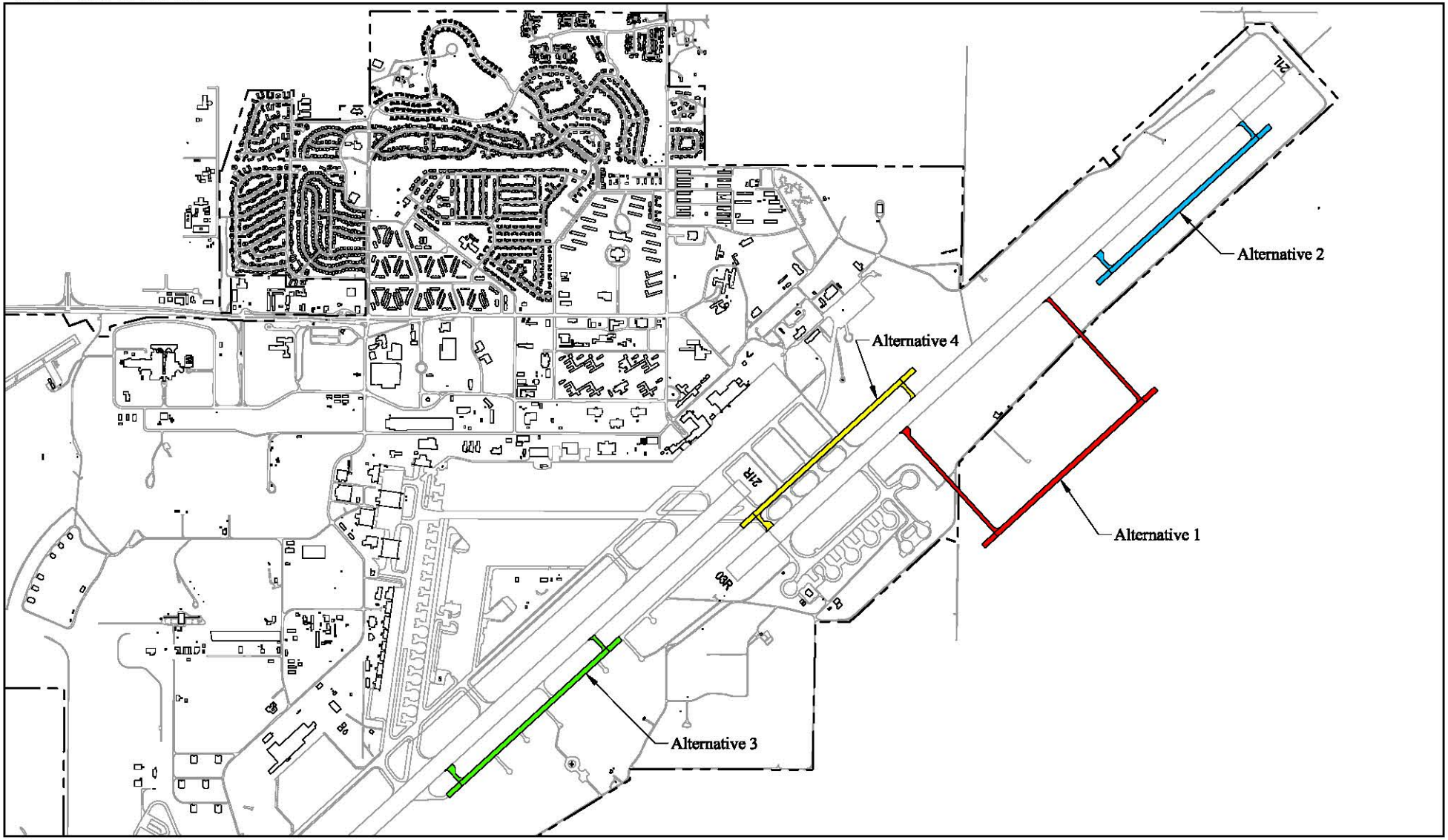
Based on my review of the facts and analyses contained in the attached EA, which is incorporated by reference, I conclude that implementation of the Proposed Action will not have a significant impact either by itself or when considering cumulative impacts. Accordingly, requirements of the NEPA, regulations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

Theresa C. Carter

THERESA C. CARTER, Colonel, USAF,
Director, Installations & Mission Support

19 Sep 08
Date

744211 WCLZ-TR-LZOPT.DWG



Travis AFB

LEGEND

Installation Boundary

Note:
Proposed LZ locations are approximate.

N

0 2,500
Feet

Travis AFB Landing Zone Siting Alternatives

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Environmental Assessment
Permanent Western United States C-17 Landing Zone

Department of the Air Force
Air Mobility Command
Scott Air Force Base, Illinois

September 2008

 Printed on recycled paper

ENVIRONMENTAL ASSESSMENT
Permanent Western United States C-17 Landing Zone

Responsible Agency: Department of the Air Force, Air Mobility Command, Scott Air Force Base (AFB), Illinois.

Proposed Action: Establish and operate permanent C-17 landing zones (LZs) in the western United States.

Written comments and inquiries regarding this document should be directed to: Mr. Doug Allbright, HQ AMC/A7PC, 507 Symington Drive, Scott AFB, Illinois 62225, (618) 229-0846.

Abstract: The purpose of the proposed action is to establish LZs in the western United States where C-17 tactical arrival, departure, and landing training could be accomplished by C-17 aircrews from Travis AFB, California. The Proposed Action would construct and operate a 3,500-foot long, 90-foot-wide LZ with associated day/night LZ markings and an infrared lighting system for night vision goggle operations at Travis AFB and conduct operations on an existing LZ at the Grant County International Airport (Grant County Airport), Moses Lake, Washington. The Southern California Logistics Airport (SCLA) is the Alternative Action. Under the SCLA Alternative, the LZ would be constructed and operated at the SCLA. Additionally under the SCLA Alternative, C-17 aircrews from Travis AFB would also accomplish LZ operations on an LZ that would be established by painting the LZ markings on Runway 21Left/03Right at the Base and at the Grant County Airport. Resources considered in the impact analysis were: airspace and airfield operations (to include aircraft safety and bird/wildlife-aircraft strike hazard); noise; land use; air quality; biological resources (to include wetlands, storm water runoff, and hydrology); cultural resources; and environmental justice.

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ACRONYMS AND ABBREVIATIONS

60 OSS/OSAA	60th Operations Support Squadron/Airfield Management/Base Operations
ADC	Air Defense Command
AFB	Air Force Base
AFI	Air Force Instruction
AGL	above ground level
AICUZ	Air Installation Compatible Use Zone
AIRFA	American Indian Religious Freedom Act
ALUC	Airport Land Use Commission
ANSI	American National Standards Institute
APCD	air pollution control district
APZ	accident potential zone
AQCR	air quality control region
ARFF	aircraft rescue and firefighting
AQMD	air quality management district
BA	biological assessment
BAAQMD	Bay Area air Quality Management District
BASH	bird/wildlife-aircraft strike hazard
BMP	best management practice
BO	biological opinion
CAA	Clean Air Act
CARB	California Air Resources Board
CEQ	Council on Environmental Quality
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
Community Plan Element	*City of Victorville Southern California Logistics Airport Community Plan Element*
CWA	Clean Water Act
CZ	clear zone
dB	decibel
dBA	A-weighted sound level measured in decibels
CDFG	California Department of Fish and Game
DNL	day-night average sound level
DoD	Department of Defense
EO	executive order
EA	environmental assessment
EIAP	environmental impact analysis process
EIS	environmental impact statement
EPP	Environmental Protection Plan
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation

FICAN	Federal Interagency Committee on Aviation Noise
FICON	Federal Interagency Committee on Noise
FICUN	Federal Interagency on Aviation Noise
FONPA	finding of no practicable alternative
FONSI	finding of no significant impact
ft/sec	foot per second
FY	fiscal year
Grant County Airport	Grant County International Airport, Moses Lake, Washington
HUD	United States Department of Housing and Urban Development
HQ AMC	Headquarters Air Mobility Command
IFR	instrument flight rules
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
ICRMP	Integrated Cultural Resources Management Plan
INM	integrated noise model
INRMP	Integrated Natural Resources Management Plan
IR	infrared
IUPAC	International Union of Pure and Applied Chemists
L_{EQ}	average noise
L_{max}	maximum sound level
LZ	landing zone
$\mu g/m^3$	micrograms per cubic meter
MBTA	Migratory Bird Treaty Act
MSL	mean sea level
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO	nitric oxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NPS	National Park Service
NRHP	National Register of Historic Places
NRIS	National Register Information System
NVG	night vision goggle
O_3	ozone
Pb	lead
PL	public law
PM_{10}	particulate matter equal to or less than 10 microns in aerodynamic diameter
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in aerodynamic diameter
ppm	parts per million
RAPCON	radar approach control
ROI	region of influence
RPZ	runway protection zone
SAIC	Science Applications International Corporation

SCLA	Southern California Logistics Airport
SEL	sound exposure level
SHPO	State Historic Preservation Office
SIP	state implementation plan
SO_2	sulfur dioxide
SO_x	sulfur oxides
SWPPP	Storm Water Pollution Prevention Plan
the Base	Travis AFB
T&E	threatened and endangered
tpy	tons per year
TRACON	terminal radar approach control
TSP	total suspended particulates
USC	United States Code
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compounds
VFR	visual flight rules
West Coast C-17 Basing EA	*Environmental Assessment West Coast Basing of C-17 Aircraft, June 2003*

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CHAPTER 1
PURPOSE OF AND NEED FOR ACTION

This chapter discusses the purpose of and need for action, the scope of the environmental review, and applicable regulatory requirements.

1.1 PURPOSE OF AND NEED FOR ACTION

The Air Force and Headquarters, Air Mobility Command (HQ AMC) have a need to establish landing zones (LZ) in the western United States where C-17 tactical arrival, departure, and landing training could be accomplished by C-17 aircrews from Travis Air Force Base (AFB), California. The LZ airfields should: allow LZ operations without conflicting with other aircraft operations; be conducive for night vision goggle (NVG) training; have other longer runway(s) and crash, rescue, and fire protection services; weather favorable for training; and allow operations at times that coincide with Travis AFB training schedules.

1.2 SCOPE OF THE ENVIRONMENTAL REVIEW

This environmental assessment (EA) assesses:

- the proposed construction of an LZ at either Travis AFB or the Southern California Logistics Airport (SCLA) (formerly George AFB), Victorville, California;
- recurring C-17 LZ operations on the LZ that would be constructed at Travis AFB or the SCLA and at the Grant County International Airport (Grant County Airport), Moses Lake, Washington; and,
- the No Action Alternative.

This EA identifies, describes, and evaluates the potential environmental impacts that may result from constructing and operating the LZ. The EA also identifies required environmental permits relevant to the establishment and operation of the LZ. As appropriate, the affected environment and environmental consequences from constructing and operating the LZ and No Action Alternative may be described in terms of site-specific descriptions or regional overview. Finally, the EA identifies mitigation and conservation measures to prevent or minimize environmental impacts, if required. Figure 1-1 depicts the location of the installations.

The Air Force is basing a total of 13 C-17 aircraft at Travis AFB. The first C-17 aircraft arrived at Travis AFB in fiscal year 2006 (FY06), with the 13th aircraft scheduled to arrive in FY08. The federal fiscal year begins October 1st and ends on September 30th of the following year.

The action to base and operate C-17 aircraft at Travis AFB (the Base) was assessed in an EA entitled *Environmental Assessment West Coast Basing of C-17 Aircraft,*

June 2003 (West Coast C-17 Basing EA) (USAF 2003a). The Finding of No Significant Impact (FONSI) for the proposal was signed July 21, 2003.

An important element of C-17 basing is that aircrews have access to an airfield with a short runway, called a landing zone 3,500 feet to 5,000 feet long and 90 feet wide. The LZ is used to train and evaluate aircrews in conditions that closely approximate what they will experience in an operational environment. Air Force planning prior to initiation of the Travis AFB C-17 basing environmental impact analysis process (EIAP) identified the need for an LZ. The West Coast C-17 Basing EA states the following: "There are no LZs within a reasonable proximity to Travis AFB. As a result, an LZ needs to be identified. However, a location for the LZ has yet to be determined. Due to lack of available complete information, the proposed construction of an LZ will undergo analysis for decision-making at a later time. In this particular case, basing of C-17s at an active duty west coast Air Force base is ripe for decision. However, the decisions to identify, operate, and support an LZ for the Proposed Action have not been resolved at this time. As a result, analyses specific to the proposed LZ for the Proposed Action will be presented in a separate National Environmental Policy Act (NEPA) document that will include a cumulative impacts analysis of the entire Proposed Action (32 Code of Federal Regulations [CFR] 989.10)."

1.2.1 Resources Considered in the Environmental Assessment

The following biophysical resources are assessed in this EA: aircraft operations (to include aircraft safety, and bird/wildlife-aircraft strike hazard [BASH]); noise; land use; air quality; biological resources (to include wetlands, storm water runoff, and hydrology); cultural resources; and environmental justice.

1.2.2 Resources Not Considered in the Environmental Assessment

Earth Resources. Construction associated with the LZ would occur in portions of Travis AFB or the SCLA that have been disturbed and altered by previous activities. Soil disturbance would occur primarily on the surface for site preparation and construction. Trenching for electricity lines for the LZ lights would occur at depths estimated to be no greater than 2 feet below the ground surface. Erosion control measures identified in the Storm Water Pollution Prevention Plan (SWPPP) that would be prepared for the construction project, and which would be implemented by the construction contractor, would minimize erosion. No construction would be required at the Grant County Airport. For these reasons, no geologic, physiographic, or soil impacts would be anticipated from the LZ construction, and earth resources are not analyzed further in this EA.



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Location of Potential Installations for the Western United States Landing Zone

Figure 1-1

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Hazardous Materials, Hazardous Waste, and Stored Fuels. Aircraft maintenance and refueling at Travis AFB, the SCLA, and the Grant County Airport would not increase above current levels as a result of the proposed action. It is anticipated that the quantity of hazardous waste generated during construction at Travis AFB or the SCLA would be negligible and limited to fuel and equipment maintenance products. The construction contractor would maintain records of all waste determinations, including appropriate results of analysis performed, substances and sample locations, date and time of collection, and other pertinent data as required by regulatory guidance. No construction would be required at the Grant County Airport. No impacts would be anticipated to hazardous materials, hazardous waste, and stored fuels, and these resources are not analyzed further in this EA.

Environmental Management. No structures would be demolished. Therefore, no asbestos or lead-based paint would be encountered at Travis AFB, the SCLA, or the Grant County Airport as a result of the proposed action. Additionally, there is no contaminated groundwater, soil, or sediment where the LZ would be constructed at Travis AFB (USAF 2003a). Likewise, on- and off-site groundwater and soil at the SCLA do not present a past, present, or future public health hazard (ATSDR 2007). Due to the proximity of the proposed LZ sites at Travis AFB and the SCLA to an active runway, the sites are open areas with no structures or other activities. No construction would be required at the Grant County Airport. For these reasons, no asbestos, lead-based paint, contaminated groundwater, or contaminated soil impacts would be anticipated and the resources are not analyzed further in this EA.

Infrastructure and Utilities. There would be no long-term change in water consumption or wastewater generation from the current levels because no additional Air Force personnel would be assigned to Travis AFB and no Air Force personnel would be assigned to the SCLA or the Grant County Airport as a result of the action. For these reasons, no water or wastewater system impacts would be anticipated. No buildings requiring use of electricity and natural gas would be constructed. The estimated 5.7 tons per day of waste from LZ construction would be minor when compared to the average daily disposal of 2,192 tons per day at the landfill where Travis AFB debris is disposed. Generation of construction debris at Travis AFB or the SCLA would occur for about a year and would end when construction is completed. Additionally, contracts for construction at either location would require the contractor to recycle construction debris to the maximum extent possible, thereby reducing the amount of debris that would be disposed in a landfill. Construction contractor vehicle traffic would be consistent in both level and type with similar on-going projects. No construction would be required at the Grant County Airport. For these reasons, no infrastructure and utilities impacts would be anticipated and the resources are not analyzed further in this EA.

Storm Water. Storm water control features would be developed and implemented to comply with regulatory guidance as part of the construction project at Travis AFB or the SCLA. The control features would avoid impacts at the SCLA. No construction would be required at the Grant County Airport. For these reasons, storm water is not

analyzed further in this EA for the SCLA or the Grant County Airport. Although the storm water control features would be implemented at Travis AFB, there is potential for impact to endangered species in the area around the proposed LZ site at Travis AFB from storm water. Therefore, storm water at Travis AFB is assessed under biological resources.

Socioeconomic Resources. There would be no change in the number of personnel at Travis AFB, the SCLA, or the Grant County airport as a result of the proposed action. Thus, no long-term changes would be anticipated to area population, housing requirements, school enrollment, or economic factors (*i.e.*, sales volume, income, or employment). It is not anticipated that construction workers would relocate to either the Travis AFB or the SCLA areas as a result of the proposed activities because both Travis AFB and the SCLA are located near highly populated areas with large labor pools. Thus, there would be no short-term impacts to area population, housing requirements, or school enrollment. There could be a positive benefit to the economic factors from the proposed construction activities. However, these benefits would end when the project is completed. For these reasons, socioeconomic resources are not analyzed further in this EA.

Water Resources and Floodplain. There are no surface water features (*i.e.*, wetlands, ponds, or streams) on or immediately adjacent to the proposed SCLA LZ site (USFWS 2007). The water table below the SCLA LZ site ranges from about 90 to 100 to 6.5 feet below ground surface, and construction activity is estimated to occur at depth no greater than 4 feet below the surface. The LZ site at the SCLA is outside the area that would flood during a 100-year flood event (City of Victorville undated b). Standard erosion control measures would be implemented during LZ construction to minimize the potential for nutrients, pollutants, and sediment from entering a surface or ground water feature. No construction would be required at the Grant County Airport. For these reasons, no surface water, ground water, wetland, or floodplain impacts would be anticipated, and those resources are not analyzed further in this EA for the SCLA or the Grant County Airport. The distance between the Travis AFB LZ site and the nearest 100-year floodplain is greater than 5,000 feet (USAF 2003a) and floodplain is not further analyzed at the Base.

Biological Resources (Grant County Airport). No construction would occur at the Grant County Airport because the LZ markings and infrared (IR) lighting system for NVG operations are installed alongside the LZ at the airport. Requests for information were sent to the United States Fish and Wildlife Service (USFWS) and Washington State Department of Natural Resources during preparation of the Grant County International Airport Master Plan Update. Washington State responded that it has no record of rare plants or high-quality ecosystems at the airport. The USFWS indicated that no listed species occur at the airport (Grant County International Airport 2005). For these reasons, no biological resources impacts would be anticipated, and this resource is not analyzed further in this EA for the Grant County Airport.

Migratory Bird Treaty Act and Sikes Act. The Migratory Bird Treaty Act (MBTA) of 1918 implemented the 1916 convention between the U.S. and Great Britain for the protection of birds migrating between the U.S. and Canada. Similar conventions between the U.S. and Mexico (1936), Japan (1972), and the former U.S.S.R (1976) further expanded the scope of international protection of migratory birds. Each new treaty has been incorporated into the MBTA as an amendment. The MBTA establishes Federal responsibilities for the protection of 836 species of migratory birds. Incidental take of migratory birds during Department of Defense (DoD) military readiness activities is addressed by a regulation promulgated by the Secretary of the Interior and published in the Federal Register on February 28, 2007 (50 CFR Part 21). Although Travis AFB, the SCLA, and the Grant County Airport all are within the Pacific Flyway (one of four major migration flyways in North America), the Proposed Action and alternatives would not result in additional takes of birds protected by the MBTA because the Air Force reduces potential bird-aircraft strikes through the BASH planning process. Further, the Travis AFB Integrated Natural Resources Management Plan (INRMP), in accordance with the Sikes Act (as amended), provides management benefits to wildlife species while ensuring a no-net loss in military mission activities. The Proposed Action and alternatives would not conflict with the current Travis AFB INRMP. For these reasons, MBTA and Sikes Act (as amended) issues are not analyzed further in this EA.

1.2.3 Permanent Western United States C-17 Landing Zone Operations

As mentioned in Subchapter 1.1, there will be 13 C-17s based at Travis AFB. Based on Air Force guidance for the number of LZ-related training events per aircrew member, the Air Force initially estimated that 7,780 annual LZ aircraft operations would be accomplished by the aircrews associated with the 13 aircraft. Air Force experience is that installations with aircrews who have a requirement for LZ training (to include both C-17 and C-130 aircraft) often send their aircrews to LZs other than the one primarily used for training by the installation because training at a variety of airfields increases training effectiveness and realism. The effectiveness is increased because each LZ presents, for example, different weather conditions and arrival, departure, and closed pattern tracks. Additionally, there may be times when Travis AFB would have to increase training over a short period of time due to an unforeseen requirement, resulting in more annual operations than those based solely on the number of operations required by aircrew training guidance. Therefore, the number of annual C-17 operations evaluated in this EA includes the minimum number of operations based on the training guidance, the estimated operations for increased short-term training, and the estimated operations by C-17s from other installations, which equates to 8,558 annual operations. The analysis also includes the estimated 3,745 annual C-130 operations that would occur on the LZ.

1.2.4 Interagency and Intergovernmental Coordination for Environmental Planning and Public Involvement

Interagency and Intergovernmental Coordination for Environmental Planning

To comply with the IICEP, the Air Force notified numerous agencies in California and Washington State of the intent to prepare an EA for the construction and operation of permanent C-17 LZs in the western United States. Appendix A contains the IICEP correspondence.

Public Involvement

The Air Force Environmental Impact Analysis Process (EIAP) (32 CFR 989) sets forth the public involvement process. Public involvement is accomplished to allow citizens and interested parties the opportunity to participate in the EIAP. Appendix B contains additional information related to public involvement.

1.2.5 Environmental Justice

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued by the president on February 11, 1994. In the EO, the president instructed each federal agency to make "…achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." The EO also requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. Based on analysis conducted for this EA, it is determined that activities associated with the No Action Alternative, Proposed Action, and the SCLA Alternative would not impose significant adverse environmental effects on adjacent populations. Therefore, no disproportionately high and adverse effects would occur to minority and low-income populations.

1.3 APPLICABLE REGULATORY REQUIREMENTS

To comply with NEPA, the planning and decision-making process for actions proposed by federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations. It addresses them collectively in the form of an EA or environmental impact statement (EIS), which enables the decision-maker to have a comprehensive view of major environmental issues and requirements associated with the proposed action. According to CEQ regulations, the requirements of NEPA must be integrated "…with other planning and environmental review procedures required by law or by agency regulation so that all such procedures run concurrently rather than consecutively."

National Environmental Policy Act and Air Force Environmental Impact Analysis Process

The *National Environmental Policy Act* of 1969, as amended, requires federal agencies to consider environmental consequences in the decision-making process. The President's Council on Environmental Quality (CEQ) issued regulations to implement NEPA that include provisions for both content and procedural aspects of the required environmental analysis. The Air Force EIAP is accomplished through adherence to the procedures set forth in CEQ regulations (40 CFR Sections 1500-1508) and 32 CFR 989, *Air Force Environmental Impact Environmental Impact Analysis Process.* These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation designed to ensure that deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. The CEQ regulations require that an EA:

- Provide a summary of the evidence and analysis to determine whether the Proposed Action or alternative actions might have significant effects that would require preparation of an EIS. If analysis determines that the environmental effects would not be significant, a FONSI would be prepared;
- Facilitate preparation of an EIS, when required; or
- Aid an agency's compliance with NEPA when no EIS is necessary.

Interagency and Intergovernmental Coordination for Environmental Planning

Air Force Instruction (AFI) 32-7060 (*Interagency and Intergovernmental Coordination for Environmental Planning*) provides the procedures to comply with applicable federal, state, and local directives for Interagency and Intergovernmental Coordination for Environmental Planning (IICEP). AFI 32-7060 implements:

- Air Force Planning Document 32-70, *Environmental Quality*;
- DoD Directive 4165.61, Intergovernmental coordination of DoD Federal Development Programs and Activities;
- EO 12372, Intergovernmental Review of Federal Programs;
- Title IV of the Intergovernmental Coordination Act of 1968; and
- Section 204 of the Demonstration Cities and Metropolitan Development Act of 1966.

Aircraft Safety and Bird/Wildlife-Aircraft Strike Hazard

AFI 91-202, *The U.S. Air Force Mishap Prevention Program,* establishes mishap prevention program requirements (including the BASH program), assigns responsibilities for program elements, and contains program management information.

Noise

Land Use guidelines established by the United States Department of Housing and Urban Development (HUD) and findings of the Federal Interagency Committee on Noise (FICON) recommend acceptable levels of noise exposure for land use.

Air Quality

The *Clean Air Act* (CAA) (42 U.S. Code [USC] 7401-7671g) establishes federal policy to protect and enhance the quality of the nation's air resources to protect human health and the environment. The CAA requires that adequate steps be implemented to control the release of air pollutants and prevent significant deterioration in air quality. The 1990 amendments to the CAA require federal agencies to determine the proposed actions with respect to state implementation plans for attainment of air quality goals.

Title V of the CAA amendments of 1990 requires most large source emitters and some smaller sources to obtain a permit called a Title V operating permit. An operating permit is a legally enforceable document that permitting authorities issue to air pollution sources after the source has begun to operate. Most Title V permits are issued by state and local permitting authorities. The purpose of Title V permits is to reduce violations of air pollution laws and improve enforcement of those laws.

The Air Force prepared a CAA General Conformity Applicability Analysis for Travis AFB (see Appendix C). The Analysis, which was submitted to the Bay Area Air Quality Management District (BAAQMD) on December 11, 2007, shows that emissions from the project, when combined with other recurring emissions at Travis AFB, would not exceed U.S. Environmental Protection Agency (USEPA)-approved emissions levels for the Base in the state implementation plan (SIP). The BAAQMD responded in a December 20, 2007 letter that the Proposed Action at Travis AFB conforms to the SIP. Appendix C contains the Conformity Applicability Analysis and the BAAQMD letter.

Biological Resources

The Endangered Species Act (ESA) (16 USC 1531 *et seq*.) requires federal agencies that fund, authorize, or implement actions to avoid jeopardizing the continued existence of federally listed threatened or endangered species, or destroying or adversely affecting their critical habitat. Federal agencies must evaluate the effects of their actions through a set of defined procedures, which can include preparation of a biological assessment (BA) and formal consultation with the USFWS.

The Air Force initiated informal consultation with the USFWS under Section 7 of the ESA when meeting with the USFWS the USFWS on October 13, 2006. A BA was prepared and submitted to the USFWS for the Proposed Action at Travis AFB on February 5, 2008 in support of formal consultation under the ESA. The formal consultation period began February 5, 2008. Appendix D contains the BA and the letter requesting formal consultation. The USFWS prepared a biological opinion (BO, see

Appendix D) on June 12, 2008 in response to the BA. The BO concluded that the Travis AFB C-17 LZ project, as proposed, is not likely to jeopardize the continued existence of the California tiger salamander. The BO also states that the proposed project is not located within designated critical habitat for the salamander; therefore, critical habitat for this species will not be affected. The BO also contains a history of consultation.

Cultural Resources

The *National Historic Preservation Act* of 1966, as amended (NHPA) (16 USC 470, *et seq*.) provides the principal authority used to protect historic resources, establishes the National Register of Historic Places (NRHP), and defines in Section 106, the requirements for federal agencies to consider the effects of an action on properties on or eligible for inclusion on the NRHP. *Protection of Historic and Cultural Properties* (36 CFR Part 800 [1986]) provides an explicit set of procedures for federal agencies to meet their obligation under the NHPA, including inventorying of resources and consultation with state historic preservation offices. *The Archaeological Resources Protection Act of 1979* (16 USC 470, *et seq*.) ensures that federal agencies protect and preserve archaeological resources on federal or Native American lands, and establishes a permitting system to allow legitimate scientific study of such resources. Appendix E contains correspondence associated with notification of Native American tribes that may have an interest in the proposed action.

Land Use

Air Force Instruction 32-7063, *Air Installation Compatible Use Zone (AICUZ) Program*, provides guidance to air bases and local communities in planning land uses compatible with airfield operations. The AICUZ program describes existing aircraft noise and flight safety zones on and near Air Force installations with a flying mission.

Clean Water Act

The *Clean Water Act (CWA) of 1977* and the *Water Quality Act of 1987* (33 USC 1251, *et seq*., as amended) established federal policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters and, where attainable, to achieve a level of water quality that provides for the protection of fish, shellfish, wildlife, and recreation in and on the water.

Construction contractors would prepare and implement an Environmental Protection Plan (EPP). The contractor would provide the EPP to Travis AFB for submittal to the appropriate regulatory agencies.

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CHAPTER 2
ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter presents the following: discussion of the alternatives formulation and consideration, detailed descriptions of the proposed alternatives, identification of the preferred alternative, comparison of the environmental effects of all alternatives, and mitigation.

2.1 ALTERNATIVES FORMULATION AND CONSIDERATION

National Environmental Policy Act implementing regulations require analysis of the proposed action and "all reasonable alternatives" to the proposed action, including a No Action Alternative. CEQ regulations allow for eliminating alternatives from detailed study and require that a NEPA document discuss the reasons that an alternative was eliminated. The Air Force EIAP (32 CFR Part 989) provides a process for determining "reasonable" alternatives (thus requiring analysis) and a process based on reasonable selection standards for eliminating from detailed analysis alternatives determined not to be "reasonable."

"Reasonable" alternatives are those that meet the underlying purpose and need for the proposed action (see Subchapter 1.1) that would cause a reasonable person to inquire further before choosing a particular course of action. The Air Force also must consider reasonable alternatives raised during the scoping process or suggested by others, as well as combinations of alternatives. The Air Force need not analyze highly speculative alternatives, such as those requiring a major, unlikely change in law or governmental policy. If the Air Force identifies a large number of reasonable alternatives, it may limit alternatives selected for detailed environmental analysis to a reasonable number of examples covering the full spectrum of alternatives (32 CFR Part 989.8(b)).

The Air Force may expressly eliminate alternatives from detailed analysis based on reasonable selection standards (*e.g.*, operational, technical, or environmental standards suitable to a particular project). The Air Force may develop written selection standards to firmly establish what is a "reasonable" alternative for a particular project, but it must not so narrowly define these standards that it unnecessarily limits considerations to the proposal initially favored by proponents (32 CFR Part 989.8(c)).

2.1.1 Selection Standards for Alternatives

Two separate processes were accomplished as part of the action to establish permanent C-17 LZs in the western United States. The first process considered the installation and the second process considered the site for the LZ on the installation.

2.1.1.1 Selection Standards for Installation Alternatives

At present, the only suitable LZ in the western United States for C-17 tactical arrival, departure, and landing training is at the Grant County Airport. Aircrews from McChord AFB, Washington, which has 48 C-17s, use the Grant County Airport for training. It is impossible to keep all west coast C-17 aircrews trained and proficient on LZ operations with only one LZ in the western United States. Furthermore, it would be inefficient and impractical for both Travis and McChord AFBs to use the Grant County Airport as the sole LZ for all training on a long-term basis due to:

- airport traffic pattern saturation due to C-17 operations;
- the level of civil aircraft operations at the airport; and
- the distance from Travis AFB (about 600 miles) to the airport.

Tactical arrival, departure, and landing training are best accomplished at an airfield that has both an LZ and longer main runway. This allows aircrews to practice tactical training and other non-tactical takeoffs and landings at the same airfield, thereby maximizing use of training time. Landings on the LZ are typically followed by a takeoff from the main runway to a closed pattern to either the LZ or main runway.

The Air Force prepared selection standards for use in developing and evaluating alternatives for the airfields to be used as permanent C-17 LZs. The following paragraphs describe the selection standards.

Airspace. Other aircraft operating at the LZ airfield should not conflict with C-17 tactical arrivals, departures, and landings and other training operations. The LZ airfield should not be located in or near airspace that would prohibit maneuvering for approaches to the LZ and which could restrict C-17 training operations.

Night Vision Goggle Environment. Lighting around the airfield should be low intensity, allowing for an environment conducive to NVG training.

Existing Infrastructure. An LZ location that allows aircraft to land on the LZ and taxi to a longer runway (minimum length 5,000 feet) to takeoff is desired. Aircraft crash, rescue, and fire protection services must be available at the LZ airfield during the hours C-17 training would be accomplished.

Weather. The potential LZ location should have recorded cross-wind, visibility, and precipitation data to determine if weather at the airfield is favorable for LZ operations and other associated aircraft movements such as take-off after a tactical landing.

Operations Hours. The times at which the potential LZ location is available for training must coincide with the Travis AFB training schedules.

2.1.1.2 Selection Standards for Siting Alternatives

The Air Force prepared selection standards for use in developing and evaluating alternatives for siting the LZ on the installation selected for the permanent C-17 LZs. The following paragraphs describe the selection standards.

Land Acquisition. A site that requires no acquisition of land would be preferred. However, if land must be acquired, the site requiring fewer acres would be preferred.

Environmental Factors. A site that has no environmental issues would be preferred. However, if there are environmental impacts on the sites, the site with fewer impacts would be preferred.

Airfield Operations. The preferred site would be one that allows simultaneous operations on the LZ and other runways at the airfield. The site also should minimize to the maximum extent possible overflight of other runways and aircraft parking areas by aircraft operating on the LZ. However, if there are airfield operations impacts at the sites, the site with fewer impacts would be preferred.

2.1.2 Identification of Installation and Siting Alternatives

2.1.2.1 Installation Alternatives

In addition to the No Action Alternative, Table 2.1-1 lists the 18 airfields initially identified as viable locations for the permanent LZs.

Table 2.1-1 Potential Airfields for a Permanent Landing Zone in the Western United States

Installation
Barstow-Daggett, Daggett, California
Beale AFB, California
Bicycle Lake Army Airfield, Fort Irwin, California
Castle Airport (formerly Castle AFB), Merced, California
Former Naval Auxiliary Landing Field Crows Landing (Crows Landing), Crows Landing, California
Desert Center, California
EAF Twentynine Palms, California
Edwards AFB, California
Grant County Airport
Marine Corps Air Station Yuma, Arizona
Meadows Field, Bakersfield, California
Naval Air Facility El Centro, California
Naval Air Station Lemoore, California
Production Flight Test Installation, Air Force Plant 42, Palmdale, California
SCLA
Tonopah Test Range, Nevada
Travis AFB
Vandenberg AFB, California

Source: USAF 2006.

2.1.2.2 Siting Alternatives

Travis AFB

The Air Force considered the following sites on Travis AFB for an LZ (see Figure 2-1).

- Alternative 1: Construct the LZ 2,500 feet east of the main instrument runway (Runway 21Left/03Right [21L/03R]) on off-Base land known locally as the Wilcox Ranch.
- Alternative 2: Construct the LZ 350 feet east of Runway 21L/03R on Travis AFB property.
- Alternative 3: Construct the LZ on a former taxiway southeast of Runway 03L/21R on Travis AFB property.
- Alternative 4: Construct the LZ by extending and converting Taxiway R on the Travis AFB airfield to an LZ.

Southern California Logistics Airport

The Air Force, in consultation with the SCLA Manager, considered the following sites on the SCLA for an LZ (see Figure 2-2).

- Alternative 1: Construct the LZ 700 feet west of Runway 17/35.
- Alternative 2: Construct the LZ on the southern portion of the Runway 17/35 parallel taxiway.

2.1.3 Application of Selection Standards to the Installation and Siting Alternatives Considered

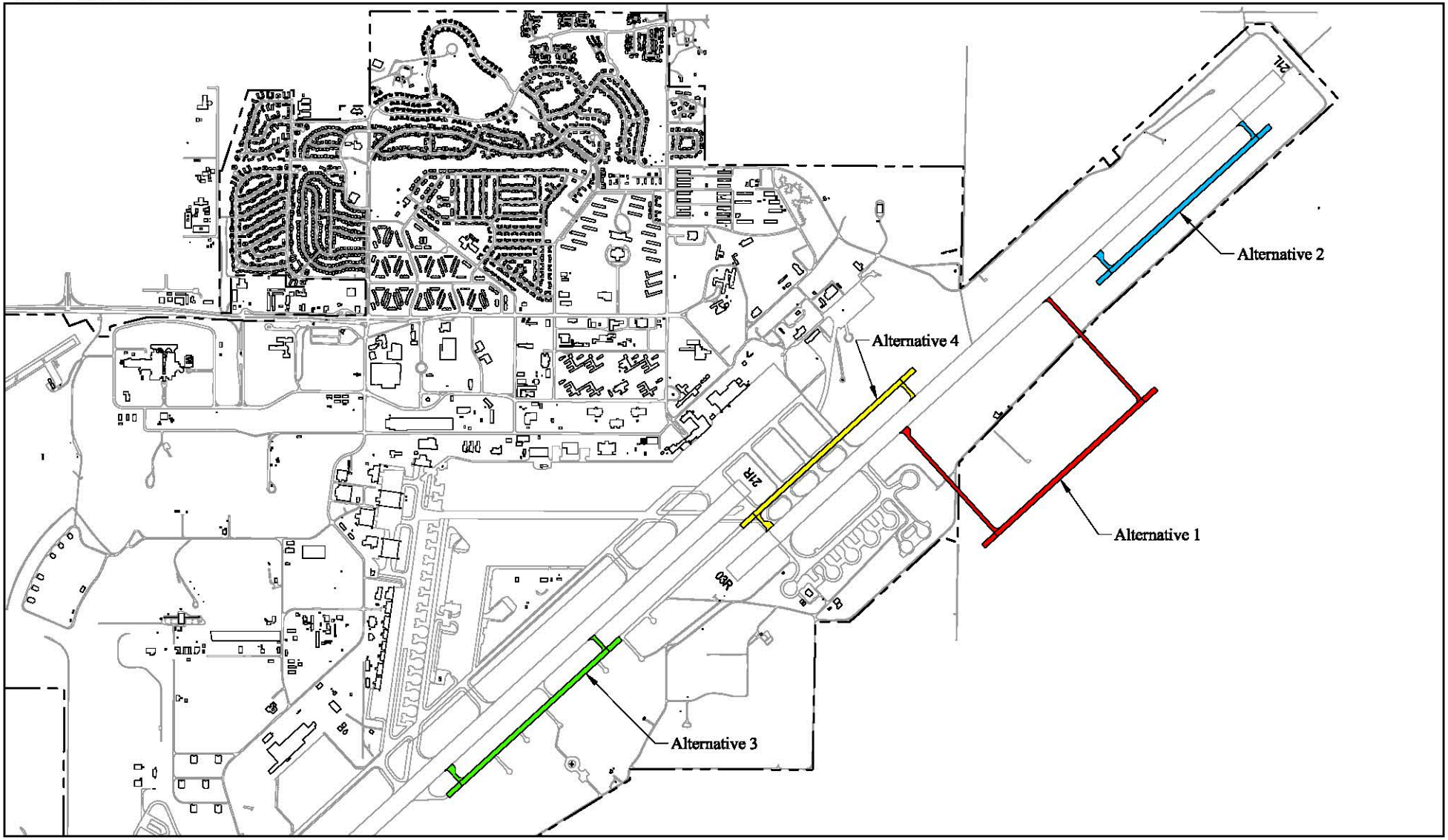
2.1.3.1 Application of Selection Standards to the Installation Alternatives Considered

The following discussion explains how the selection standards were applied to eliminate installations not considered "reasonable" from detailed analysis.

No Action Alternative

The Air Force EIAP (32 CFR 989.8(d)) states: "Except in those rare instances where excused by law, the Air Force must always consider and assess the environmental impacts of the 'no action' alternative." Thus, the alternative of not constructing or establishing an LZ and conducting aircraft operations at the LZ was also identified (No Action Alternative) and will be analyzed in detail in the EA.

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Travis AFB

LEGEND

Installation Boundary

Note:
Proposed LZ locations are approximate.

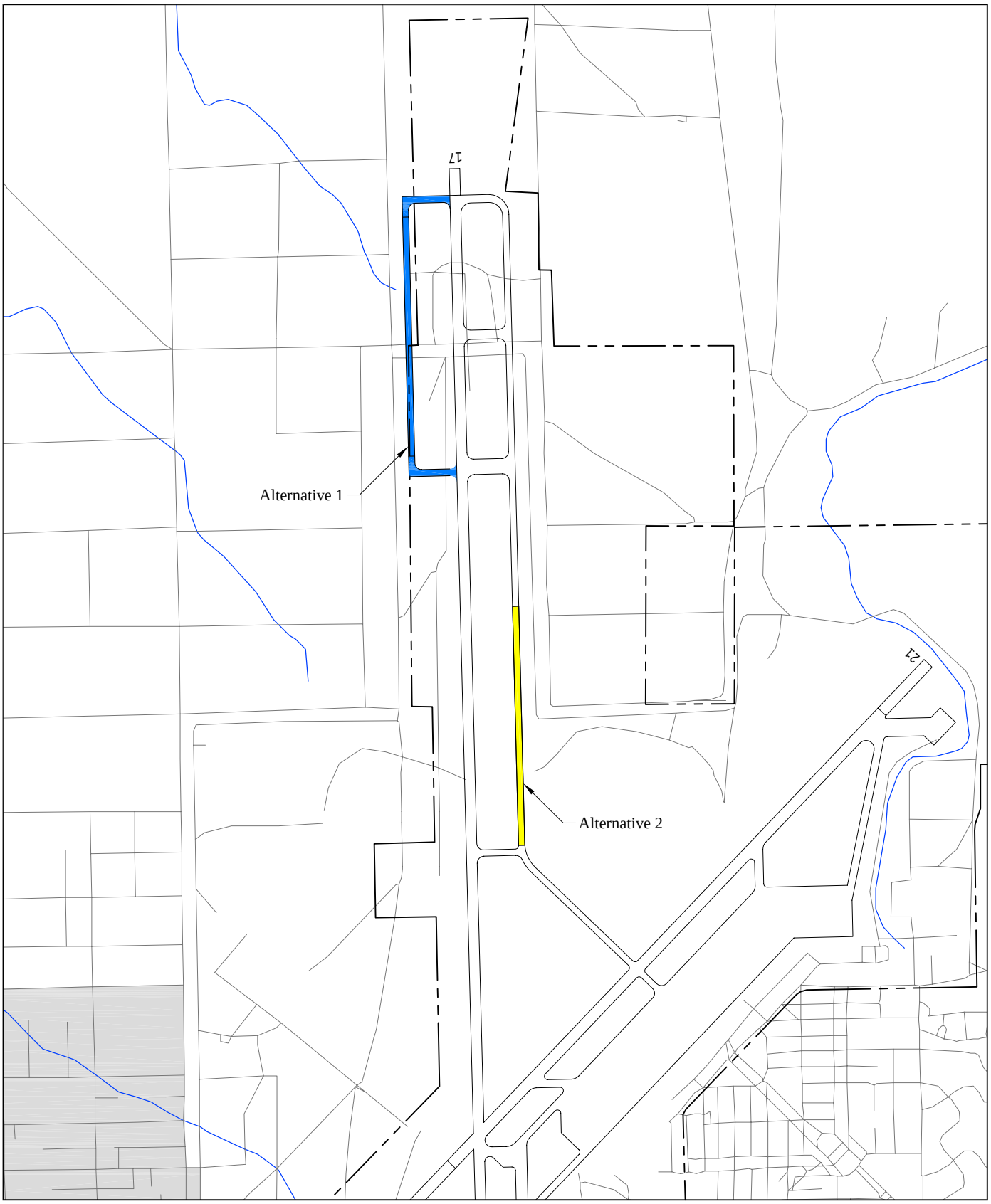
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Travis AFB Landing Zone Siting Alternatives

Figure 2-1

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Southern California Logistics Airport

LEGEND

Installation Boundary

N

0 2,000

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Note:
Proposed LZ locations are approximate.

Southern California Airport Landing Zone Siting Alternative

Figure 2-2

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Landing Zone Installation Alternatives Evaluation

The Air Force compared the 18 installations identified in Subchapter 2.1.2.1 with the selection standards in Subchapter 2.1.1.1. As a result of the process, the list of airfields was narrowed to the eight airfields listed in Table 2.1-2, and site visits and preliminary environmental assessments were accomplished for each airfield.

Table 2.1-2 Narrowed List of Potential Airfields for a Permanent Landing Zone in the Western United States

Site
Beale AFB
Crows Landing
Grant County Airport
NAS Lemoore
Plant 42
SCLA
Tonopah Test Range
Travis AFB

Source: USAF 2006.

Based on application of the information acquired during the site visits and preliminary environmental assessments to the selection standards, the Air Force further narrowed the potential sites for the LZ to the SCLA, Tonopah Test Range, the Grant County Airport, and Travis AFB. Further evaluation was accomplished, and Table 2.1-3 summarizes the results of the analysis.

Table 2.1-3 Comparison of Final Three Potential Airfields for a Permanent Landing Zone in the Western United States

Airfield	Airspace		NVG Environment	Existing Infrastructure	Weather	Operations Hours	Overall
	Scheduling	Training					
Tonopah Test Range	Yellow	Yellow/ Green	Green	Green	Green	Yellow	Yellow
SCLA	Green	Yellow	Yellow	Green	Green	Green	Yellow/ Green
Grant County Airport	Yellow	Green	Green	Green	Yellow	Green	Green
Travis AFB	Green	Green	Green	Green	Green	Green	Green

Source: USAF 2006.

The Air Force EIAP (32 CFR 989.8(b)) states: "…Reasonable alternatives are those that meet the underlying purpose and need for the proposed action…." The guidance also states: "If the Air Force identifies a large number of reasonable alternatives, it may limit alternatives selected for detailed environmental analysis to a reasonable range or to a reasonable number of examples covering the full spectrum of alternatives." Based on this guidance and the alternatives evaluation process outlined in the preceding

paragraphs, the Air Force decided that, rather than accomplishing all LZ operations at only one airfield, various combinations of operations at the Grant County Airport, Travis AFB, and the SCLA will be considered for the Proposed Action and alternative actions.

2.1.3.2 Application of Selection Standards to the Siting Alternatives Considered

Selection of a site on the Grant County Airport is not necessary because the airfield has an existing LZ.

Travis AFB

The Air Force compared the four potential sites identified in Subchapter 2.1.2.2 with the selection standards in Subchapter 2.1.1.2. The following paragraphs summarize the comparison process.

- Alternative 1: This alternative requires land acquisition. Approximately 250 acres of environmentally sensitive land would be affected. The distance (2,500 feet) between the LZ and Runway 21L/03R would allow simultaneous operations on the two runways.
- Alternative 2: Approximately 58 acres of environmentally sensitive land would be affected. The short distance (350 feet) between the LZ and Runway 21L/03R would preclude simultaneous operations on the LZ and the runway. However, the airfield has the capacity to accommodate the increase in operations even when the two runways are considered as one for air traffic control purposes.
- Alternative 3: The LZ would be about 300 from Runway 21R/03L. Additionally, the LZ would be nearly on an extension of the Runway 21L/03R centerline, about 3,000 feet from the southwestern end of the runway. Operations on Runway 21R/03L would be discontinued when operations are being accomplished on the LZ. The proximity of the LZ to the main portion of Travis AFB and the aircraft parking ramp degrade the NVG and tactical training environment.
- Alternative 4: The LZ would be constructed between the northeast end of Runways 21R/03L and the southwest end of Runway 21L/03R. The approximate 600 feet distance between the LZ and each runway would preclude simultaneous operations on the LZ and Runways 21R/03L and 21L/03R. The proximity of the LZ to the main portion of Travis AFB and the aircraft parking ramp degrade the NVG and tactical training environment.

Based on the alternatives evaluation and elimination process, the preferred site for the LZ at Travis AFB would be Alternative 2 (construct the LZ 350 feet east of Runway 21L/03R). Although approximately 58 acres of environmentally sensitive land would be affected and the proximity of the LZ to Runway 21L/03R would preclude simultaneous operations on the LZ and the runway, land acquisition would not be necessary and this alternative has fewer environmental and airfield operation impacts than the other three LZ site alternatives.

Southern California Logistics Airport

The Air Force and SCLA Manager compared the two potential sites identified in Subchapter 2.1.2.2 with the selection standards in Subchapter 2.1.1.2. The following paragraphs summarize the comparison process.

- Alternative 1: This alternative requires land acquisition. Approximately 37 acres of land that possibly has one federally listed endangered species, or would provide habitat for the species, would be affected. The distance (700 feet) between the LZ and Runway 17/35 would allow simultaneous visual flight rule (VFR) operations on the two runways.
- Alternative 2: The distance (700 feet) between the LZ and Runway 17/35 would allow simultaneous VFR operations on the two runways. Although simultaneous operations would be possible, this site for the LZ would produce a condition in which a greater number of the C-17 flight tracks would overfly the aircraft parking areas and Runway 03/21.

Based on the alternatives evaluation and elimination process and consultation with the SCLA Manager, the preferred site for the LZ at the SCLA would be Alternative 1 (construct the LZ 700 feet west of Runway 17/35).

2.2 DESCRIPTION OF PROPOSED ALTERNATIVES

2.2.1 No Action Alternative

Under the No Action Alternative, HQ AMC would not construct or establish a permanent LZ in the western United States closer to Travis AFB than the Grant County Airport. Airfield operations at Travis AFB, the SCLA, and the Grant County Airport would continue at the baseline levels. Tables 2.2-1, 2.2-2, 2.2-3 list the baseline aircraft operations at the three airfields.

Table 2.2-1 Annual and Average Daily Airfield Operations, Travis AFB Baseline

Aircraft	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
	Annual	Avg. Daily	Annual	Avg. Daily	Annual	Avg. Daily
C-17	2,184	6.17	4,807	13.73	6,991	19.90
C-5	1,642	4.50	15,159	51.39	16,801	55.89
KC-10	5,439	14.90	26,450	89.66	31,889	104.56
Navy E-6	1,236	3.38	3,066	8.40	4,302	11.78
Coast Guard C-130	1,356	3.72	2,172	7.43	3,528	11.15
subtotal	11,857	32.67	51,645	170.61	63,511	203.28
Transient	5,644	15.45	1,124	3.08	6,768	18.53
Total	17,501	48.12	52,778	173.69	70,279	221.81

Note: Approximately 14 percent of the operations occur during the evening (7:00 p.m. to 10:00 p.m.), while 11 percent occur during nighttime (10:00 p.m. to 7:00 a.m.).

Note: Operations reflect the end state aircraft operations condition at Travis AFB in the West Coast C-17 Basing EA.

Note: An airfield operation is the single movement or individual portion of a flight in the airfield airspace environment, such as one departure (takeoff), one arrival (landing), or one transit of the airport traffic area. The airfield airspace environment typically is referred to as the airspace allocated to the air traffic control tower and includes the airspace within an approximate 5-mile radius of the airfield and up to 2,500 feet above ground level. A low approach or a missed approach consists of two airfield operations (i.e., one arrival and one departure). A closed pattern consists of two airfield operations (i.e., one takeoff and one landing accomplished as a touch and go) and includes successive takeoffs and landings or low approaches where the aircraft does not exit the tower- or radar-controlled traffic pattern. The minimum number of airfield operations for one sortie is two operations, one takeoff (departure) and one landing (arrival).

USAF 2003a. Note: USAF 2003a contains operations for the Travis AFB Aero Club. These operations occurred on a runway about 2 miles west of the main airfield dedicated to the aero club aircraft. Aero club operations have been discontinued on Travis AFB and occur at an off-Base airfield. The data in this table have been adjusted to reflect discontinuation of aero club operations on Travis AFB.

Table 2.2-2 Annual and Average Daily Airfield Operations, Southern California Logistics Airport Baseline

Aircraft	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
	Annual	Avg. Daily	Annual	Avg. Daily	Annual	Avg. Daily
B-727	339	0.93	0	0.00	339	0.93
B-737	2448	0.68	0	0.00	248	0.68
B-747	245	.067	599	1.64	844	2.31
Bell 222	2,000	5.48	500	1.37	2,500	6.85
Beech Baron	3,843	10.53	7,534	20.64	11,377	31.17
C-17	770	2.11	1,201	3.29	1,971	5.40
Cessna Turboprop	142	0.39	2,190	6.00	2,332	6.39
DHC-6	1,102	3.02	1,164	3.19	2,266	6.21
Single Engine Fixed Pitch Propeller	1,205	3.30	11,304	30.97	12,509	34.27
Single Engine Variable Pitch Propeller	1,924	5.27	11,304	30.97	13,228	36.24
Gulfstream II	241	0.66	2,190	6.00	2,431	6.66
Gulfstream IV	172	0.47	2,190	6.00	2,362	6.47
Learjet 35	416	1.14	0	0.00	416	1.14
MD-83	391	1.07	0	0.00	391	1.07
UH-60	1,500	4.11	2,000	5.48	3,500	9.59
Total	14,538	39.83	42,176	115.55	56,714	155.38

Note: Approximately 8 percent of the total aircraft operations at the airfield occur during nighttime (10:00 p.m. to 7:00 a.m.).

Source: SCLA 2005.

Table 2.2-3 Annual and Average Daily Airfield Operations, Grant County Airport Baseline

Aircraft	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
	Annual	Avg. Daily	Annual	Avg. Daily	Annual	Avg. Daily
Air Carrier						
B-747	8,171	22.39	7,219	19.78	15,390	42.17
B-777	327	0.90	1,031	2.83	1,358	3.73
B-767	327	0.90	1,031	2.83	1,358	3.73
B-737	817	2.24	3,049	8.48	3,911	10.72
DC-9	817	2.24	3,049	8.48	3,911	10.72
Subtotal	10,459	28.67	15,470	42.40	25,929	71.07
Air Taxi						
C-208	4,367	11.96	1,031	2.83	5,398	14.79
General Aviation						
C-172	12,611	34.55	3,300	9.04	15,911	43.59
C-210	3,153	8.64	825	2.26	3,978	10.90
subtotal	15,764	43.19	4,125	11.30	19,889	54.49
Military						
C-17	7,667	21.00	17,033	46.67	24,700	67.67
P-3	885	2.42	1,965	5.38	2,850	7.80
EA-6B	295	0.81	655	1.79	950	2.60
Subtotal	8,846	24.23	19,654	53.84	28,500	78.07
Total	39,436	108.05	40,280	110.37	79,716	218.42

Note: Approximately 9 percent of the total aircraft operations at the airfield (all of which are C-17) occur during nighttime (10:00 p.m. to 7:00 a.m.).
Source: Grant County International Airport 2006.

Travis AFB is converting from 37 C-5 aircraft to 13 C-17 and 16 C-5 aircraft. The Base's inventory of 27 KC-10 aircraft will remain unchanged. Conversion will be complete in FY08 with the arrival of the 13th C-17 aircraft.

2.2.2 Proposed Action

An LZ would be constructed at Travis AFB to support tactical arrivals, departures, and landings. C-17s also would accomplish other training airfield operations on the two Travis AFB runways. Additionally, Travis AFB aircrews would accomplish operations on the existing LZ at the Grant County Airport (see Figure 2-3). It is estimated that construction of the LZ would begin in 2009 and be completed in one year or less, and that recurring aircraft operations would begin after the LZ is completed. Operations would begin at the Grant County Airport in 2008. No additional personnel would be assigned to Travis AFB or the Grant County Airport as a result of the action.

2.2.2.1 Airfield Operations

Tables 2.2-4 and 2.2-5, respectively list the projected annual and average daily airfield operations for Travis AFB and the Grant County Airport under the Proposed Action. Approximately 96 percent of the C-17 operations associated with the Proposed Action would be accomplished at Travis AFB, while 4 percent would be accomplished at the Grant County Airport.

Table 2.2-4 Annual and Average Daily Airfield Operations, Proposed Action at Travis AFB

Aircraft	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
	Annual	Avg. Daily	Annual	Avg. Daily	Annual	Avg. Daily
C-17 LZ Related Operations	819	2.28	7,350	20.41	8,169	22.69
C-130 LZ Related Operations	300	0.83	3,445	9.57	3,745	10.40
Based and Transient Aircraft	17,501	48.12	52,778	173.69	70,279	221.81
Total	18,620	51.23	63,573	203.67	82,193	254.90

Note: Table 2.2-1 lists the specific operations for the based and transient aircraft. C-17 and C-130 LZ related operations are based on 360 days per year. Approximately 11 percent of the operations associated with the Proposed Action at Travis AFB would occur during the evening (7:00 p.m. to 10:00 p.m.) and about 29 percent of the operations would occur during the nighttime (10:00 p.m. to 7:00 a.m.).

Table 2.2-5 Annual and Average Daily Airfield Operations, Proposed Action at Grant County Airport

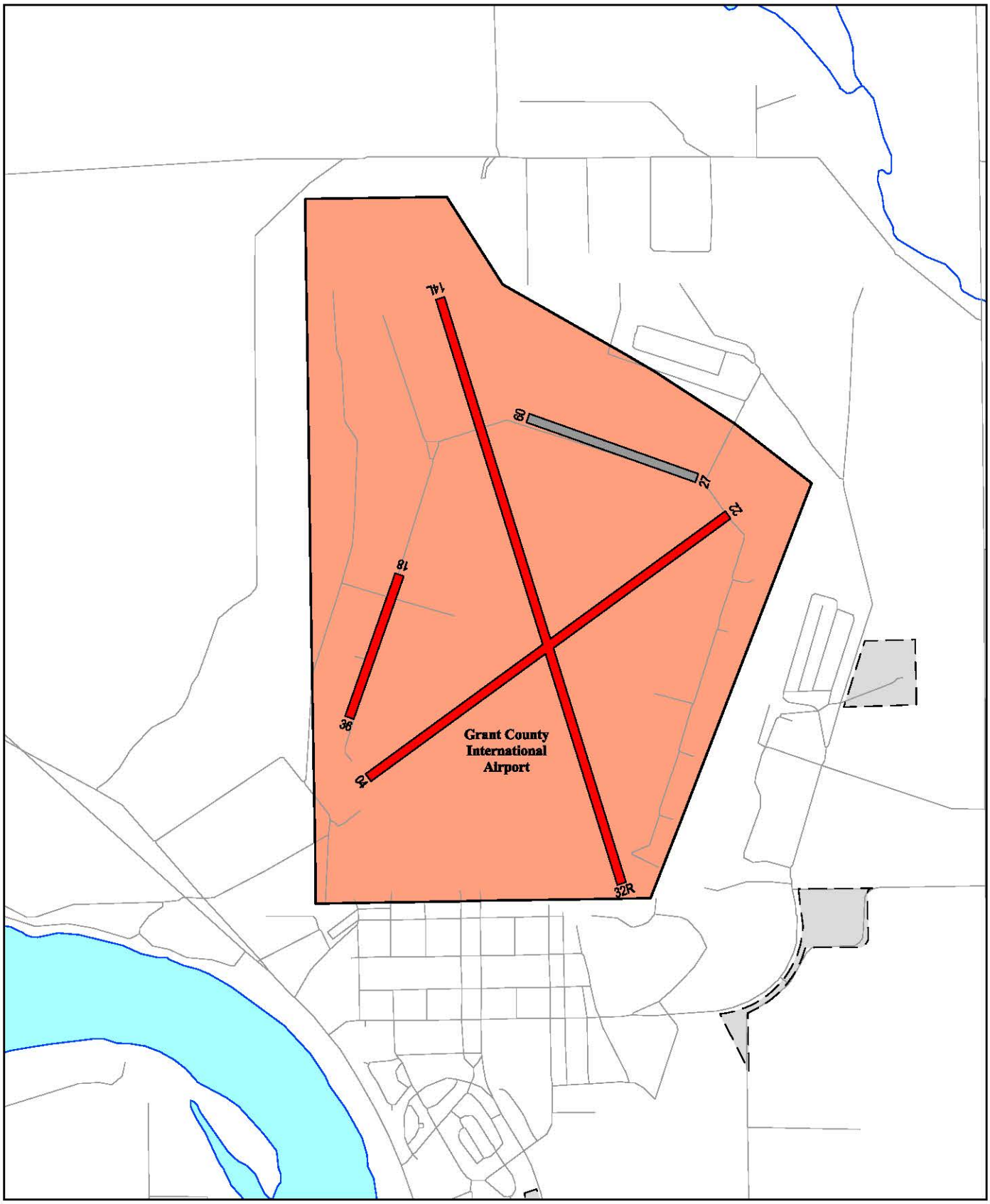
Aircraft	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
	Annual	Avg. Daily	Annual	Avg. Daily	Annual	Avg. Daily
C-17 LZ Related Operations	39	0.11	350	0.97	389	1.08
Other Aircraft	39,436	108.05	40,280	110.37	79,716	218.42
Total	39,475	108.16	40,630	111.34	80,105	219.50

Note: Table 2.2-3 lists the specific operations for the other aircraft. Approximately 10 percent (all of which are C-17) of the total aircraft operations at the airfield would occur during the nighttime (10:00 p.m. to 7:00 a.m.).

2.2.2.2 Landing Zone Construction

A 3,500-foot long, 90-foot wide LZ with 300-foot long overruns at each end and connecting taxiways would be constructed 350 feet east of the main instrument runway (Runway 21Left/03Right [21L/03R]) on existing Travis AFB property. Day/night LZ markings, and an IR lighting system for NVG operations would be installed. No construction would be required at the Grant County Airport because the airfield has an LZ.

Figure 2-4 depicts a conceptual siting for the LZ and Figure 2-5 details the LZ surface, shoulders, overruns, taxiways, and imaginary surfaces. Figure 2-6 identifies the proposed contractor haul route.



Grant County International Airport

LEGEND

Landing Zone Location

Roadway

Note:
Proposed LZ location is approximate.

N

0 3,000

Feet

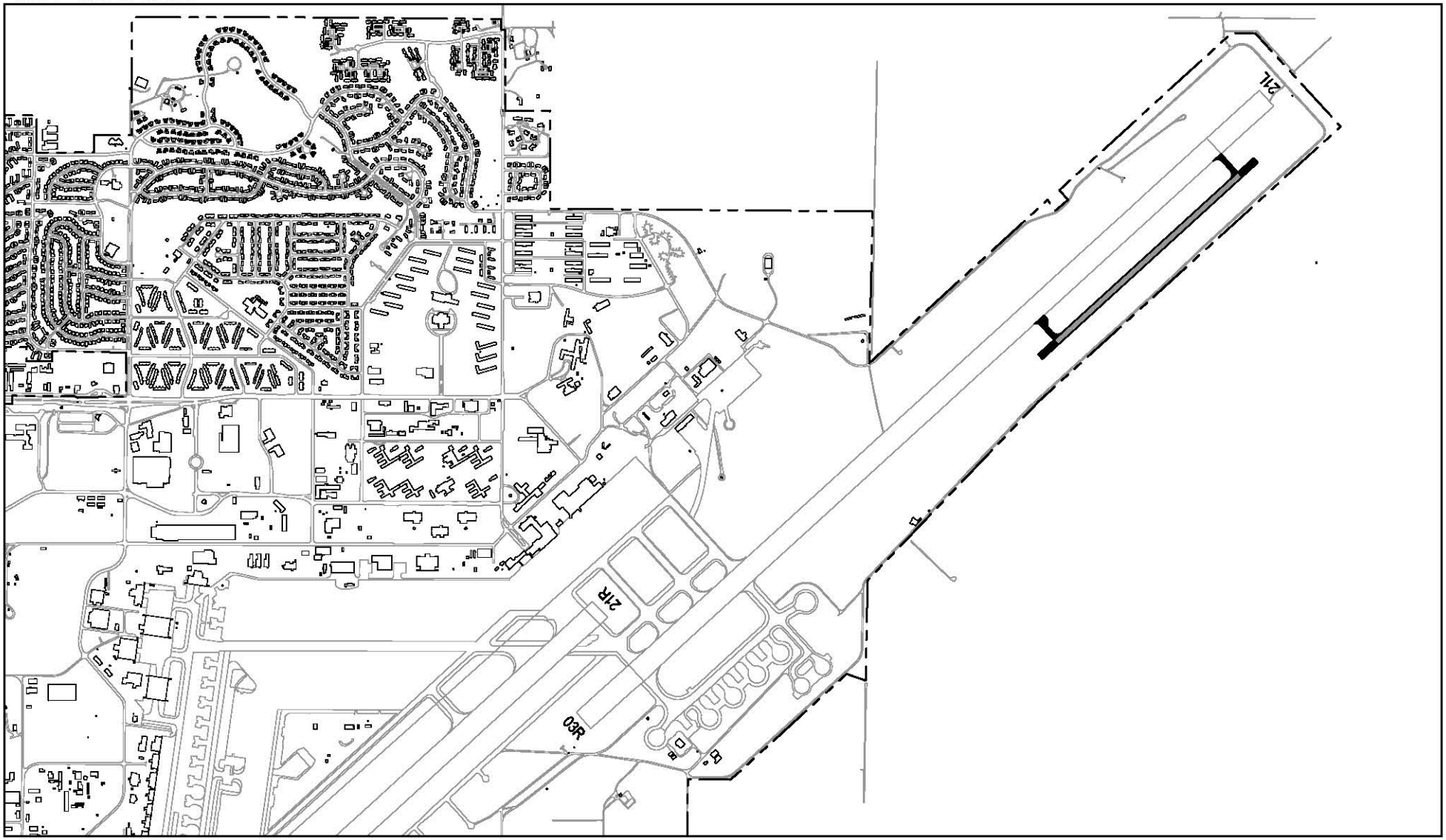
Landing Zone Location, Grant County Airport

Figure 2-3

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Travis AFB

LEGEND

Proposed Landing Zone Location

Installation Boundary

Note:
Proposed LZ location is approximate.

N

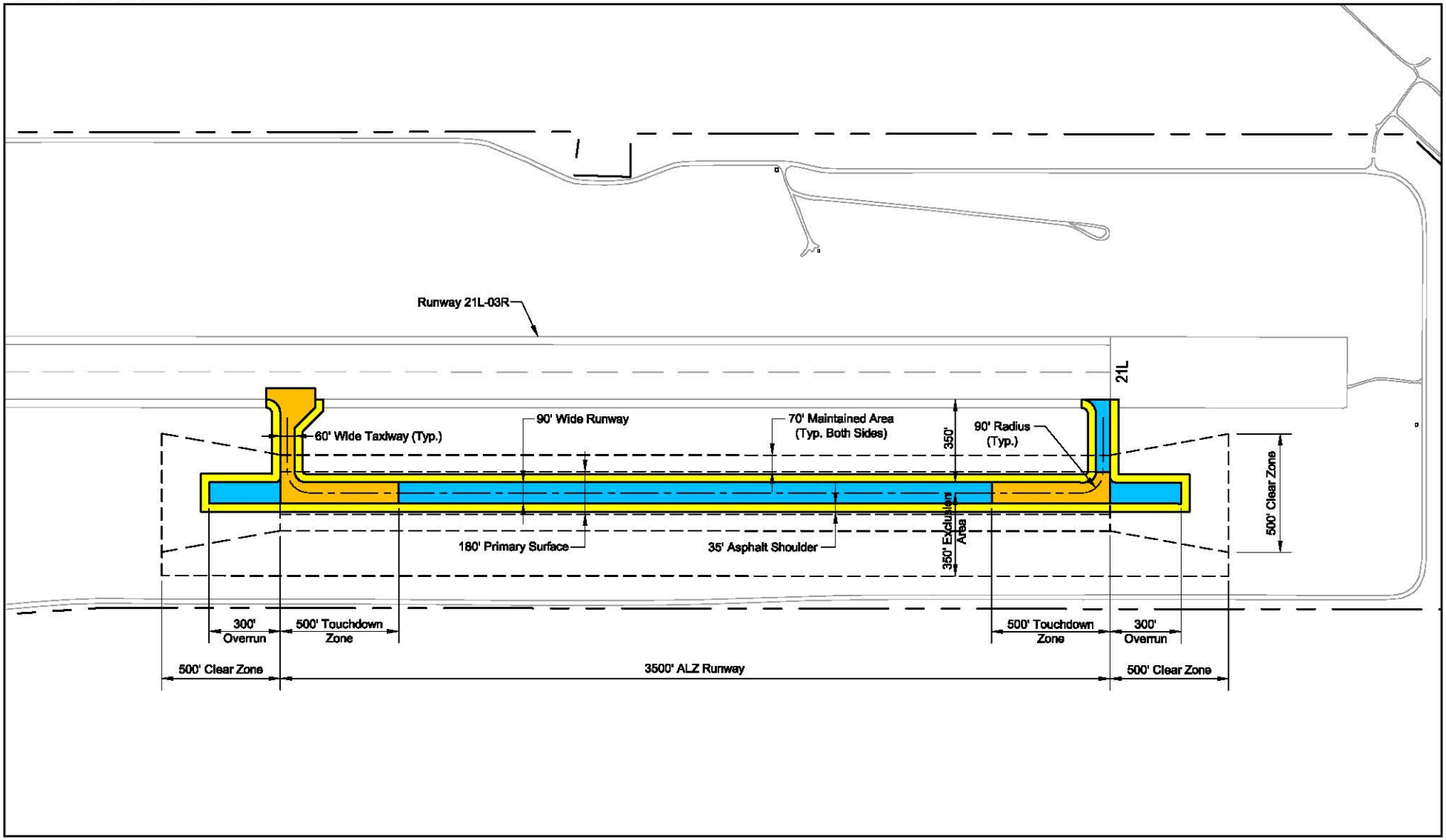
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Landing Zone Location, Proposed Action at Travis AFB

Figure 2-4

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Travis AFB

LEGEND

- Portland Cement Concrete Pavement
- Asphalt Concrete Pavement
- 35' Asphalt Concrete Shoulder

N

0 600

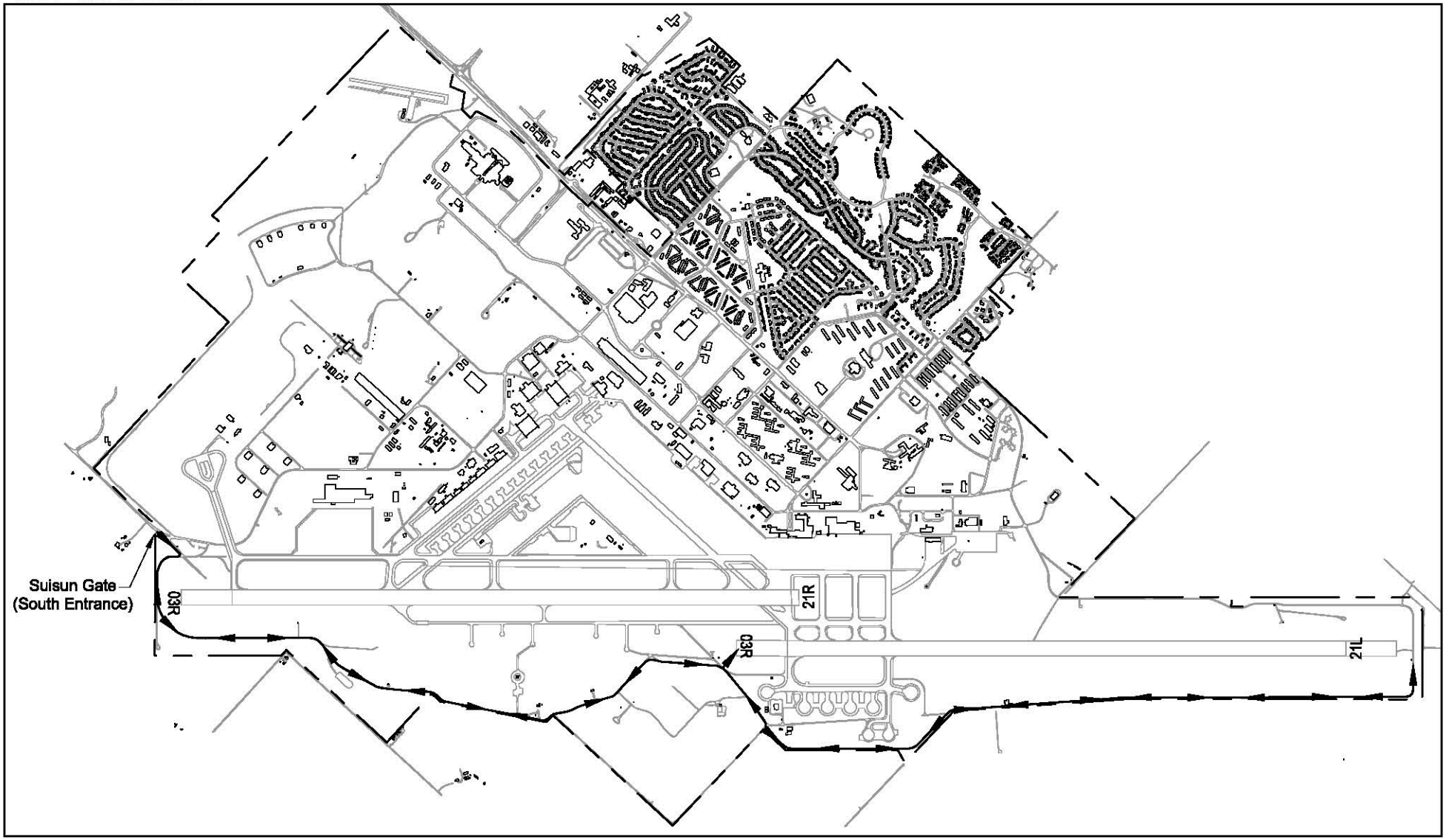
Feet

Landing Zone Detail, Proposed Action

Figure 2-5

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Travis AFB

LEGEND

Haul Route

N

0 2,800

Feet

Contractor Haul Route, Proposed Action

Figure 2-6

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The following conditions will be identified in the construction contract and would be adhered to by the contractor (CH2MHill 2007).

- The contractor shall store materials and equipment only in the designated staging areas or project area.
- All areas disturbed as a result of the contractor's staging and construction operations shall be restored to their original condition.
- The contractor shall not allow any men or equipment on any active airfield pavement, nor shall the contractor disrupt or hinder any traffic on any roadway within the limits of Travis AFB without written consent of the commander.
- The contractor will require special permission to work outside the hours between 7:00 a.m. and 5:00 p.m.
- Access and haul routes shall be established by the contractor and approved by the commander. Hauling operations shall take place on the existing airfield perimeter road (see Figure 2-6). The haul trucks must be covered at all times. A new haul road will be constructed to connect the existing perimeter road/haul route to the construction site.
- All deliveries to the project site shall be through the south gate at Travis AFB.
- Wetlands shall be identified by the contractor and protected prior to initiation of and during any construction activities.

It is estimated the concrete portion of the LZ will be about 17 inches thick with 15 inches of aggregate base. The asphalt portion of the LZ and the overruns and shoulders will be about 7 inches thick with 18 inches of aggregate base.

It is estimated that about 6,000 truck trips would be necessary to haul construction materials (*e.g*., cement, gravel for concrete, asphalt, *etc*.) to the construction site and from the batch plant to the LZ site. Altogether, trucks would travel about 43,000 miles to haul construction materials. Additionally, the batch plant and asphalt paver mixer would be operated about 109 and 148 hours, respectively, over the approximate 12-month construction period.

Imaginary surfaces for an exclusion area, clear zone (CZ), and accident potential zone (APZ) surfaces for a C-17 LZ in a built-up and occupied area would be established as defined in Air Force Engineering Technical Letter 04-7: *C-130 and C-17 Landing Zone (LZ) Dimensional, Marking, and Lighting Criteria*, March 29, 2004 (ETL 04-7) after completion of LZ construction.

Landing Zone Construction

The entire area between the proposed LZ and the existing Runway 21L/03R would be disturbed due to construction. The 58.5 acre LZ construction area includes: the 9.6-acre LZ, which includes connector taxiways at both ends of the new runway; 23.0 acres

of grading activities that extend 125 to 145 feet around the LZ perimeter; and 25.9 acres of land between Runway 21L/03R and the LZ that would be used for staging and other ground disturbance activities. The 9.6-acre runway will be the only new hardscape associated with the Landing Zone construction component.

The LZ would be raised and elevated 18 inches higher than the adjacent and existing Runway 03R-21L. The LZ would be designed to prevent any accumulation of rainwater. Stormwater runoff from the proposed runway would be collected and directed toward existing drainage features on the northeastern corner of Travis AFB. These drainage features also contain runoff from Runway 03R-21L which also is directed to Denverton Creek and then flows south beyond Travis AFB and on to the Wilcox Ranch.

The LZ would be constructed by first preparing the current site by trucking in and compacting new soil then grading the area to meet the required elevation for the new runway and taxiways, hauling in fill material to meet elevation requirements, compacting sub grade and finally placing concrete or asphalt. The equipment that would be used during construction includes dump trucks, graders, front end loaders, scrapers, and pavers.

Batch Plant Construction and Operation

The runway construction would require the temporary establishment of a batch plant to manufacture Portland cement concrete and asphalt cement. The 6.9-acre batch plant would include: a collection of silos containing fly ash, lime cement; sand and gravel material storage areas; a mixing plant; above ground storage tanks containing concrete additives and water; and designated areas for sand and gravel truck unloading, concrete truck loading, and concrete truck washout. The batch plant would be located on an improved surface within the previously developed areas of Travis AFB. The plant would be located away from watercourses and in an area that minimizes the potential for storm water run-off onto sensitive areas. When selected, the location would be provided to the USFWS for comment prior to its construction. Runoff from the paved and unpaved portions of the batch plant would be directed into a lined washout area, constructed catchment pond, or tanks. It is anticipated that the batch plant location would be selected no later than 30 days prior to the start of construction. The batch plant is designed as a temporary facility and would eventually be dismantled and removed from the selected location. Operation of the batch plant would require a National Pollution Discharge Elimination System permit as well as the implementation of Best Management Practices (BMP) and a SWPPP that would include a Sampling and Analysis Plan.

Staging and Hauling Operations

The existing Perimeter Road would be used as the contractor haul and access route. Perimeter Road follows the Travis AFB eastern boundary fence and parallels the existing flight line. Construction personnel would access the road at the Travis AFB South Entrance/Suisan Gate and follow Perimeter Road approximately 4.4 miles to where it would access the construction site via a new temporary access road. The temporary

access would require a new approximately 318-foot long and 15 foot wide, 0.11-acre access spur from Perimeter Road to the southwest corner of the proposed LZ construction site. The Air Force plans to construct this road to the existing topography, allowing surface flows to overtop the road. The road would be established with blading and compaction. The road surface would likely be topped with gravel. The road bed would not be raised and no fill will be used in its construction. The Air Force plans to restore the road following construction and within one year from the start of construction.

Material generated at the batch plant would be hauled to the construction area on existing paved roads within the base. All other equipment and storage and staging would occur within the area between the LZ and Runway 21L/03R.

Utility and Infrastructure Construction

Installation of the electrical systems including the runway lights and other utilities for the proposed LZ would be limited to the proposed and previously defined LZ. To supply electricity to the landing zone, new electrical cable would be pulled through an existing duct bank that runs along the south side of Runway 03R-21L. No overhead lighting would be installed.

2.2.2.3 Conservation and Minimization Measures

As defined in the Endangered Species Consultation Handbook for Section 7 consultation, conservation measures are actions to benefit or promote recovery of listed species included by the federal agency as an integral part of the proposed action. These actions are taken by the federal agency and serve to minimize or compensate for project effects on the species under review. These may include actions taken prior to the initiation of consultation or actions the federal agency has committed to complete in a BA or similar document (USFWS 1998).

The conservation measures developed by the Air Force and the USFWS, and described in this subchapter, are designed to compensate and minimize the potential impacts from construction and operation of the LZ to federal threatened and endangered (T&E) species resulting from the Proposed Action, specifically the California tiger salamander, Conservancy fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, Delta green ground beetle, and California Contra Costa goldfield. (The conservation measures are also included in the BA the Air Force completed for the Proposed Action and contained in Appendix D.)

Conservation and minimization measures are included as part of the Proposed Action to avoid and minimize adverse effects to listed species associated with the Proposed Action. Further, the conservation measures correspond to some recovery actions outlined in various USFWS recovery plans for listed species and vernal pool habitat.

Purchase of Compensation Credits and/or Purchase and Preseration of an Approved Parcel

To minimize the adverse effects of the Proposed Action at Travis AFB on the California tiger salamander the Air Force will protect a combined total of 105.3 acres of upland. This habitat compensation can be achieved by: 1) purchase of compensation credits at an existing USFWS-approved bank or banks, as appropriate for the species in Solano County; 2) or purchase and preservation of a USWFS-approved parcel and establishment of a conservation easement, development of a management plan, and provision of a perpetual endowment sufficient to cover management and maintenance of protected lands for the benefit and recovery of California tiger salamander); or 3) a combination of these two approaches. The Air Force will also restore 23.0 acres of disturbed upland within one year from the start of construction for tiger salamander upland dispersal habitat. Temporarily disturbed areas that are not restored within one year of construction will be considered permanently impacted by the USFWS.

Designation of the Resident Officer in Charge of Construction

The Resident Officer In Charge of Construction or the designee will be responsible for implementing the conservation measures and Terms and Conditions of the BO and shall be the point of contact for the project. The Resident Officer In Charge of Construction or the designee will maintain a copy of the BO onsite whenever construction is taking place. Their name and telephone number will be provided to the USFWS at least thirty (30) calendar days prior to groundbreaking at the project. Prior to ground breaking, the Resident Officer In Charge of Construction will submit a letter to the USFWS verifying that they posses a copy of the biological opinion and have read its Terms and Conditions.

Designation of the Project Biologist

A USFWS-approved biologist will be designated for the project. This qualified biologist(s) will be on-site during all activities that may result in the take of the California tiger salamander. The qualifications of the biologist(s) will be presented to the USFWS for review and written approval prior to ground-breaking at the project site. The biologist(s) will oversee implementation of all the conservation and minimization measures and Terms and Conditions in the BO. They shall have the authority to stop project activities, through communication with the Resident Engineer or the designee, if any of the requirements are not being fulfilled. If the biologist(s) exercises this authority, the USFWS and the California Department of Fish and Game (CDFG) will be notified by telephone and electronic mail within one working day.

Suspension of Construction Activities

The Resident Officer In Charge of Construction will halt work and immediately contact the USFWS-approved project biologist and the USFWS in the event that a California tiger salamander gains access to a construction zone. The Resident Officer In

Charge of Construction will suspend all construction activities in the immediate construction zone until the animal leaves the site voluntarily or is removed by the biologist to a release site using USFWS-approved transportation techniques.

Environmental Education for Construction Personnel

All construction personnel will attend an environmental education program delivered by the USFWS-approved biologist prior to working on the project site. The program will focus on how best to avoid take of California tiger salamander. The training session would be scheduled as a mandatory informational field meeting by the Resident Officer In Charge of Construction for contractors and all construction personnel and appropriate staff. The field meeting will include topics on species identification, life history, descriptions, and habitat requirements during various life stages. Emphasis will be placed on the importance of the habitat and life stage requirements within the context of the project area maps showing areas where minimization and avoidance measures are being implemented will be included as part of this education program. The program will include an explanation of appropriate federal and state laws protecting endangered species as well as the importance of compliance with various resource agency conditions.

Controls for Project Related Construction Vehicle Traffic

To minimize temporary disturbances, all project-related vehicle traffic will be restricted to established roads, construction areas, and other designated areas. These areas also will be included in pre-construction surveys and, to the maximum extent possible, will be established in locations disturbed by previous activities to prevent further adverse effects. Project-related vehicles will observe a 20-mile per hour speed limit within construction areas, except on local streets and state highways. This is particularly important at night when the California tiger salamander is most active. To the maximum extent possible, night-time construction will be minimized. Off-road traffic outside of designated project areas will be prohibited.

Project employees will be provided written guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.

Litter Control During Construction

To minimize attraction to predators all food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed at least once a day from the entire project site.

Control of Firearms in Construction Project Area

To avoid USFWS concern regarding possible injury or death of the California tiger salamander from firearms, the Air Force will continue the current practice of not allowing firearms on the project site except for those carried by authorized security personnel, or local, state, or federal law enforcement officials.

Control of Dogs and Cats in Project Area

To prevent harassment, injury or mortality of California tiger salamander or destruction of their burrows by dogs or cats, no canine or feline pets will be permitted in the action area.

Installation of Exclusion Fencing Around Work Area

The Air Force will install exclusion fencing for the California tiger salamander around any work area if necessary to continue construction activities outside the working window of April 16 to October 14. Exclusionary fencing will consist of taut silt fabric; 24 inches in height, staked at 10-foot intervals, with the bottom buried 6 inches below grade. Exclusion fencing will be maintained so that it is intact during rain events and 24 hours after any rain event, and will be routinely checked for integrity or potential entrapment.

Prevention of Encroachment into Sensitive Areas During Work Activities

The construction area will be delineated with high visibility temporary fencing at least four feet in height, flagging, or other barrier to prevent encroachment of construction personnel and equipment onto any sensitive areas during project work activities. Such fencing will be inspected and maintained daily by the on-site biologist until completion of the project. The fencing will be removed only when all construction equipment is removed from the site. Actions within the project area will be limited to vehicle and equipment operation on existing roads. No project activities will occur outside the delineated project construction area.

Inspection of Construction Activities by Regulatory Agencies

If requested, before, during, or upon completion of ground breaking and construction activities, the Air Force will allow access by USFWS and/or CDFG personnel to the project site to inspect project effects to the California tiger salamander and their habitats.

Pre-Construction Surveys of Construction Project Site

No more than thirty (30) calendar days prior to any ground disturbance, pre-construction surveys will be conducted by a USFWS-approved biologist for the California tiger salamander. These surveys will consist of walking surveys of the project limits and adjacent areas to determine presence of the species. The biologist will investigate all potential California tiger salamander cover sites. This includes full investigation of mammal burrows.

Monitoring of Initial Ground Disturbance Activities

A biologist will be onsite to monitor the initial ground disturbance activities. The biologist will perform a clearance survey immediately prior to the initial ground

disturbance. The biological monitor will also investigate areas of disturbed soil for signs of listed species within 30 minutes following the initial disturbance of that given area.

Preparation of Relocation Plan for California tiger salamanders

The Air Force will prepare a relocation plan for moving California tiger salamanders and submit it for USFWS approval at least 60 working days prior to the date of initial ground breaking. All California tiger salamanders encountered in the action area will be relocated to a USFWS-approved location. The relocation site will be approved prior to California tiger salamanders preconstruction surveys.

Capture and Handling of California tiger salamanders

Only USFWS-approved biologist(s) who are familiar with the biology and ecology of the California tiger salamander will capture or handle this species. USFWS-approved biologists will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two hours before and during periods when they are capturing and relocating tiger salamanders. To avoid transferring disease or pathogens between aquatic habitats during the course of surveys or handling of salamanders, USFWS-approved biologists will follow the Declining Amphibian Populations Task Force's "Code of Practice." USFWS-approved biologists will limit the duration of handling and captivity of tiger salamanders. While in captivity, individuals will be kept in a cool, moist, aerated environment, such as a bucket containing a damp sponge. Containers used for holding or transporting adults will not contain any standing water.

Prevention of Introduction of Amphibian Diseases to the Project Area

The biologist will take precautions to prevent introduction of amphibian diseases to the action area by disinfecting equipment and clothing as directed in the October 2003 California tiger salamander survey protocol entitled *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* and the recommended equipment decontamination procedures within the USFWS California Red-Legged Frog Survey Guidance. Disinfecting equipment and clothing is especially important when biologists are entering the action area to handle salamanders after working in other aquatic habitats.

Prevention of Inadvertent Entrapment of California tiger salamanders

To prevent inadvertent entrapment of California tiger salamanders during construction, all excavated, steep-walled holes or trenches more than 2 feet deep will be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they must be thoroughly inspected for trapped animals. If at any time a trapped listed animal is discovered, the on-site biologist will immediately place escape ramps or other appropriate structures to allow the animal to escape, or the

USFWS and/or CDFG will be contacted by telephone for guidance. The USFWS will be notified of the incident by telephone and electronic mail within one working day.

Use of Erosion Control Netting

Plastic mono-filament netting (erosion control matting) or similar material will not be used at the project site because the California tiger salamander may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

Regrading and Revegetating of Project Area

Upon completion of the proposed action, all California tiger salamander habitat subject to temporary ground disturbances along the C-17 landing zone perimeter and the access spur will be regraded, if appropriate, and revegetated with seeds and/or cuttings of appropriate plant species to promote restoration of the area to pre-project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the project, but that after project completion will not be subject to further disturbance and has the potential to be revegetated. The Air Force will submit to the USFWS the draft proposal for the restoration and revegetation plan at least sixty (60) calendar days prior to initial ground breaking; the final plan will be submitted for approval by the USFWS prior to ground breaking at the proposed project. To the maximum extent practicable (*i.e*., presence of natural lands), topsoil will be removed, cached, and returned to the site according to successful restoration protocols. Loss of soil from run-off or erosion will be prevented with straw bales, straw wattles, or similar means provided they do not entangle or block salamander escape or dispersal routes. The draft and final plan will contain specific quantifiable criteria to evaluate the success of the restoration. A biologist will ensure that areas subject to temporary disturbance have been adequately restored.

Care of California tiger salamanders Injured by Project Construction Activities

Injured California tiger salamanders will be cared for by a licensed veterinarian or other qualified person such as the on-site biologist; dead individuals will be preserved according to standard museum techniques and held in a secure location. The USFWS and the CDFG will be notified within one (1) working day of the discovery of death or injury to a California tiger salamander that occurs due to project related activities or is observed at the project site. Notification will include the date, time, and location of the incident or of the finding of a dead or injured animal clearly indicated on a United States Geological Survey 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information.

Post-Construction Compliance Report

The Air Force will submit a post-construction compliance report prepared by the on-site biologist to the USFWS Sacramento Fish and Wildlife Office within sixty calendar days following project completion or within sixty calendar days of any break in

construction activity lasting more than sixty calendar days. This report will detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting compensation and other conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the California tiger salamander, if any; (v) occurrences of incidental take; (vi) documentation of employee environmental education; and (vii) other pertinent information. The reports will be addressed to the Deputy Assistant Field Supervisor of the Endangered Species Program, Sacramento Fish and Wildlife Office.

Preparation and Implementation of an Erosion Control and Restoration Plan

The Air Force will prepare and implement an erosion control and restoration plan to control short-term and long-term erosion and sedimentation effects and to restore soils and vegetation in areas affected by construction activities. The plan will include all the necessary local jurisdiction requirements regarding erosion control and will implement BMPs for erosion and sediment control as required. Only appropriate native plant material will be used for erosion control and restoration.

Preparation, Submittal, and Implementation of Storm Water Pollution Prevention Plan

The Air Force will submit to the Regional Water Quality Control Board a notice of intent to discharge stormwater before construction and/or operation activities begin and will develop and implement a Storm Water Pollution Prevention Plan (SWPPP) as required by the conditions of a National Pollution Discharge Elimination System permit. The Air Force will prepare a SWPPP that identifies BMPs for discharges and groundwater disposal from dewatering operations associated with construction. The SWPPP will identify how and where these discharges would be disposed of during construction and operations. The SWPPP will include provisions for the following:

- Construction activities will be limited, such as to minimize the area of ground disturbance. No disturbance will be allowed outside the limits of applicable permits. Preservation of existing vegetation will be provided to the maximum extent possible. To minimize effects to California tiger salamander habitat, all required BMPs will be in place during the construction. Sensitive areas will be marked with high visibility fencing to clearly identify the construction area relative to sensitive areas.

- Installation of temporary erosion control devices will be an integral part of construction. Sedimentation fences will be used to contain polluted or turbid run-off from the work site. Other methods of temporary erosion control, including but not limited to hay bail check dams, will be employed to protect drainages, ephemeral pools, and all other areas susceptible to damage from run-off. Erosion control devices will be installed concurrently with construction earthwork.

- Excess materials from excavation activities will be hauled and disposed of at a permitted site. The disturbed right-of-way will be reseeded with the appropriate seed mixture. Spoils materials will not be placed in sensitive habitat areas, such as wetlands.

- Dedicated fueling areas and refueling practices will be designated. If possible, dedicated refueling areas will be located at least 200 feet from a drainage or wetland. Dedicated fueling areas will be protected from storm water run-on and run-off, and will be located at least 50 feet from downstream drainage facilities. Fueling will be performed on level-grade areas. On site fueling will only be used where it is impractical to send vehicles and equipment off site for fueling. When fueling must occur onsite, the contractor will designate an area to be used subject to approval of the Resident Officer In Charge of Construction. Drip pans or absorbent pads will be used during on-site vehicle and equipment fueling.

- All equipment will be maintained such that there will be no leaks of fluids such as gasoline, oils, or solvents.

- Spill control BMPs will be implemented anytime chemicals and/or hazardous substances are stored or used on the projects. Employees will be educated in proper material handling, spill prevention, and clean-up. Clean-up materials will be on-site and located near material storage and use.

- The temporary stockpiling of all materials will be located a minimum of 50 feet away from concentrated flows of storm water, drainage courses, and inlets. Stockpiles of "cold mix" asphalt materials will be placed on and covered with plastic or comparable material prior to the onset of precipitation. All other stockpiles will be covered, protected with soil stabilization measures, and a temporary perimeter sediment barrier, prior to the onset of precipitation.

- Erosion control devices will be monitored on a regular basis and augmented as necessary. In the event of pending storms, and in compliance with the SWPPP, erosion control devices will be inspected to ensure that such devices are in place and are functional. Monitoring and maintenance of erosion control devices and adjacent disturbed areas will continue during and immediately after significant storm events.

Effective Period for the Biological Opinion

Initiation of the construction is anticipated within 1 year from the date of issuance of the BO. Because of the potential for significant changes to the California tiger salamander species baseline before the completion of construction, the Air Force will

reinitiate formal consultation if construction of the C-17 LZ has not been completed within 3 calendar years from the date of issuance of the BO.

Vegetation Management in the Action Area

The Travis AFB INRMP is currently under revision (Williams 2007). The Travis AFB BASH Plan prescribes a vegetation management regime for vegetated areas surrounding runway surfaces, which maintains vegetation as homogeneously as possible. The 60th Operations Support Squadron/Airfield Management/Base Operations (60 OSS/OSAA) is responsible for ground maintenance of grass height between a minimum of 7 inches to a maximum of 14 inches to reduce attractiveness to wildlife/birds. The BASH Plan does not contain a mowing schedule; however, the BASH Plan mandates that grass should be cut before seed heads develop to avoid attracting grain-eating birds. Most of the grass genera in the action area are considered winter annuals (*Avena, Bromus, Hordeum, Vulpia*), which typically develop seed heads in the mid to late spring, and are fully mature by the onset of the dry season. Therefore, spring mowings are required in the BASH Plan. Stands of brush and shrubs are also removed.

The consultation and coordination process for preparation of the INRMP will include a review of BASH requirements and potential mowing scheduling modifications to reduce potential impacts to California tiger salamander upland habitat. Neither the vegetation height requirements nor mowing to reduce ground forage for birds (or mammals), as discussed in the BASH Plan, will be altered to maintain operational safety. Resource agency experts from the CDFG and USFWS may provide suggestions for the implementation of vegetation management strategies that 60 OSS/OSAA may implement if the strategies do not conflict with the BASH Plan.

Integrating Conservation Measures into Programmatic Agreements

Travis AFB is in the preliminary scoping stages for developing a California tiger salamander programmatic agreement with the USFWS Sacramento Ecological Services Field Office (Williams 2007). The conservation measures resulting from the consultation process will be integrated into the programmatic agreement to implement a comprehensive strategy for management of California tiger salamander populations and habitat on the Base. Other Base-wide natural resource planning documents (*e.g.*, the planned INRMP update) will include the conservation measures included in the BA the Air Force prepared for construction and operation of the LZ (see Appendix D).

2.2.2.4 Landing Zone Support

Travis AFB would support aircraft rescue and firefighting (ARFF) for the LZ in accordance with DoD Instruction 6055.6, *DoD Fire and Emergency Services Program*, which requires ARFF vehicles to respond to any incident on the runways or overruns within one minute after pre-positioning for an announced emergency and to any incident on the runways or overruns within three minutes for an unannounced emergency. Air

traffic control for C-17 LZ related operations would be provided by the Travis AFB air traffic control tower, which operates 24 hours per day, seven days per week.

Although the DoDI 6055.6 ARFF requirement does not apply to the Grant County Airport because it is not a military airfield, the airport meets the Federal Aviation Administration (FAA) ARFF response times, which are comparable to the DoDI standard. Air traffic control for C-17 LZ-related operations would be provided by the Grant County Airport air traffic control tower, which operates from 6:00 a.m. to 10:00 p.m., seven days per week.

Aircrews from Travis AFB would schedule operations at the Grant County Airport through McChord AFB. This would ensure compliance with the McChord AFB-Grant County Airport agreement that states the maximum number of C-17s operating at the airport would not exceed two aircraft and would not operate between 2:00 a.m. and 7:00 a.m. (Ryan 2007).

2.2.3 Southern California Logistics Airport Alternative

An LZ would be constructed at the SCLA to support tactical arrivals, departures, and landings. C-17s also would accomplish airfield operations on the SCLA runways. Additionally, Travis AFB aircrews would accomplish operations on an LZ that would be painted on Runway 21Left/03Right at Travis AFB and on the existing LZ at the Grant County Airport. Construction at the SCLA would begin in 2009 and be completed in one year or less, and airfield operations would begin when construction is completed. Operations would begin at Travis AFB and the Grant County Airport in 2008. No additional personnel would be assigned to the any of the three installations as a result of the action.

2.2.3.1 Airfield Operations

Tables 2.2-6, 2.2-7, and 2.2-8, respectively list the projected annual and average daily airfield operations for the SCLA, Travis AFB, and the Grant County Airport under the SCLA Alternative. Approximately 54 percent of the C-17 operations associated with the SCLA Alternative would be accomplished at the SCLA, 8 percent would occur at Travis AFB, and 38 percent would be accomplished at the Grant County Airport.

Table 2.2-6 Annual and Average Daily Airfield Operations at the Southern California Logistics Airport

Aircraft	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
	Annual	Avg. Daily	Annual	Avg. Daily	Annual	Avg. Daily
C-17 LZ Related Operations	429	1.20	3,850	10.69	4,279	11.89
C-130 LZ Related Operations	300	0.83	3,445	9.57	3,745	10.40
Other Aircraft	14,538	39.83	42,176	115.55	56,714	155.38
Total	15,267	41.86	49.471	135.81	64,738	177.67

Note: Table 2.2-2 lists the specific operations for the other aircraft. C-17 and C-130 LZ related operations based on 360 days per year. Approximately 11 percent of the operations associated with the SCLA Alternative at the SCLA would occur during the evening (7:00 p.m. to 10:00 p.m.) and about 29 percent of the operations would occur during the nighttime (10:00 p.m. to 7:00 a.m.).

Table 2.2-7 Annual and Average Daily Airfield Operations, Southern California Logistics Airport Alternative at Travis AFB

Aircraft	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
	Annual	Avg. Daily	Annual	Avg. Daily	Annual	Avg. Daily
C-17 LZ Related Operations	78	0.22	700	1.94	778	2.16
Based and Transient Aircraft	17,501	48.12	52,778	173.69	70,279	221.81
Total	17,579	48.34	53,478	175.63	71,057	223.97

Note: Table 2.2-1 lists the specific operations for the non-LZ operations by Travis AFB C-17, C-5, and KC-10 aircraft and other aircraft. C-17 LZ related operations are based on 360 days per year. Approximately 10 percent (all of which are C-17) of the total aircraft operations at the airfield would occur during the nighttime (10:00 p.m. to 7:00 a.m.).

Table 2.2-8 Annual and Average Daily Airfield Operations, Southern California Logistics Airport Alternative at Grant County Airport

Aircraft	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
	Annual	Avg. Daily	Annual	Avg. Daily	Annual	Avg. Daily
Interim C-17 LZ Related Operations	351	0.98	3,150	8.75	3,501	9.73
Other Aircraft	39,436	108.05	40,280	110.37	79,716	218.42
Total	39,787	109.03	43,430	119.12	83,217	228.15

Note: Table 2.2-3 lists the specific operations for the other aircraft. Approximately 10 percent (all of which are C-17) of the total aircraft operations at the airfield would occur during the nighttime (10:00 p.m. to 7:00 a.m.).

2.2.3.2 Landing Zone Construction

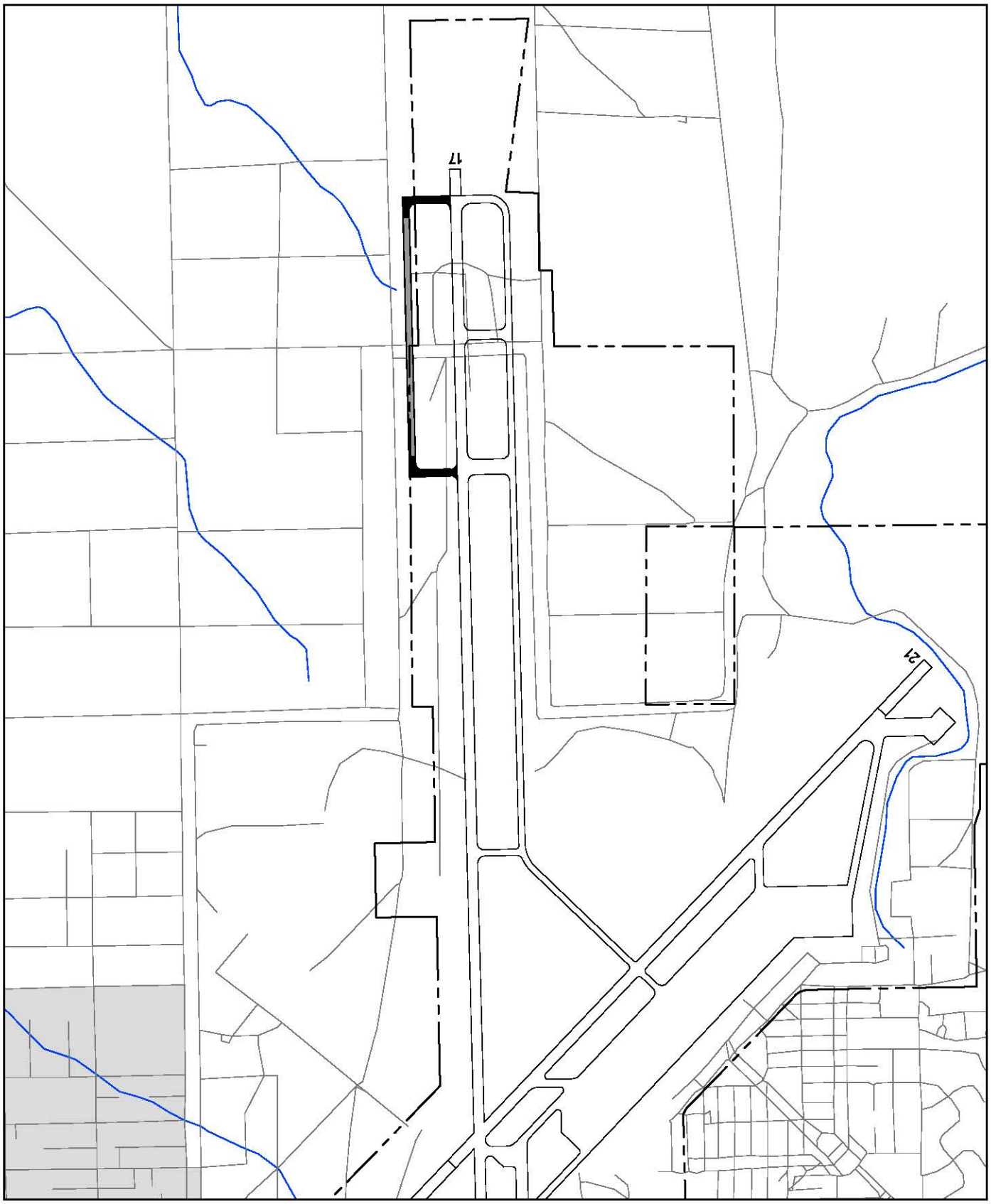
A 3,500-foot long, 90-foot wide LZ with 300-foot long overruns at each end and connecting taxiways would be constructed 700 feet west of the main instrument runway (Runway 17/35) (see Figure 2-7). Day/night LZ markings, and an IR lighting system for NVG operations would be installed. Figure 2-5 depicts the proposed location for the LZ. The LZ imaginary surfaces in ETL 04-7 would not be established because the SCLA is a civil airport and ETL criteria apply only to military airfields. However, the airport operator could establish similar imaginary surfaces using the guidance in Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*, which establishes civilian airport airspace imaginary surfaces in the space around airfields in relation to runways.

The LZ details (*i.e.*, width and length of LZ, width of shoulders, taxiways, and overruns) for the Proposed Action at Travis AFB also apply to the SCLA Alternative at the SCLA. It is estimated the construction contractor concept of operation (*i.e.*, location of batch plant on the installation, truck trips, batch plant operation, *etc*.) and the conditions identified for the Proposed Action at Travis AFB would also apply.

An LZ would not be constructed at Travis AFB. However, a 3,500-foot long, 90-foot wide LZ would be established by painting the LZ threshold and side boundaries in the middle of Runway 21Left/03Right. No construction would be required at the Grant County Airport because the airfield has an LZ (see Figure 2-3).

2.2.3.3 Conservation and Minimization Measures

The SCLA Alternative would require conservation measures similar to those for the Proposed Action at Travis AFB to avoid, minimize, or offset impacts to the desert tortoise, Mojave ground squirrel, and/or the burrowing owl (see Subchapter 2.2.2.3). The Air Force would conduct the necessary protocol surveys approved by the USFWS and/or CDFG to minimize impacts as appropriate. Conservation and minimization options could include purchasing credits through the Desert Tortoise Preserve Committee for assistance in land preserve acquisition or in-lieu fee payments to conservation organizations that manage for species of concern that could potentially be affected by the SCLA Alternative. Other conservation and minimization measures could be developed in consultation with the CDGF and the USFWS Carlsbad Ecological Services Field Office.



Southern California Logistics Airport

LEGEND

Proposed Landing Zone Location

Installation Boundary

N

0 2,000

Feet

Note:
Proposed LZ location is approximate.

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Landing Zone Location, Southern California Logistics Airport Alternative at Southern California Logistics Airport

Figure 2-7

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2.2.3.4 Landing Zone Support

Although the DoD Instruction 6055.6 ARFF requirement does not apply to the SCLA because it is not a military airfield, the airport meets the FAA's ARFF response times that are comparable to the DoD standard. Air traffic control for C-17 LZ related operations would be provided by the SCLA air traffic control tower, which operates from 6:00 a.m. to 10:00 p.m., seven days per week. The landing zone support information for Travis AFB and the Grant County Airport for the Proposed Action in Subchapter 2.2.2.4 also applies.

2.3 DESCRIPTION OF PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

The complete EIAP of the No Action Alternative and the proposed action must consider cumulative impacts due to other actions. 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 non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

The following subchapters describe the other actions that would occur at Travis AFB and the SCLA, and will be considered for cumulative impacts at the respective airfield. No other actions were identified for the Grant County Airport.

2.3.1 Travis AFB

Table 2.3-1 lists 10 other actions for Travis AFB that could occur during the same time period as the proposed Travis AFB LZ construction. Figure 2-8 depicts the locations of the other actions, and the following paragraphs contain brief descriptions of the projects.

C-17 Two-Bay Hangar. The hangar would accommodate two C-17 aircraft and would support heavy aircraft maintenance. The facility would have a high expansion foam fire extinguishing system in the maintenance bay area and a water sprinkler system in the administration area. The hangar would have a trench drain to accumulate spilled materials as well as high expansion foam and water fire suppression systems. A containment trench would be constructed to trap the high expansion foam should the chemical be released. The trapped high expansion foam would be pumped from the trench and disposed in accordance with applicable regulatory guidance. The wash down trench would have environmental control features to remove petroleum materials from wastewater prior to entry into a wastewater collection system (USAF 2003a).

Table 2.3-1 Information for Other Actions, Travis AFB

Project	Location Number	Construction (Square Feet)	Demolition (Square Feet)	Start Date (FY)	Duration (months)
C-17 Two-Bay Hangar	1	92,210	0	07	25 months
C-17 Addition and Alteration to Composite Shop	2	9,400	0	07	18 months
C-17 Wheel and Tire Shop	3	8,120	0	07	18 months
Addition and Alteration to Life Support Shop	4	3,800	0	08	8 months
Taxiway Lima Repairs	5	610,000	0	07	12 months
Road Adjustment	6	240,000	0	08	6 months
Construct Passenger Terminal	7	94,519	0	07	12 months
Base Civil Engineer Complex	8	118,877	0	08	12 months
Construct Fitness Center Addition	9	43,000	32,593	08	12 months
Repair Runway 21Right/03 Left Electrical Elements	10	NA	0	08	6 months
Total	**NA**	**1,219,926**	**32,593**	**NA**	**NA**

Note: Location number corresponds to project location on Figure 2-3. Size depicts total surface area for the facility. Start date reflected as FY. NA=not applicable.
Source: USAF 2003a.

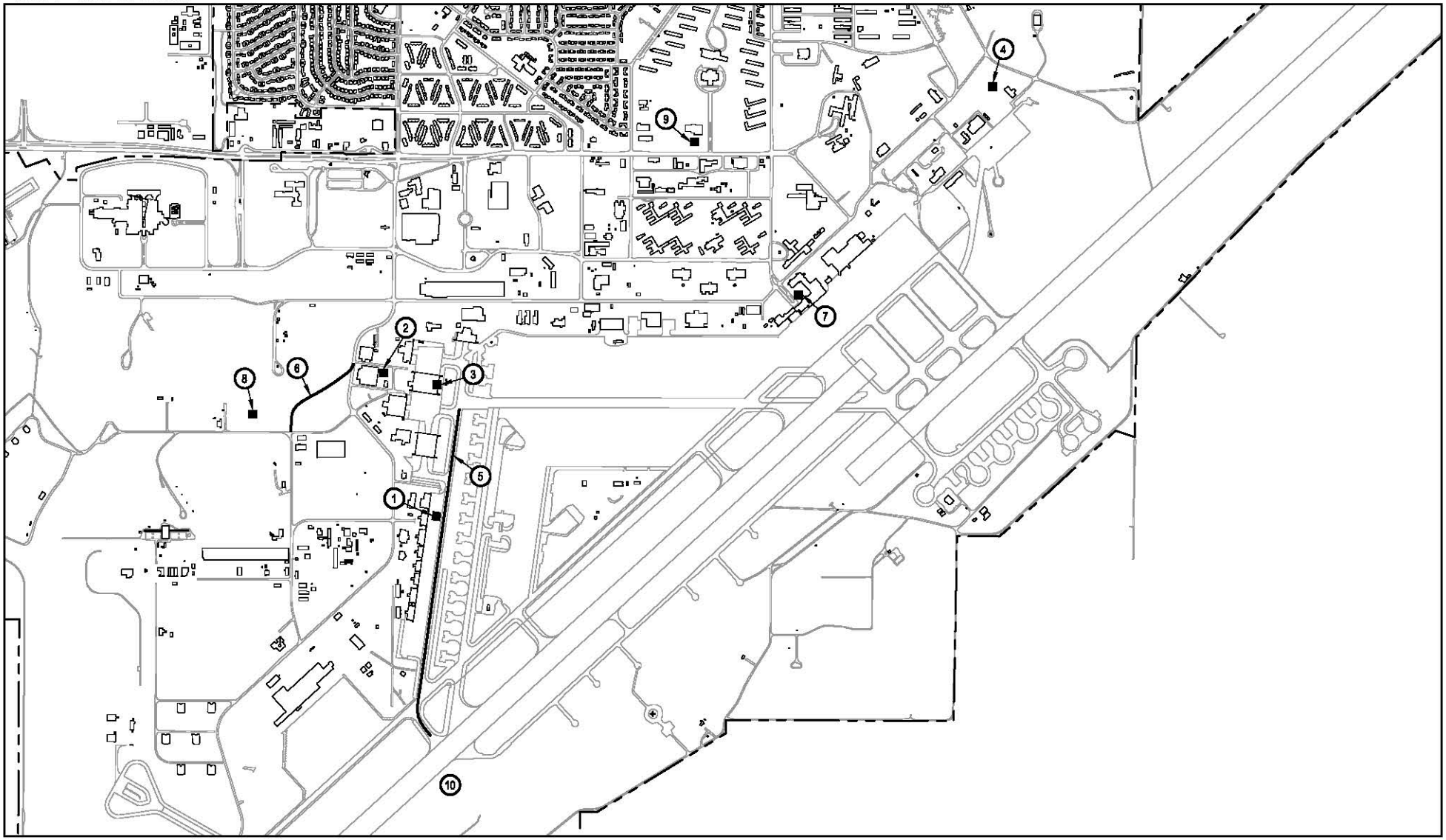
C-17 Addition and Alteration to Composite Shop. The facility would provide space for repair of composite (nonmetallic) materials, plastic carbon reinforced epoxy, honeycomb, and composite/metal-bonded material. The facility would have a triple dry filter system to reduce particulate matter emissions and a filter system to reduce emissions of volatile organic compounds (VOC) (USAF 2003a).

C-17 Wheel and Tire Shop. The facility would provide space for the maintenance and repair of aircraft landing gear wheel and tire assemblies as well as equipment storage. The wash down trench would have environmental control features to remove petroleum materials from wastewater prior to entry into a wastewater collection system. This facility would be constructed adjacent to Building 810 (USAF 2003a).

Addition and Alteration to Life Support Shop. This facility (Building 1212) would provide space for three functional activities: life support function office; aircrew training; and life support equipment maintenance and storage. The facility would have an explosives/flare storage vault and a battery/hazardous material waste safety venting area (USAF 2003a).

Taxiway Lima Repairs. Reconstruct Taxiway Lima to support C-17 aircraft (USAF 2003a).

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Travis AFB

LEGEND

1. Two-Bay Hangar
2. Addition and Alteration to Composite Shop
3. Wheel and Tire Shop
4. Addition and Alteration to Life Support Shop
5. Taxiway Lima Repairs
6. Road Adjustment Total
7. Passenger Terminal
8. Base Civil Engineer Complex
9. Fitness Center
10. Repair Runway 21 Right/03 Left

Note: Facility locations are approximate.

N

0 2,000

Feet

Location of Other Actions, Travis AFB

Figure 2-8

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Road Adjustment. A portion of Ragsdale Street would be adjusted. Additionally, other Base roads affected by C-17 construction would be repaired or reconstructed. Ragsdale Street would be realigned through an open grassed area containing two vernal pools that may support endangered species. The two vernal pools comprise a total of 0.515 acre that could be directly affected. Additionally, there is another 0.485 acre within the area around the project site (*i.e.*, 250 feet on either side of the proposed alignment) to consider for indirect adverse effects. To minimize or offset potential adverse effects to the vernal pools, the Air Force would purchase approximately 2.515 acres of conservation credit in a suitable conservation bank site approved by the USFWS (USAF 2003a).

Construct Passenger Terminal. This project would provide space for administration, seating, and other functions associated with handling passengers for those aircraft operations that transport passengers to or from Travis AFB (USAF 2003a).

Base Civil Engineering Complex. The multi-building complex would provide space for command, administration, operations center, resource flight, shop, warehouse, covered/sheltered storage, entomology, disaster preparedness training; prime Base engineer emergency force; air base operability; and readiness warehouse/mobility processing functions in a centralized civil engineering complex (USAF 2003a).

Construct Fitness Center Addition. This project would construct an addition to the existing physical fitness center to provide space for weight lifting, ergonometric training, men's and women's locker rooms/showers/latrines, outdoor 25-meter lap pool, bathhouse, and multi-purpose exercise training areas. This project would include all necessary and required work, including seismic work. This project includes demolition of a 32,593 square foot facility (USAF 2003a).

Repair Runway 21Right/03Left Electrical Elements. This project would replace deficient airfield lighting and markers and repair the existing runway (USAF 2003a).

2.3.2 Southern California Logistics Airport

Table 2.3-2 lists the three other SCLA projects that could occur during the same time period as the SCLA Alternative construction. The SCLA Manager does not anticipate a change in the number of airfield operations or the types of aircraft that operate at the airport in the foreseeable future. Figure 2-9 depicts the locations of the other actions, and the following paragraphs contain brief descriptions of the projects.

Construct Air Traffic Control Tower. This project would construct a new air traffic control tower that would have non-combustible walls and a thermal glass tower cab. The cab floor would be between 90 and 100 feet above ground level (AGL). To avoid obstructions to navigable airspace, the site for the new tower would comply with height restrictions for buildings on and around airports. The SCLA does not plan to demolish the existing air traffic control tower.

Table 2.3-2 Information for Other Actions, Southern California Logistics Airport

Project	Location Number	Construction (Square Feet)	Demolition (Square Feet)	Start Date (FY)	Duration (months)
Construct Air Traffic Control Tower	1	3,500	0	07	15
Repair Taxiway C and Main Aircraft Parking Apron	2	108,900	0	07	12
Extend Taxiway C	3	476,000	0	07	12
Total	**NA**	**588,400**	**0**	**NA**	**NA**

Note: Location number corresponds to project location on Figure 2-4. Size depicts total surface area for the facility. Start date reflected as FY. NA=not applicable. The construction size of the air traffic control tower reflects an estimated 3,000 square feet of interior space and 500 square feet for vehicle parking. The footprint of the facility is estimated to be 500 square feet.

Source: SCLA 2004.

Repair Taxiway C and the Main Aircraft Parking Apron. There are approximately 25 acres of surface associated with the area of Taxiway C and the main aircraft parking apron. However, the entire area would not be removed and replaced because repairs in the concrete portion would be limited to areas that are spalled, cracked, or require joint repair. Repair of the asphalt areas would involve crack filling, slurry sealing, and fog sealing. It is estimated that a maximum of 10 percent of the 25 acres of surface associated with the area of Taxiway C and the main aircraft parking apron (*i.e.*, 2.5 acres or 108,900 square feet) would be repaired.

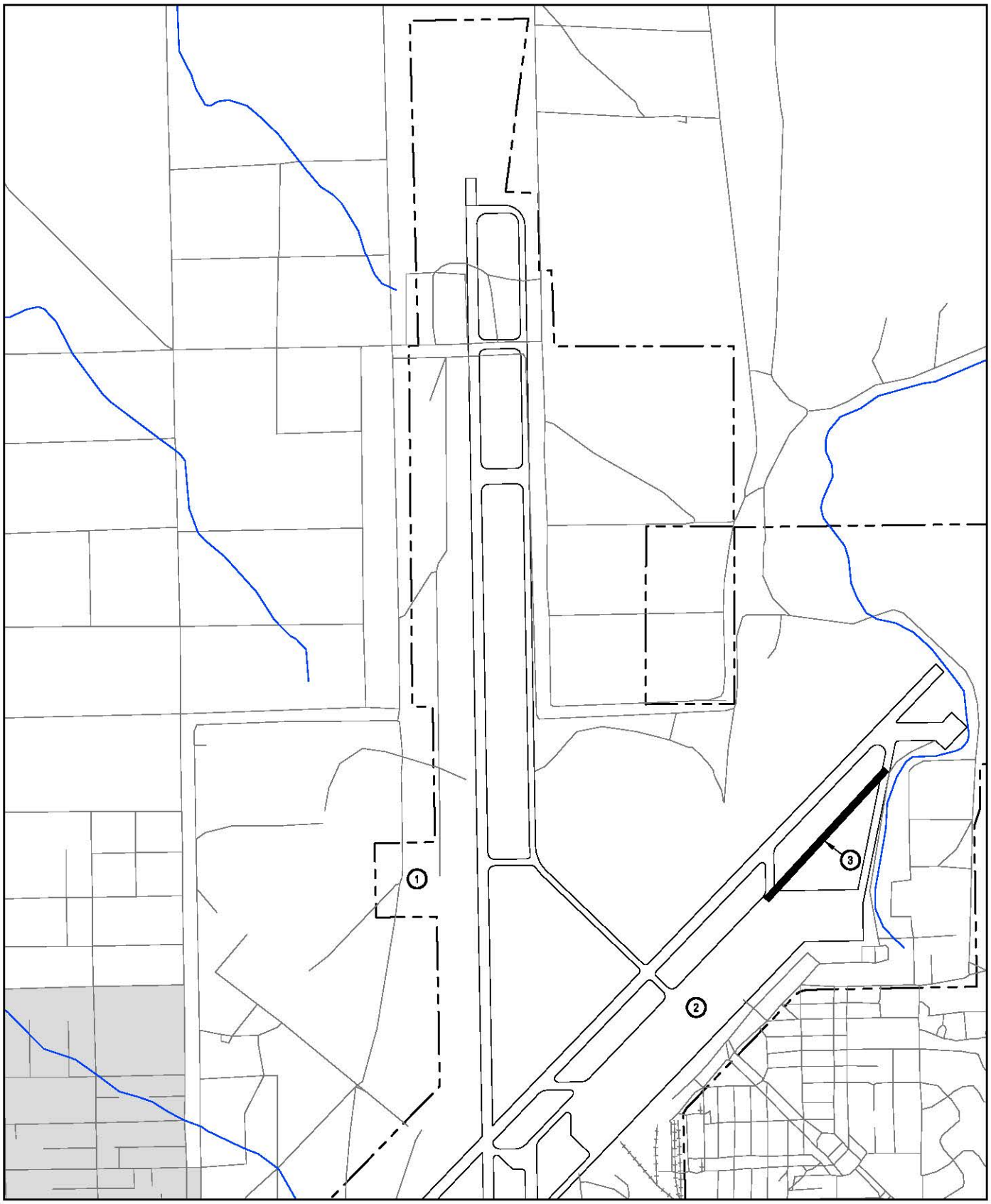
Extend Taxiway C. The extension would be approximately 2,800 feet long and 100 feet wide, with 35-foot wide paved shoulders.

2.4 IDENTIFICATION OF THE PREFERRED ALTERNATIVE

The Preferred Alternative is the Proposed Action, which includes constructing an LZ at Travis AFB and conducting about 96 percent of the proposed operations at the Base and 4 percent of the operations on the existing LZ at the Grant County Airport.

2.5 COMPARISON OF ENVIRONMENTAL EFFECTS OF ALL ALTERNATIVES

Table 2.5-1 summarizes the impacts of the No Action Alternative, Proposed Action, and the SCLA Alternative. Table 2.5-2 summarizes the cumulative impacts. Cumulative impacts would not occur at the Grant County Airport because no other actions were identified.



Southern California Logistics Airport

LEGEND

1. Construct Air Traffic Control Tower
2. Repair Taxiway C and the Main Aircraft Parking Apron
3. Extend Taxiway C

Note:
Location of air traffic control tower and extend taxiway C are approximate.

N

0 2,000
Feet

Location of Other Actions, Southern California Logistics Airport

Figure 2-9

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Table 2.5-1 Summary of Environmental Impacts for a Permanent C-17 Landing Zone in the Western United States

Aircraft Operations, Aircraft Safety and Bird/Wildlife Aircraft Strike Hazard

No Action Alternative

- The air traffic control procedures, which accommodate the current level of activity, would continue to be used to control aircraft operations at Travis AFB, the SCLA, and the Grant County Airport.
- The potential for aircraft accidents or BASH incidents would remain at the baseline conditions at Travis AFB, the SCLA, and the Grant County Airport. The risk would continue to be low that an aircraft involved in an accident at or around any of the three airfields would strike a person or structure on the ground. Likewise, it would continue to be unlikely that any of the BASH incidents at or around any of the three airfields would involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

Proposed Action

Travis AFB

- The airfield has the capacity to accommodate the 15 percent increase in operations.
- The existing air traffic control procedures for the airspace surrounding and at the airfield would accommodate continued C-17 operations on the runways as well as the new aircraft ground tracks and operations on the LZ.
- The risk is low that an aircraft involved in an accident or BASH incident at or around the airfield would strike a person or structure on the ground.

Grant County Airport

- The airfield has the capacity to accommodate the less than 1 percent increase in operations.
- The existing air traffic control procedures for the airspace surrounding the airfield and at the airfield would accommodate the proposed C-17 operations at the airfield.
- The risk is low that an aircraft involved in an accident or a BASH incident at or around the airfield would strike a person or structure on the ground.

Southern California Logistics Airport Alternative

Southern California Logistics Airport

- The airfield has the capacity to accommodate the 14 percent increase in operations.
- The volumes of traffic in the airspaces at and surrounding the airport, in conjunction with the air traffic control procedures that would be developed to accommodate the C-17 operations, would not impair operations at the SCLA.
- The risk is low that an aircraft involved in an accident or a BASH incident at or around the airfield would strike a person or structure on the ground.

Travis AFB

- The airfield has the capacity to accommodate the 1 percent increase in operations.
- The existing air traffic control procedures for the airspace surrounding and at the airfield would accommodate continued C-17 operations on the runways as well as the new aircraft ground tracks and the operations on the LZ.
- The risk is low that an aircraft involved in an accident or a BASH incident at or around the airfield would strike a person or structure on the ground.

Grant County Airport

- The airfield has the capacity to accommodate the 4 percent increase in operations.
- The existing air traffic control procedures for the airspace surrounding the airfield and at the airfield would accommodate the proposed C-17 operations at the airfield.
- The risk is low that an aircraft involved in an accident or a BASH incident at or around the airfield would strike a person or structure on the ground.

Table 2.5-1 Summary of Environmental Impacts for a Permanent C-17 Landing Zone in the Western United States (*continued*)

Noise
No Action Alternative • The number of persons exposed to aircraft noise and potentially highly annoyed at Travis AFB, the SCLA, and Grant County Airport would remain at current levels and would continue to be below the level at which risk to the general population may occur. • The potential for persons to be awakened by aircraft noise would continue at the existing levels. • No structural damage would occur from aircraft noise at or around either of the airfields. **Proposed Action** **Travis AFB** • The 382 persons exposed to Community Noise Equivalent Level (CNEL) 60 decibels (dBA) and greater equate to about 1 percent of the persons who live within a 5-mile radius of the airfield, the same percentage of exposure as the No Action Alternative. • One additional person could be awakened by aircraft noise from operations occurring during the nighttime (10:00 p.m. to 7:00 a.m.). • Noise-induced hearing loss would not occur because individuals will not be exposed to noise for the duration at which loss could occur. • Noise from C-17 operations would remain below the level at which damage to structures occurs. Therefore, there would be no damage to structures from increased C-17 operations. • Construction noise would: (1) be temporary and occur only during the hours that construction and demolition activity would occur and would cease when the project is completed; and (2) likely not cause sleep interference. **Grant County Airport** • The 2,091 persons exposed to Day-Night Average Sound Level (DNL) 65 dBA and greater equate to about 17 percent of the persons who live within a 5-mile radius of the airfield, the same percentage of exposure as the No Action Alternative. • One additional person could be awakened by aircraft noise from operations occurring during the nighttime. • The summary for noise-induced hearing loss and structural damage for Travis AFB also applies. **Southern California Logistics Airport Alternative** **Southern California Logistics Airport** • The three persons exposed to CNEL 60 dBA and greater equate to less than 1 percent of the persons who live within a 5-mile radius of the airfield, a slight increase when compared to the No Action Alternative. • One person could be awakened by aircraft noise from operations occurring during the nighttime. • The summary for noise-induced hearing loss, structural damage, and construction noise for the Proposed Action at Travis AFB also applies. **Travis AFB** • The 381 persons exposed to CNEL 60 dBA and greater equate to about 1 percent of the persons who live within a 5-mile radius of the airfield, the same percentage of exposure as the No Action Alternative. • One additional person could be awakened by aircraft noise from operations occurring during the nighttime. • The summary for noise-induced hearing loss and structural damage for the Proposed Action at Travis AFB also applies. **Grant County Airport** • The 2,147 persons exposed to DNL 65 dBA and greater equate to about 17 percent of the persons who live within a 5-mile radius of the airfield, the same percentage of exposure as the No Action Alternative. • Five additional persons could be awakened by aircraft noise from operations occurring during the nighttime. • The summary for noise-induced hearing loss and structural damage for the Proposed Action at Travis AFB also applies.

Table 2.5-1 Summary of Environmental Impacts for a Permanent C-17 Landing Zone in the Western United States (*continued*)

Land Use
No Action Alternative • Continuation of current aircraft operations would be consistent with land use in the area on and surrounding Travis AFB, the SCLA, and the Grant County Airport. **Proposed Action** **Travis AFB** • In accordance with AICUZ program guidance, Travis AFB may provide the noise contours and the land use sections of the attached environmental assessment and any other relative data to local planning agencies to serve as an interim AICUZ report. • A full update to the Travis AFB AICUZ Report (to include the LZ airspace imaginary surfaces) would be provided to the community within one year of the completed mission change, funding and other constraints permitting. • The Proposed Action at Travis AFB would be consistent with county and community plans because the noise contours from the project activities would not extend outward from the runway as far as the contours used in the plans. **Grant County Airport** • Land use plans for the area surrounding the airport would not be affected. • The airport would not have to update or revise its Airport Master Plan. **Southern California Logistics Airport Alternative** **Southern California Logistics Airport** • Land uses in the area of increased exposure are primarily open and the increase in noise would not impact land uses. • The airport could update its Airport Master Plan to reflect the Federal Aviation Administration (FAA)-established airspace imaginary surfaces for the LZ and the noise contours resulting from the aircraft operations. • The City of Victorville could update its Comprehensive Airport Land Use Plan to reflect the changes to Safety Review Areas resulting from the construction of the LZ and the additional area exposed to CNEL 65 dBA. **Travis AFB** • The summary for the Proposed Action at Travis AFB also applies. **Grant County Airport** • The summary for the Proposed Action at the Grant County Airport also applies.
Air Quality
No Action Alternative • Emissions from aircraft operations would continue at the current rates and would not exceed air quality standards at Travis AFB, the SCLA, and the Grant County Airport. **Proposed Action** **Travis AFB** • The emissions from both short-term construction and recurring aircraft operations positively conform to the USEPA-approved SIP. • The greatest increase in emissions from recurring aircraft operations for any of the six criteria pollutants, when compared to the baseline emissions inventory, would be 0.752 percent for nitrogen oxides (NO_X). These emissions would not cause a violation of federal standards. • A General Conformity Rule Conformity Determination would not be required. **Grant County Airport** • The greatest increase in emissions from recurring aircraft operations for any of the six criteria pollutants, when compared to the baseline emissions inventory, would be 1.162 percent for NO_X. These emissions would not cause a violation of federal standards. • A General Conformity Rule Conformity Determination would not be required. **Southern California Logistics Airport Alternative** **Southern California Logistics Airport** • The greatest increase in emissions from recurring aircraft operations for any of the six criteria pollutants, when compared to the baseline emissions inventory, will be 0.228 percent for VOCs. These emissions will not cause a violation of federal standards. • A General Conformity Rule Conformity Determination would not be required.

Table 2.5-1 Summary of Environmental Impacts for a Permanent C-17 Landing Zone in the Western United States (*continued*)

Air Quality

Travis AFB

- The greatest increase in emissions from recurring aircraft operations for any of the six criteria pollutants, when compared to the baseline emissions inventory, will be 0.006 percent for NO_X. These emissions will not cause a violation of federal standards.
- A General Conformity Rule Conformity Determination would not be required.

Grant County Airport

- The greatest increase in emissions from recurring aircraft operations for any of the six criteria pollutants, when compared to the baseline emissions inventory, will be 1.242 percent for NOx. These emissions will not cause a violation of federal standards.
- A General Conformity Rule Conformity Determination would not be required.

Biological Resources

No Action Alternative

- The potential for adverse effects to biological resources on Travis AFB and at the SCLA would be minimized through the continued use of existing natural resources management plans.

Proposed Action

Travis AFB

- The Proposed Action may adversely affect the California tiger salamander by permanently removing 35.1 acres of upland habitat, and temporarily removing 23.0 acres of upland habitat. This removal would not represent an adverse modification of designated Critical Habitat essential for recovery of this species.
- Listed invertebrate animal species may be affected, but not adversely affected as a result of the indirect effects of the altered hydrological regime. The increase in impervious cover would increase the total volume of water leaving the Base and increase flow rates and velocity in Denverton Creek, which diffuses onto the Wilcox Ranch.
- The Contra Costa goldfield would not be adversely affected by the Proposed Action. Habitat for this species would be removed, but removal would not represent an adverse modification of habitat essential to the recovery of this species.
- Conservation and minimization measures that would reduce the adverse effects associated with California tiger salamander upland habitat removal are included as part of the Proposed Action at Travis AFB.
- Delineated wetlands within the action area total 4.10 acres. These wetland features include vernal pools, seasonal wetlands, and drainage ditches. A wetlands delineation of the project area was conducted in 2008 and verified by USACE regulatory personnel on April 16, 2008. Of the 4.10 acres delineated, 0.42 acre would be permanently removed and 1.09 acres would be temporarily removed. Further, indirect impacts due to increased surface flows and increased hydrological connectivity would be expected on- and off-Base down the slope gradient from the proposed LZ. Conservation and minimization measures for the unavoidable losses of jurisdictional waters of the United States are included as part of the Proposed Action at Travis AFB.

Grant County Airport

- There is no record of rare plants or high-quality ecosystems or listed species that occur at the airport.

Southern California Logistics Airport Alternative

Southern California Logistics Airport

- The SCLA is within the range of three special status species that may be affected by this alternative—the desert tortoise, the Mojave ground squirrel, and the burrowing owl. The CDFG has records of desert tortoise occurrence within the SCLA boundary; however, the distribution and life history requirements for this species coupled with the prior land use practices decreases the suitability of the desert tortoise habitat within the SCLA. The Mojave ground squirrel also has potential to occur within the SCLA boundary; however, the SCLA LZ location does not contain alluvial fans or other landform features associated with the squirrel. The burrowing owl, a state species of concern, does occur within the SCLA boundary; however, there are no records of occurrence within the SCLA LZ site location although suitable habitat conditions are present.

Travis AFB

- No additional impervious cover would be needed (the LZ would be painted onto existing runways) which would cause direct and indirect effects to listed species; therefore, no special status species or habitat would be subject to impacts.

Grant County Airport

- There is no record of rare plants or high-quality ecosystems or listed species that occur at the airport.

Table 2.5-1 Summary of Environmental Impacts for a Permanent C-17 Landing Zone in the Western United States (*continued*)

Cultural Resources
No Action Alternative • No NRHP-eligible cultural resources have been identified at the Grant County Airport or the SCLA. NRHP-eligible resources at Travis AFB would continue to be managed under existing regulations and in accordance with procedures outlined in the Travis AFB Integrated Cultural Resources Management Plan. **Proposed Action** **Travis AFB** • No NRHP-eligible resources have been identified; therefore, the Proposed Action at Travis AFB would have no effect on cultural resources. **Grant County Airport** • No NRHP-eligible resources have been identified; therefore, the Proposed at the Grant County Airport would have no effect on cultural resources. **Southern California Logistics Airport Alternative** **Southern California Logistics Airport** • The summary for the Proposed Action at Travis AFB also applies. **Travis AFB** • No NRHP-eligible resources have been identified; therefore, the SCLA Alternative at Travis AFB would have no effect on cultural resources. **Grant County Airport** • No NRHP-eligible resources have been identified; therefore, the SCLA Alternative at the Grant County Airport would have no effect on cultural resources.

Table 2.5-2 Summary of Cumulative Impacts

Aircraft Operations, Aircraft Safety, and Bird/Wildlife Aircraft Strike Hazard
No Action Alternative • There would be no cumulative impacts because none of the other actions at Travis AFB or the SCLA include aircraft operations. **Proposed Action** • The summary for the No Action Alternative also applies. **Southern California Logistics Airport Alternative** • The summary for the No Action Alternative also applies for the SCLA and Travis AFB.
Noise
No Action Alternative • There would be no cumulative impacts for aircraft or construction noise because none of the other actions at Travis AFB or the SCLA include aircraft operations. No construction would occur at either installation under the No Action Alternative. **Proposed Action** • Based on the distance from the LZ construction site to the closest other action construction site, noise from LZ construction would attenuate to levels that, when combined with the noise from other action construction, would not produce cumulative impacts. There would be no cumulative impacts for aircraft noise because none of the other actions include aircraft operations. **Southern California Logistics Airport Alternative** • The summary for the Proposed Action also applies for the SCLA. There would be no construction noise cumulative impacts at Travis AFB because an LZ would not be constructed. Likewise, there would be no cumulative impacts for aircraft noise at the Base because none of the other actions include aircraft operations.

Table 2.5-2 Summary of Cumulative Impacts (*continued*)

Land Use
No Action Alternative • There would be no on-installation cumulative impacts because the LZ would not be constructed under the No Action Alternative at either Travis AFB or the SCLA. There would be no change in off-installation land use because there would be no additional aircraft operations that could change the noise exposure at either installation. **Proposed Action** • None of the other facilities would be constructed in the general area associated with LZ activities. **Southern California Logistics Airport Alternative** • The summary for the Proposed Action also applies for the SCLA and Travis AFB.
Air Quality
No Action Alternative • There would be no cumulative impacts because no construction emissions would be generated by the No Action Alternative at either Travis AFB or the SCLA. Emissions from aircraft operations would continue at baseline levels at each installation. **Proposed Action** • The net change in emissions for criteria pollutants from construction activities would not be regionally significant, and would not exceed *de minimis* thresholds. • No recurring aircraft operation emissions would be generated by the others actions and emissions from recurring aircraft operations do not violate air quality standards. **Southern California Logistics Airport Alternative** • **SCLA**. The summary for the Proposed Action also applies for the SCLA. **Travis AFB**. No cumulative construction emissions would occur because the LZ would not be constructed. No recurring aircraft operation emissions would be generated by the others actions and emissions from recurring aircraft operations do not violate air quality standards.
Biological Resources
No Action Alternative • There would be no cumulative impacts because the LZ would not be constructed under the No Action Alternative at either Travis AFB or the SCLA. **Proposed Action** • The potential for adverse effects to biological resources on Travis AFB would be minimized through the continued use of existing natural resources management plans. **Southern California Logistics Airport Alternative** • **SCLA**. The other projects considered for cumulative impact purposes would occur within developed, maintained areas with highly modified and disturbed landscape. There would be no cumulative disturbance of high quality and/or native vegetation within either the project or adjacent areas due to the alternative action and other projects at the SCLA. **Travis AFB**. The summary for the Proposed Action also applies.
Cultural Resources
No Action Alternative • There would be no cumulative impacts because the LZ would not be constructed under the No Action Alternative at either Travis AFB or the SCLA. **Proposed Action** • Because no NRHP eligible resources occur in the project area at Travis AFB, this project would not contribute to the cumulative impacts associated with other construction or alteration projects. **Southern California Logistics Airport Alternative** • **SCLA**. No NRHP eligible resources have been identified at SCLA, either within the current project area or any other future project areas. No cumulative impacts to cultural resources would occur. **Travis AFB**. The summary for the Proposed Action also applies.

2.6 MITIGATION AND CONSERVATION MEASURES

No mitigation would be required to reduce the impacts for: aircraft operations and safety and BASH; noise; land use; air quality; or cultural resources to less than significant.

The Air Force conducted Section 7 ESA consultation with the USFWS Sacramento Ecological Services Field Office for impacts of the Proposed Action at Travis AFB on special status species and habitats. The process is summarized in Subchapter 1.3 and Appendix D contains the BA and BO associated with the project as well as a summary of the history of consultation. Subchapter 2.2.2.3 details the conservation and minimization measures associated with the Proposed Action at Travis AFB.

As indicated in Subchapter 2.4, the Preferred Alternative is the Proposed Action. Should the Air Force choose the SCLA Alternative rather than the Proposed Action, three species of concern may be impacted. Selection of the SCLA Alternative would require conservation measures similar to those for the Proposed Action at Travis AFB to avoid, minimize, or offset impacts to the desert tortoise, Mojave ground squirrel, and/or the burrowing owl. The Air Force would conduct the necessary protocol surveys approved by the USFWS and/or CDFG to minimize impacts at the SCLA as appropriate. Conservation and minimization options could include purchasing credits through the Desert Tortoise Preserve Committee for assistance in land preserve acquisition or in-lieu fee payments to conservation organizations that manage for species of concern that could potentially be affected by the SCLA Alternative. Other conservation and minimization measures could be developed in consultation with the CDGF and the USFWS Carlsbad Ecological Services Field Office.

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CHAPTER 3
AFFECTED ENVIRONMENT

This chapter describes the existing environmental resources that could be affected by or could affect the No Action Alternative, Proposed Action, and the SCLA Alternative. Only those specific resources relevant to potential impacts are described in detail. As appropriate, the affected environment and environmental consequences of the Proposed Action and alternatives may be described in terms of site-specific descriptions or regional overview. For example, biological resources are defined by action area (*i.e.*, the area that would be disturbed due to LZ construction); cultural resources are described by the region of influence (ROI) (*i.e.*, areas subject to alternation and/or disturbance resulting from the LZ construction); and aircraft operations, noise, and air quality are based on a level of operations or activity.

3.1 TRAVIS AFB

3.1.1 Aircraft Operations, Aircraft Safety, and Bird/Wildlife-Aircraft Strike Hazard

3.1.1.1 Aircraft Operations

Airspace is a finite resource defined vertically, horizontally, and temporally. As such, it must be managed and used in a manner that best serves commercial, general, and military aviation needs. The FAA is responsible for overall management of airspace and has established different airspace designations to protect aircraft while operating to or from an airport, transiting enroute between airports, or operating within "special use" areas identified for defense-related purposes. Rules of flight and air traffic control procedures were established to govern how aircraft must operate within each type of designated airspace. The FARs apply to both civil and military aircraft operations unless the FAA grants the military service an exemption or a regulation specifically excludes military operations. All aircraft operate under either instrument flight rules (IFR) or VFR.

The Travis AFB Radar Approach Control (RAPCON) provides radar vectoring, sequencing, and separation service between participating VFR and all IFR aircraft operating within the airspace around the Base as well as to aircraft arriving and departing the Base. The actual airspace allocated to RAPCON is governed by the direction of traffic flow in the primary San Francisco Bay area airports and wind direction/velocity at Travis AFB. The airspace beginning about 20 miles south of Travis AFB contains a high volume of operations associated with arrivals and departures in the San Francisco-Oakland area. There are seven public and private use airports within the controlled airspace associated with Travis AFB. Six low-altitude federal airways pass within 20 miles of the Base. Low-altitude federal airways, defined from ground-based navigation aids, are used by civilian and military air traffic extending from 1,200 feet AGL up to, but not including 18,000 feet above mean sea level (MSL).

Travis AFB has two runways, 21Left/03Right and 21Right/03Left. Each runway is about 11,000 feet long and 300 feet wide. The airfield elevation is 62 feet above MSL and the air traffic control tower is operational 24 hours a day, seven days a week. There are seven instrument approaches available for arrivals to the airfield. Tower-controlled traffic patterns are flown on both sides of the runways at 1,000 feet AGL for rectangular patterns and 1,500 feet AGL for overhead patterns.

Flight patterns at airports and military airfields such as those being considered in this EA result from several considerations, including:

- Routing aircraft flight tracks to avoid noise-sensitive areas as much as possible;
- The safe operating parameters (*i.e.*, speed, rate of climb/descent, altitude, and turning radius) for each type of aircraft;
- Compliance with standards concerning the vertical and horizontal distance by which an aircraft must avoid structures and people;
- The efforts to control and schedule missions consistent with operational and training requirements to keep noise levels low, especially at night; and
- Coordination with the FAA to minimize conflict with other airports and airspaces in the area of the airfield.

The majority of aircraft operations at Travis AFB are generated by based C-17, C-5, KC-10, Navy E-6, and C-130 aircraft. Baseline C-17 operations at Travis AFB include closed pattern tactical maneuvers in which the aircraft spirals up and then spirals down to land and performs overhead patterns. Table 2.2-1 presents the average daily and total annual operations at Travis AFB. C-17s accomplish about 20 operations per day.

Air Force Handbook 32-1084, *Facility Requirements*, contains guidance for determining the type, size, and number of facilities a base needs to support its mission. Chapter 2 of the Handbook contains information for determining airfield requirements such as the number, width, and weight bearing capacity of runways, as well as guidance for aircraft parking aprons. The Handbook's airfield requirements planning process includes information for calculating the practical hourly capacity and practical annual capacity for the airfield. Based on information in the Handbook, it is estimated that the Travis AFB airfield has an annual capacity of 280,000 operations and an IFR hourly capacity of approximately 54 airfield operations. Assuming nearly all operations occur primarily between 6:00 a.m. and 2:00 a.m., there would be 20 hours of operations per day for hourly capacity purposes. The baseline annual 70,279 operations equate to about 25 percent of the annual airfield capacity. Based on a 20-hour day, the average hourly operations would be about 11 operations, or 21 percent of the hourly capacity.

3.1.1.2 Aircraft Safety

Areas around airports are exposed to the possibility of aircraft accidents, even with well-maintained aircraft and highly trained aircrews. Despite stringent maintenance

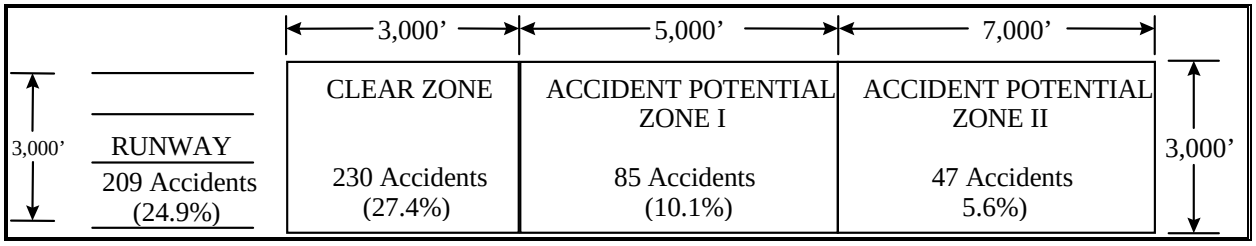
requirements and countless hours of training, past history makes it clear that accidents are going to occur.

The risk of people on the ground being killed or injured by aircraft accidents is miniscule. However, an aircraft accident is a high-consequence event and, when a crash does occur, the result is often catastrophic. Because of this, the Air Force does not attempt to base its safety standards on accident probabilities. Instead, the Air Force approaches safety from a land-use-planning perspective through its Air Installation Compatible Use Zone (AICUZ) program. Designation of safety zones around the airfield and restriction of incompatible land uses reduces the public's exposure to safety hazards.

The Air Force developed clear zones and accident potential zones at the ends of runways based on analysis of over 800 major Air Force accidents that occurred within 10 miles of Air Force installations between 1968 and 1995. The study found that 61 percent of the accidents were related to landing operations and 39 percent occurred during takeoff. Fighter and trainer aircraft accounted for 80 percent of the accidents, with large aircraft and helicopters accounting for the remaining 20 percent. Figure 3-1 depicts the three safety zones and summarizes the location of the accidents within a 10 nautical mile radius of the airfield. The following paragraphs define the CZ and APZs.

- Clear Zone Surface—The CZ width is 3,000 feet (1,500 feet to either side of runway centerline) and extends outward 3,000 feet. Some obstructions may occur within the CZ if permitted under AICUZ land use guidelines, or if appropriate authorities waive airfield planning guidance. Of the three zones (*i.e.*, CZ, APZ I, and APZ II, the CZ is the area with the greatest potential for an accident (see Figure 3-1).
- Accident Potential Zone Surfaces - APZ I begins at the outer end of the CZ and is 5,000 feet long and 3,000 feet wide. APZ II begins at the outer end of APZ I and is 7,000 feet long and 3,000 feet wide. APZ I has less accident potential than the CZ and APZ II has less potential than APZ I.

Figure 3-1 Air Force Aircraft Accident Data (838 Accidents - 1968-1995)



Other Accidents Within 10 nautical miles: 267 Accidents, 32.0%

The Air Force defines five categories of aircraft flight mishaps: Classes A, B, C, E, and High Accident Potential. Class A mishaps result in loss of life, permanent total disability, a total cost in excess of $1 million, destruction of an aircraft, or damage to an aircraft beyond economical repair. Class B mishaps result in total costs ranging between $200,000 and $1 million or result in permanent partial disability, but do not involve fatalities. Class C mishaps result in more than $100,000 (but less than $200,000) in total costs, or a loss of worker productivity exceeding eight hours. Class E mishaps represent minor incidents not meeting the criteria for Classes A through C. High Accident Potential events are significant occurrences with a high potential for causing injury, occupational illness, or damage if they occur and do not have a reportable mishap cost. Class C and E mishaps, the most common types of accidents, represent relatively unimportant incidents because they generally involve minor damages and injuries, and rarely affect property or the public.

Class A mishaps are the most serious of aircraft-related accidents and represent the category of mishap most likely to result in a crash. Table 3.1-1 lists the 10-year Class A mishap rates for the C-17 and C-130 aircraft. The table reflects the Air Force-wide data for all phases of flight of all missions and sorties for each aircraft.

Table 3.1-1 C-17 and C-130 Class A Aircraft Mishap Information

Aircraft	Class A Mishap Rate
C-17	1.22
C-130	0.42

Note: The mishap rate is an annual average based on the total number of Class A mishaps and 100,000 flying hours.

Source: USAF 2005.

3.1.1.3 Bird/Wildlife-Aircraft Strike Hazard

Bird and wildlife strikes by aircraft constitute a safety concern because of the potential for damage to aircraft, injury to aircrews, or local populations if an aircraft strike and subsequent aircraft accident should occur in a populated area. Aircraft may encounter birds at altitudes of 30,000 feet MSL or higher; however, most birds fly close to the ground. Over 95 percent of reported bird strikes occur below 3,000 feet AGL. Approximately 49 percent of bird strikes occur in the airport environment, and 15 percent during low-level cruise (USAF 2003b). Table 3.1-2 contains the distribution of Air Force bird/wildlife-aircraft strikes by altitude at airports. The data in the table would also apply to civil airports because the sizes and operating characteristics of civil aircraft are similar to Air Force aircraft. Historically, one-half of 1 percent of all reported bird/wildlife-aircraft strikes involving Air Force aircraft resulted in a serious mishap.

Table 3.1-2 Air Force Bird/Wildlife-Aircraft Strikes by Altitude at Airports

Altitude (feet AGL)	Percent of Total
0-49	28.90%
50-99	10.88%
100-199	6.71%
200-299	6.81%
300-399	5.40%
400-499	2.48%
500-599	5.85%
600-699	1.46%
700-799	1.34%
800-899	1.76%
900-999	0.64%
1,000-1,499	7.21%
1,500-1,999	6.78%
2,000-2,999	7.01%
3,000-3,999	4.58%
4,000-4,999	0.98%
5,000 and greater	1.22%

Source: AFSC 2006.

AFI 91-202 (*The U.S. Air Force Mishap Prevention Program*) requires that Air Force installations supporting a flying mission have a BASH plan for the base. The Travis AFB plan provides guidance for reducing the incidents of bird strikes in and around areas where flying operations are being conducted. The plan is reviewed annually and updated as needed.

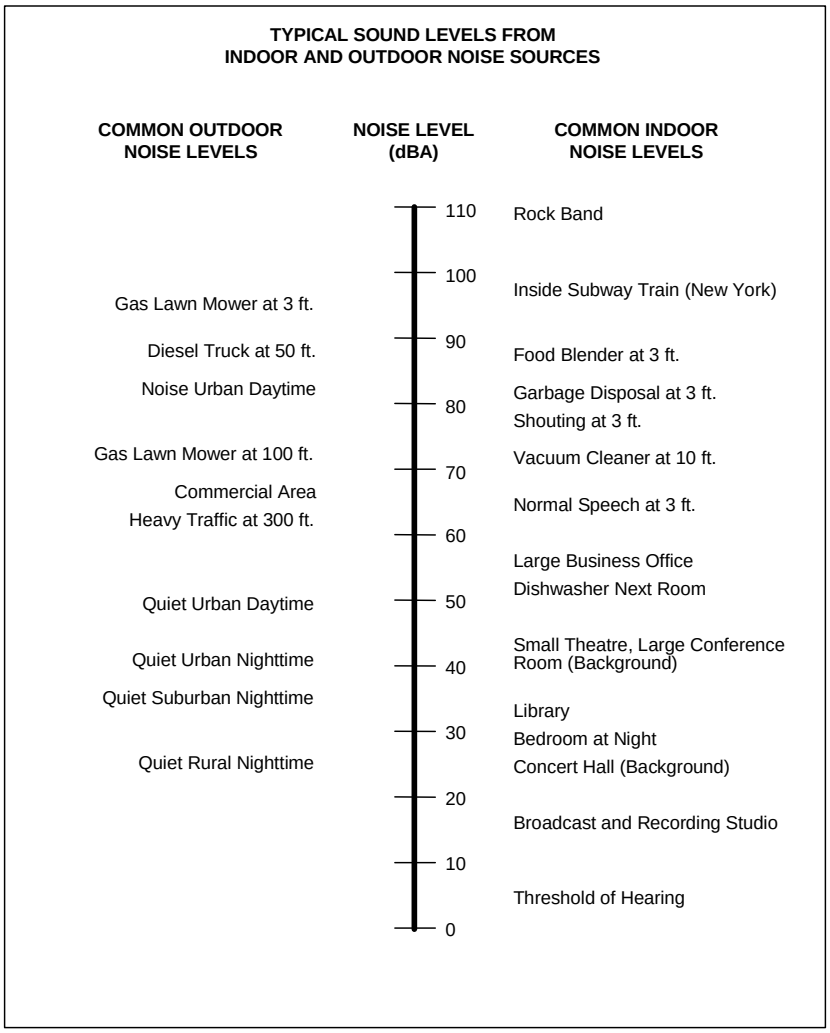
3.1.2 Noise

Aviation-related activities at Travis AFB dominate the acoustic environment. Equipment used during construction also generates noise. Therefore, noise from aircraft operations and construction activities is analyzed.

The characteristics of sound include parameters such as amplitude (loudness), frequency (pitch), and duration. Sound varies over an extremely large range of amplitudes. The decibel (dB) is the accepted standard unit for describing levels of sound. Decibels are expressed in logarithmic units to account for the variations in amplitude. On the dB scale, an increase of 3 dB represents a doubling of sound energy. A difference on the order of 10 dB represents a subjective doubling of loudness.

Different sounds have different frequency contents. Because the human ear is not equally sensitive to sound at all frequencies, a frequency-dependent adjustment, called A-weighting, was developed to measure sound similar to the way the human hearing system responds. The adjustments in amplitude, established by the American National Standards Institute (ANSI 1983), are applied to the frequency content of the sound. Figure 3-2 depicts typical A-weighted sound pressure levels (dBA) for various sources. As indicated in Figure 3-2, 65 dBA is equivalent to normal speech at a distance of 3 feet.

Figure 3-2 Typical A-Weighted Noise Levels



Noise is defined as sound that is undesirable because it interferes with speech and hearing, is intense enough to damage hearing, or is otherwise annoying. Noise levels change with time and the distance of the receptor from the noise source.

3.1.2.1 Noise Metrics and Analysis Methods

A variety of metrics may be used to assess the impacts of noise. Depending on the specific situation, appropriate analysis may include single event or averaged metrics. Single event metrics are used to assess the potential impacts of noise on structures and animals, and are sometimes used in the assessment of human effects. Sound exposure level (SEL), a single event metric, is commonly used to evaluate sleep disturbance. Averaged noise metrics are useful in characterizing the overall noise environment and are primarily used to analyze community (population) exposure to noise. Averaged sound exposure is expressed as the Day-Night Average Sound Level (DNL) metric or, in

California, the Community Noise Equivalent Level (CNEL). The USEPA selected DNL as the uniform descriptor of averaged sound exposure. Subsequently, federal agencies, including the DoD, adopted DNL for expressing averaged sound. In practice, CNEL and DNL are often used interchangeably.

Single Event Sound Metrics

Although the highest dBA level measured during an event (*i.e.*, maximum sound level, L_{max}) is the most easily understood descriptor for a noise event, alone it provides little information. Specifically, it provides no information concerning either the duration of the event or the amount of sound energy. Thus, SEL, which is a measure of the physical energy of the noise event and accounts for both intensity and duration, is used for single event noise analysis. Subjective tests indicate that human response to noise is a function not only of the maximum level, but also of the duration of the event and its variation with respect to time. Evidence indicates that two noise events with equal sound energy will produce the same response. For example, a noise at a constant level of 85 dBA lasting for 10 seconds would be judged to be equally as annoying as a noise event at a constant level of 82 dBA and duration of 20 seconds (*i.e.,* 3 dBA decrease equals one half the sound energy but lasting for twice the time period). This is known as the "equal energy principle." The SEL value represents the A-weighted level of a constant sound with a duration of one second, providing an amount of sound energy equal to the event under consideration.

By definition, SEL values are referenced to a duration of one second and should not be confused with either the average noise (L_{eq}) or L_{max} associated with a specific event. The L_{eq} is the constant level that has the same A-weighted sound energy as that contained in the time-varying sound. When an event lasts longer than one second, the SEL value will be higher than the L_{max} from the event. The L_{max} would typically be 5 to 10 dBA below the SEL value for aircraft overflight. Figure 3-3 presents the relationship of SEL, L_{max}, and L_{eq} to the time history for a noise event from aircraft overflight.

Noise from low-flying aircraft arriving at and departing from an airfield at night may cause sleep disturbance. DNL and CNEL incorporate consideration of sleep disturbance by assigning a 10 dBA penalty to the SELs of nighttime noise events (10:00 p.m. to 7:00 a.m.). Additionally, CNEL adds a 5-dB upward adjustment to each aircraft noise producing event in the 7:00 p.m. to 10:00 p.m. time period. However, single noise events, not average sound levels, correlate better with sleep disturbance.

Studies have estimated the percentage of awakenings that may be experienced by people exposed to different SELs. The Federal Interagency Committee on Aviation Noise (FICAN, formed in 1993 as recommended by the Federal Interagency Committee on Noise [FICON]), based on field studies, recommends a dose-response curve for predicting sleep awakening. Figure 3-3 compares the FICAN recommendation of 1997 to the 1992 FICON recommendation for predicting sleep awakening. FICAN takes the conservative position that, because the adopted curve represents the upper limit of the data presented, it should be interpreted as predicting the maximum percentage of the

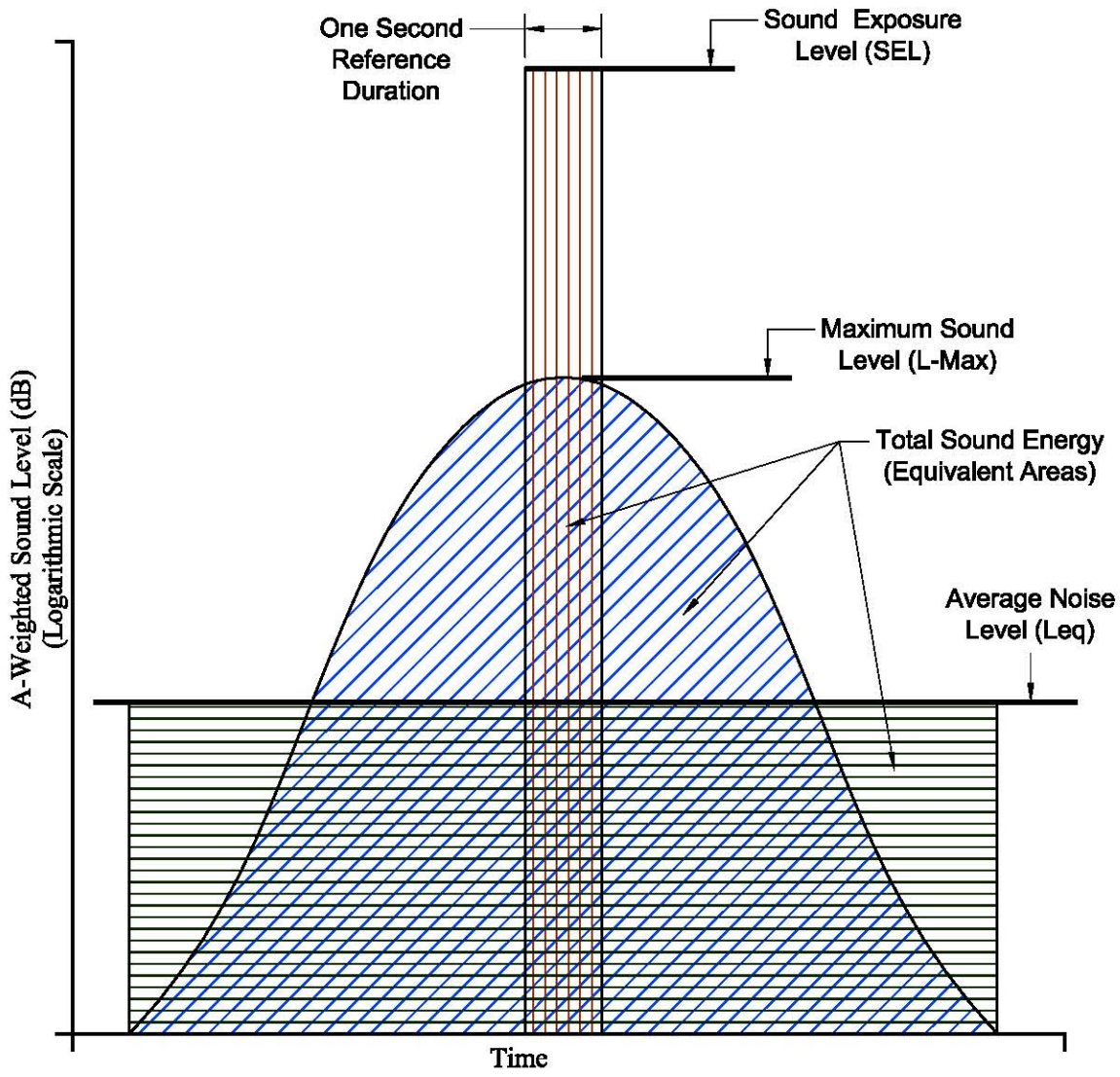
exposed population expected to be awakened. Based on this new position, it is estimated that outdoor SELs of 80 to 100 dBA could result in 4 to 10 percent awakenings in the exposed population. Noise must penetrate the residence to disturb sleep. Interior noise levels are lower than exterior levels due to the attenuation of the sound energy by the structure. The amount of attenuation provided by the building is dependent on the type of construction and whether the windows are open or closed. The approximate national average attenuation factors are 15 dBs for open windows and 25 dBs for closed windows. Twenty dBA is conservatively used to estimate attenuation for a typical dwelling unit (USEPA 1974).

Averaged Noise Metrics

Single event analysis has a major shortcoming -- single event metrics do not describe the overall noise environment. DNL and CNEL are the measure of the total noise environment. As previously mentioned, DNL averages the sum of all aircraft noise producing events over a 24-hour period, with a 10-dBA upward adjustment added to the nighttime events (between 10:00 p.m. and 7:00 a.m.). Additionally, CNEL adds a 5-dB upward adjustment to each aircraft noise producing event in the 7:00 p.m. to 10:00 p.m. period.

Figure 3-4 depicts the relationship of the single event, the number of events, the time of day, and DNL or CNEL. This adjustment is an effort to account for increased human sensitivity to nighttime noise events. The summing of sound during a 24-hour period does not ignore the louder single events, it actually tends to emphasize both the sound level and number of those events. The logarithmic nature of the dB unit causes sound levels of the loudest events to control the 24-hour average.

DNL and CNEL are the accepted unit for quantifying annoyance to humans from general environmental noise, including aircraft noise. The Federal Interagency Committee on Urban Noise (FICUN) developed land use compatibility guidelines for noise exposure areas (FICUN 1980). Based on these FICUN guidelines, the FAA developed recommended land uses in aircraft noise exposure areas. The Air Force uses DNL (except for California where CNEL is used) as the method to estimate the amount of exposure to aircraft noise and to predict impacts. Land use compatibility and incompatibility are determined by comparing the predicted DNL or CNEL level at a site with the recommended land uses.



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Sound Exposure Level, Maximum Sound Level, and Average Noise Level Comparison to Aircraft Noise Time History

Figure 3-3

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Figure 3-4 Recommended Sleep Disturbance Dose Response Relationship

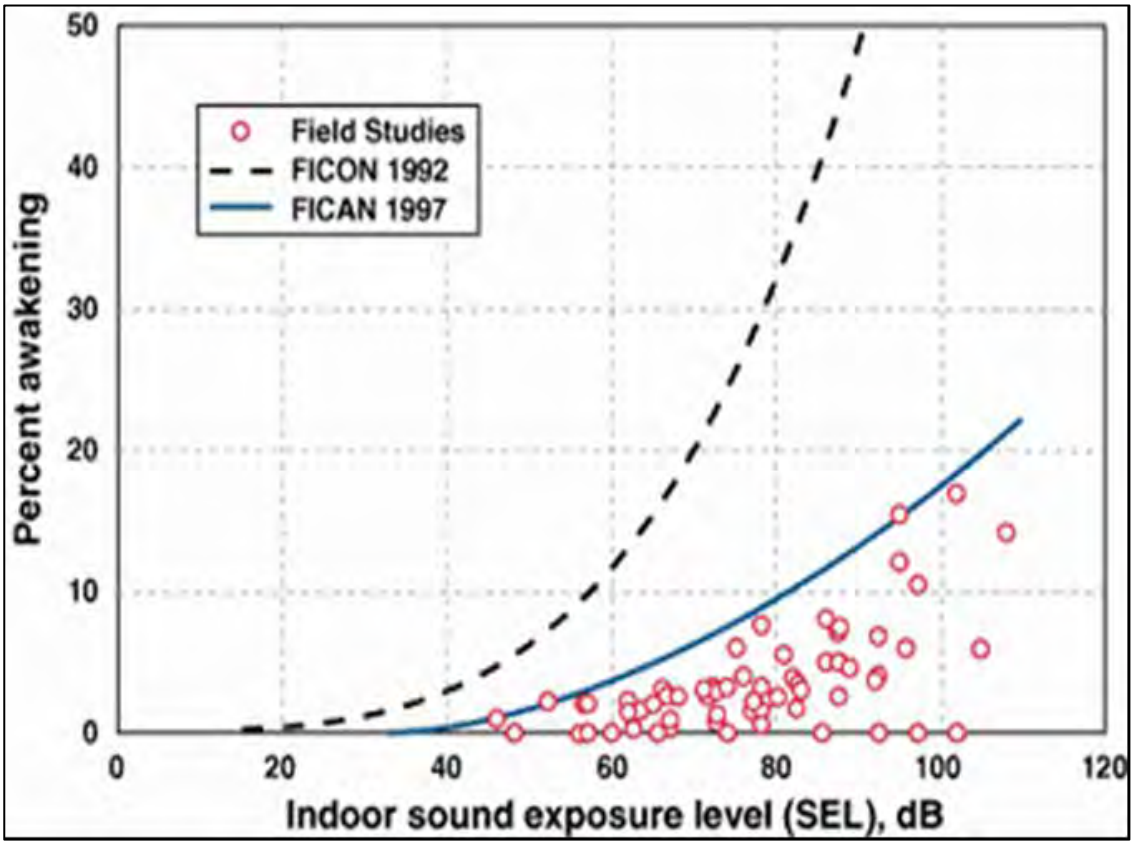
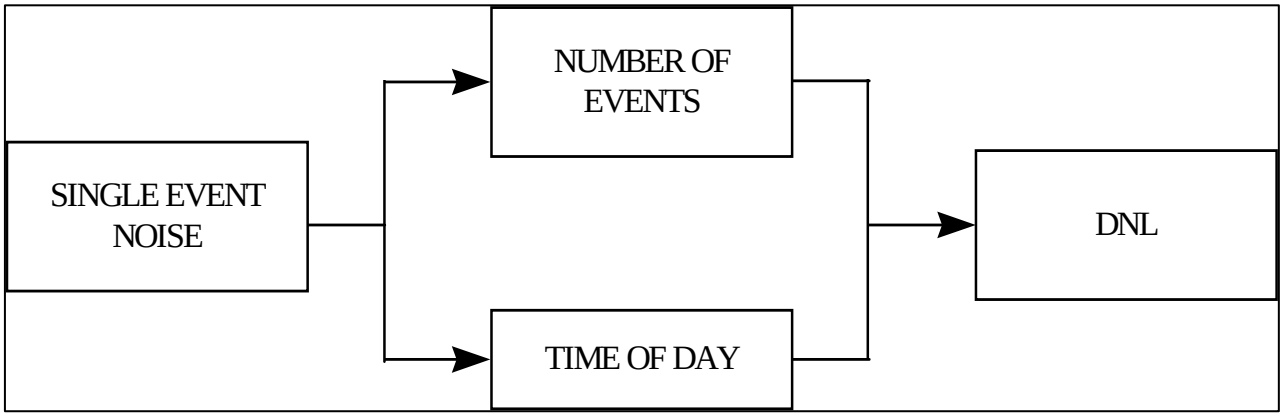


Figure 3-5 Day-Night Average A-Weighted Sound Level



Noise Analysis Methods

NOISEMAP noise model, version 7.296, was used to develop the noise contours and DNL values from airfield operations for this EA. Maximum sound level noise used in this EA was calculated by using the Flyover Noise Calculator (USAF 2002).

NOISEMAP is a suite of computer programs developed by the Air Force to predict noise exposure in the vicinity of an airfield due to aircraft flight, maintenance, and ground run-up operations. Data describing flight tracks and flight profile use, power settings, ground run-up information by type of aircraft/engine, and meteorological variables are assembled and processed for input into NOISEMAP. The model uses this information to calculate SEL and DNL or CNEL values at points on a regularly spaced grid surrounding the airfield. A plotting program generates contour lines connecting points of equal DNL or CNEL values in a manner similar to elevation contours shown on topographic maps. Contours are generated as 5 dB intervals beginning at DNL 65 dBA, the maximum level considered acceptable for unrestricted residential use. The contours produced by NOISEMAP are used in the averaged noise analysis sections in this EA. While there is no technical reason why a lower level cannot be measured or calculated for comparison purposes, DNL 65 dBA:

- was adopted by the DoD, USEPA, FAA, and HUD as the threshold for comparing and assessing community noise effects; and
- represents a noise exposure level normally dominated by aircraft noise and not other community or nearby highway noise sources.

Although the number of military and civil aircraft operations at an installation usually varies from day to day, NOISEMAP requires input of the specific numbers of daily flight and aircraft maintenance engine runup operations. The Air Force does not follow the FAA's use of the "average annual day" in which annual operations are averaged over an entire 365-day year. Neither does the Air Force use the "worst-case day" since it typically does not represent the typical noise exposure. Instead, the Air Force uses the "average busy day" concept in which annual operations for an aircraft type are averaged over the number of flying days per year by that aircraft type. Non-flying days (*e.g.*, weekends or holidays) are not used in computing the "average busy day" operations. The "average busy day" concept is used for noise modeling in this EA.

As discussed in the preceding paragraph, DNL 65 dBA is used in all states except California as the threshold for comparing and assessing community noise effects. In California, contours are generated beginning at CNEL 60 dBA, the level at which residential use is conditionally acceptable. The contours produced by NOISEMAP are used in the day-night average sound analysis sections in this EA.

3.1.2.2 Baseline Noise Analysis

Single Event Noise Analysis

Table 3.1-3 lists the SEL and L_{max} values for the aircraft based at Travis AFB at takeoff power and at varying slant range distances from the aircraft.

Table 3.1-3 Aircraft Noise Levels in Sound Exposure Level and Maximum Sound Level as a Function of Slant Range Distance from Aircraft, Travis AFB

Aircraft	200 Feet	300 Feet	500 Feet	1,000 Feet	2,000 Feet
SEL					
C-130	103	100	97	91	86
C-17	115	112	108	102	96
C-5	127	124	120	114	106
KC-10	112	109	105	99	93
Lmax					
C-130	100	96	92	85	77
C-17	113	109	104	96	88
C-5	124	120	114	106	97
KC-10	109	105	100	92	84

Note: Values reflect dBA.

Averaged Noise Analysis

The primary source of noise in the vicinity of Travis AFB is airfield operations. Baseline noise conditions are based on the average daily airfield operations shown on Table 2.2-1 (No Action Alternative). About 222 average daily airfield operations occur at Travis AFB under the baseline condition. These operations and the resultant baseline noise environment are based on the cumulative impact noise analysis at Travis AFB from the West Coast C-17 Basing EA. Figure 3-6 shows the baseline condition aircraft ground tracks, and Figure 3-7 depicts the noise exposure area for the baseline.

Figure 3-8 depicts the noise contours for the cumulative impact noise analysis at Travis AFB from the West Coast C-17 Basing EA and is presented for informational purposes. Although the number of aircraft operations and the flight track and flight profile (*i.e.*, aircraft altitude, airspeed, and power setting at various points along the track) data are the same for the noise contours presented in Figures 3-7 and 3-8, there are slight differences in noise exposure when comparing the two figures. The baseline noise contours in Figure 3-7 were produced by NOISEMAP noise model, version 7.296, while the contours in Figure 3-8 were produced by NOISEMAP version 6.5. NOISEMAP version 7.296, the current version of the model, contains improved algorithms that calculate the noise and is more accurate than previous versions. For this reason, the baseline noise exposure in Figure 3-7 is used for impact analysis comparison purposes in Chapter 4.

Table 3.1-4 presents the results of over a dozen studies on the relationship between noise and annoyance levels. This relationship was suggested by Schultz (1978) and was reevaluated for use in describing the reaction of people to environmental noise (Fidell, *et al.* 1988). These data provide a perspective on the level of annoyance that might occur. For example, 12 to 22 percent of people exposed on a long-term basis to DNL or CNEL of 65 to 70 dBA are expected to be potentially highly annoyed by noise events. The study results summarized in Table 3.1-2 are based on outdoor noise levels.

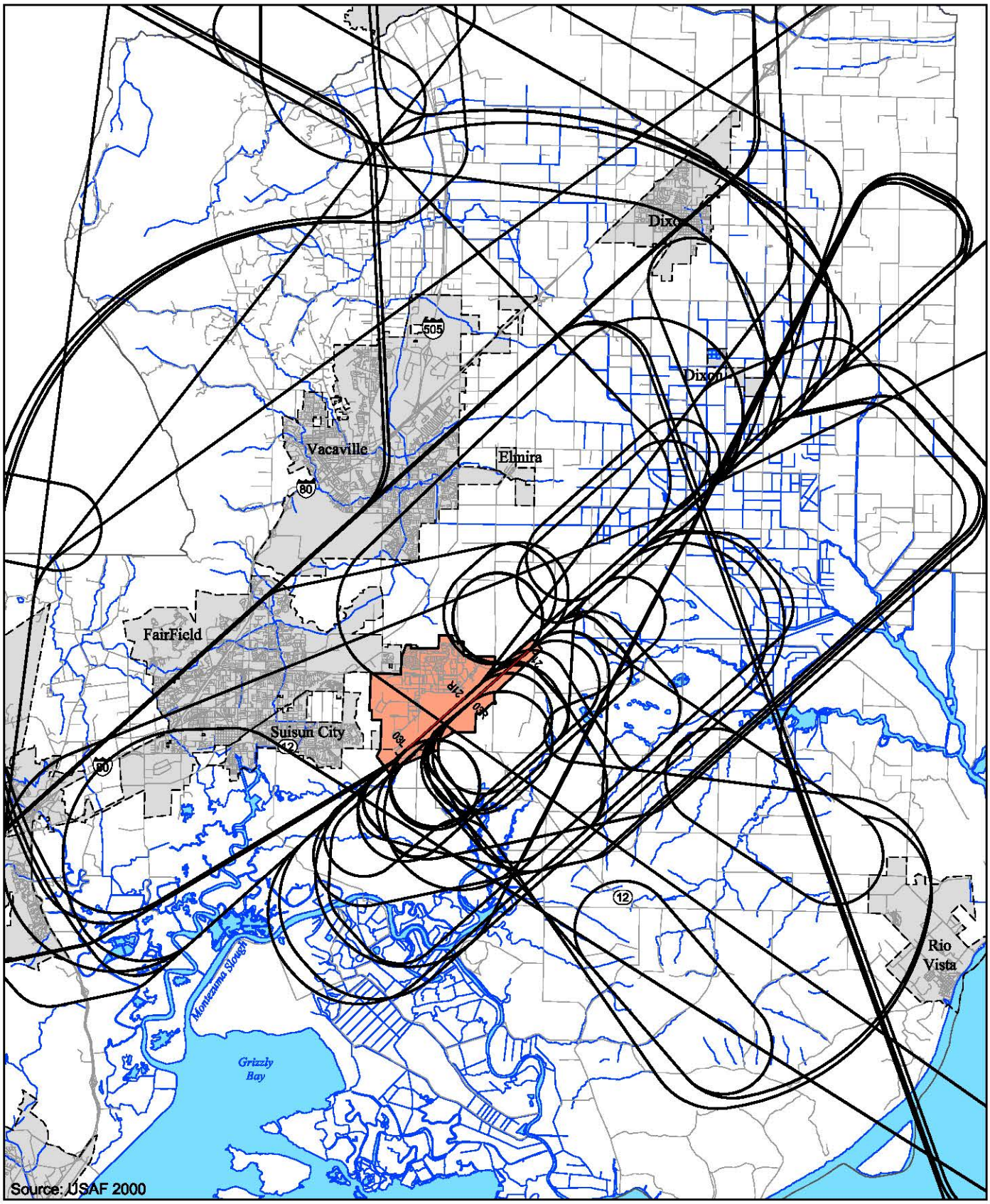
Table 3.1-4 Theoretical Percentage of Population Potentially Highly Annoyed by Noise Exposure

DNL or CNEL Intervals in dBA	Percentage of Persons Highly Annoyed
<65	<12
65-70	12-22
70-75	22-37
75-80	37-54
>80	61

Note: Noise impacts on individuals vary as do individual reaction to noise. This is a general prediction of the percent of the community potentially highly annoyed based on environmental noise surveys conducted around the world.

Source: Adapted from NAS 1977

Table 3.1-5 lists the number of acres (land area off-Base), the number of people off-Base within the CNEL 60 dBA and greater noise exposure area, and the estimated number of people who might be potentially highly annoyed by noise at those levels based on the contours in Figure 3-7. People would be exposed to aircraft noise in four of the five noise zones, with the CNEL 60-65 dBA noise zone containing 254 of the 375 persons exposed to CNEL 60-dBA and greater. These 375 persons would equate to 1 percent of the estimated 64,492 persons (based on 2000 census data) who live within the approximate 5-mile radius area associated with airfield airspace environment. This area within the approximate 5-mile radius includes the airspace allocated to the air traffic control tower and is the area in which closed patterns and maneuvering associated with takeoffs and landings is accomplished.



Travis AFB

LEGEND

- Ground Track
- Runway
- Roadway
- City Limits
- Travis AFB

N

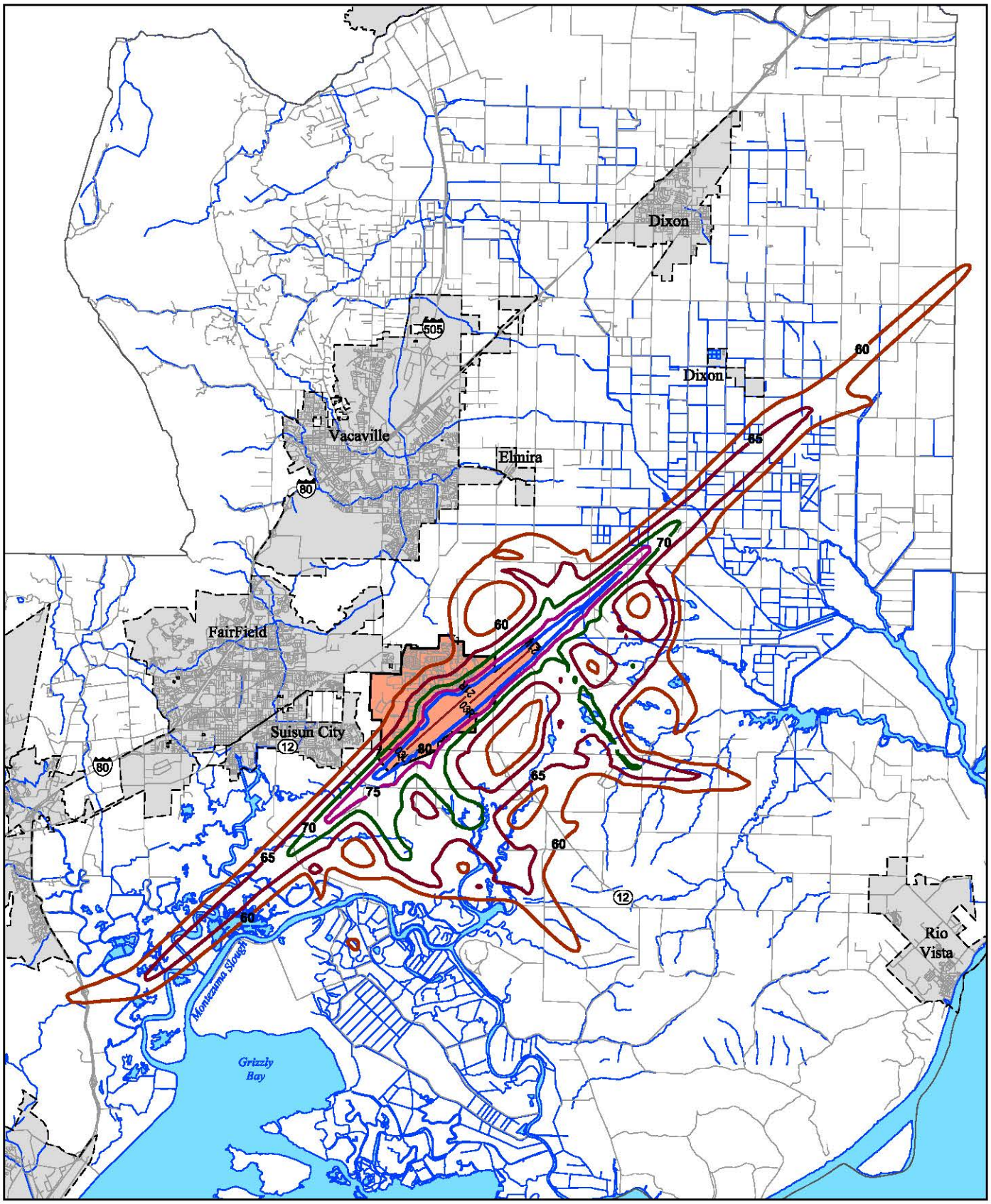
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Baseline Aircraft Ground Tracks, Travis AFB

Figure 3-6

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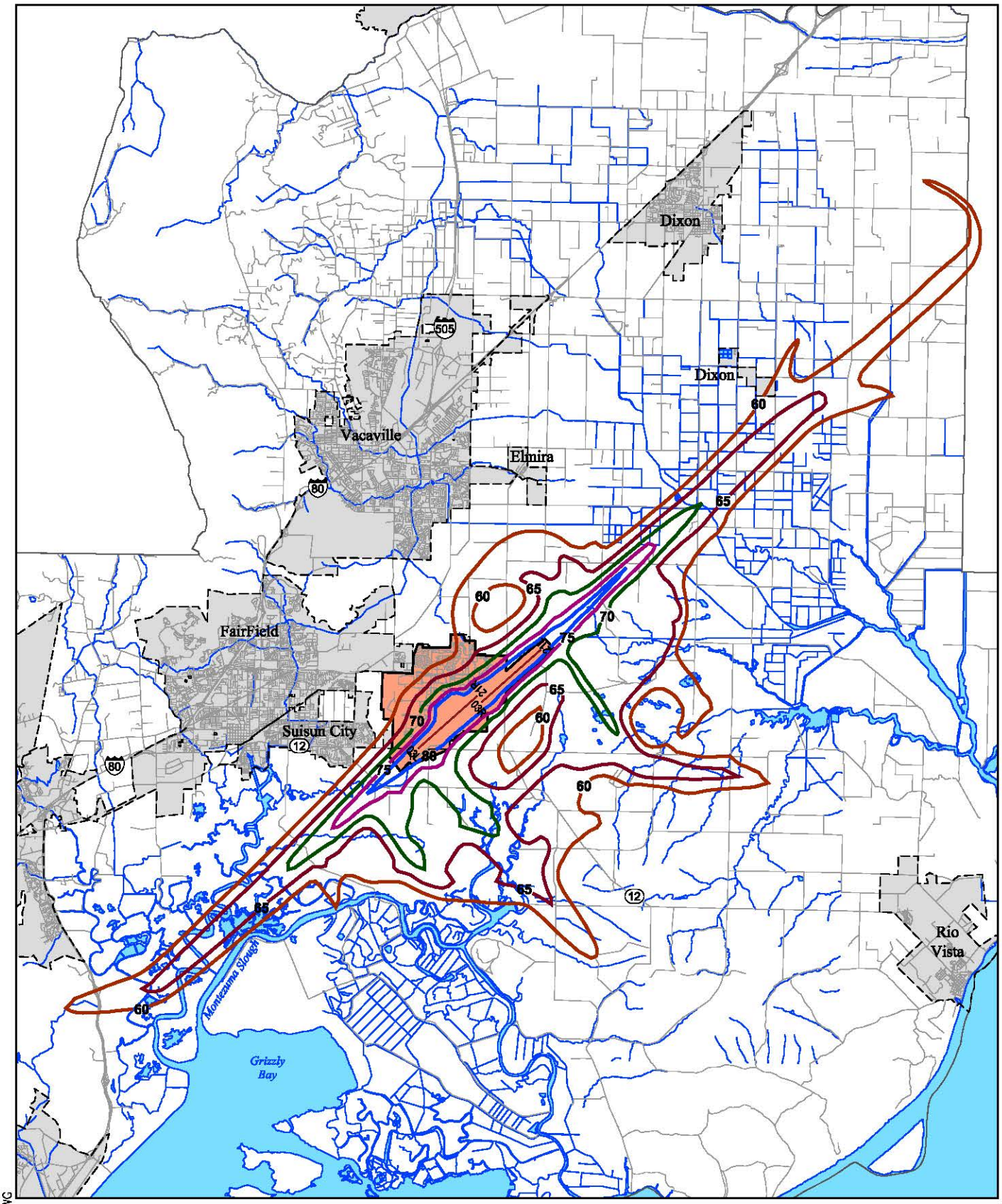


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Baseline Noise Contours, Travis AFB

Figure 3-7

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2003 Cumulative Impact Noise Contours, Travis AFB

Figure 3-8

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Table 3.1-5 Baseline Noise Exposure, Travis AFB

	CNEL Interval (dBA)					
Category	**60-65**	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres	21,876	15,283	4,225	1,470	287	43,141
People	254	102	13	6	0	375
People Potentially Highly Annoyed	30	22	5	3	0	60

Note: Acres reflect only off-Base land area. Population data used to determine the number of people within a noise zone were obtained from the United States Census Bureau 2000 census. It was assumed that population was equally distributed within a census tract area to estimate affected population. Using the noise contour information, the number of acres of land in each noise zone (e.g., CNEL 60-65 dBA, 65-70 dBA, 70-75 dBA, 75-80 dBA, and 80 dBA and greater) were divided by the number of acres of land in each census block to determine the portion of the census tract within each noise zone. The population total in each block-group was then multiplied by this ratio to estimate affected population within each zone. This process was used throughout the EA. People highly annoyed were determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1-4

Effect of Aircraft Noise on Structures

Possible noise-related impacts on structures should be considered in the context of accepted research results. The recent development of larger commercial and military aircraft has prompted research into the effects of noise vibrations on both modern and historic structures.

Some building materials are more sensitive than others to external pressures and induced vibrations. Windows with large panes of glass are most vulnerable. Plaster walls in frame buildings are susceptible to cracking. Components that are least likely to experience damage are masonry walls of stone, concrete block, adobe, or brick. Appropriate building design can also reduce the possibility of damage from vibration. Research has not proven categorically that old buildings are more vulnerable to vibration than newer buildings, but prudence dictates special consideration be given to unique structures of historical significance. Table 3.1-6 lists the effects of sound on structures and Table 3.1-3 presents the L_{max} for the aircraft based at Travis AFB. The C-17 and C-130 aircraft that currently operate at the Travis AFB produce maximum sound levels of 113 and 100 dBA, respectively, when the aircraft is directly overhead at 200 feet AGL on takeoff. The based aircraft producing the greatest maximum sound level is the C-5, which produces 124 dBA at 200 feet AGL. These sound levels would be below the level at which damage to structures would be anticipated (*i.e.*, 127 dBA).

Table 3.1-6 Effects of Noise on Structures

dBA	psf[a]	Effects Summary	
0-127	0-1	Typical community exposures	No damage to structures No significant public reaction
127-131	1.0-1.5	(generally below 2 psf)	Rare minor damage Some public reaction
131-140	1.5-4.0	Window damage possible, increasing public reaction, particularly at night	
140-146	4.0-8.0[b]	Incipient damage to structures	
146-171	8.0-144.0	Measured booms at minimum altitudes experienced by humans; no injury	
185	720.0	Estimated threshold for eardrum rupture (maximum overpressure)	
194	2,160.0	Estimated threshold for lung damage (maximum overpressure)	

psf = pounds per square foot
With the exception of window glass breakage, booms less than 11 psf should not damage "building structures in good repair" (Clarkson and Mayes 1972)
Source: Speakman 1992

3.1.3 Land Use

Travis AFB

The Travis AFB General Plan provides guidance for land use and future development on the Base. Existing land use patterns on Travis AFB have evolved over the past 50 years based on the configuration of the two northeast-southwest runways. Facility development and supporting infrastructure have evolved over time as missions and requirements have changed or expanded. The General Plan identifies 10 land use categories for the Base, dependent on the function of the activity within each facility. Aircraft operations and maintenance uses are prevalent adjacent to the runways and aircraft parking ramps. Community and administrative uses are predominantly located in the center of the Base, with accompanied housing located in the extreme northern portion of the Base. Open space persists in the western and southern Base areas. The Travis AFB General Plan provides recommendations for the expansion and redevelopment of Aircraft Operations and Maintenance land use areas should mission growth or reorganization occur.

Land use in the immediate vicinity of Travis AFB is predominantly agricultural with interspersed rural residences, except to the west, where urban development is adjacent to the Base. There are areas of residential, industrial, commercial, and public uses extending from Cannon Drive to Peabody Road north of Air Base Parkway in the City of Fairfield. Similar uses occur in unincorporated Solano County to the north of the city limits and east of Peabody Road. To the west of Peabody Road, industrial development is occurring within the City of Fairfield, with major urbanized portions of the City of Fairfield extending to a point approximately a half mile west of the Base. Residential development in Suisun City is located near the southwest corner of the Base along Walters Road, but is separated from the Base by safety clearance zone easements where no residential development is allowed. The Suisun City Lambrecht Sports Complex and Public Works Yard are located at the southwest corner of the Base.

The purpose of the long-standing AICUZ program is to promote compatible land development in areas subject to aircraft noise and accident potential around military airfields. The Air Force has no desire to recommend land use regulations that render property economically useless. An AICUZ Study reaffirms Air Force policy of assisting local, regional, state, and federal officials in the areas surrounding the military installation by promoting compatible development within the AICUZ area of influence and protecting Air Force operational capability from the effects of land use that are incompatible with aircraft operations. AICUZ studies make recommendations for local government agencies to plan, zone, and mitigate noise, and to help protect the integrity of the installation's flying mission.

AICUZ land use guidelines (see Table 3.1-7) reflect land use recommendations for CZs, APZs I and II, and four noise exposure zones. Subchapter 3.1.1.2 describes the CZ and APZs. The land use guidelines in Table 3.1-7 were established on the basis of studies prepared and sponsored by several federal agencies, including HUD, USEPA, Air Force, and state and local agencies. The guidelines recommend land uses that are compatible with airfield operations while allowing maximum beneficial use of adjacent properties. The Air Force has an obligation to the inhabitants of the areas surrounding Travis AFB and to the citizens of the United States to point out ways to protect the people in adjacent areas, as well as the public investment in the installation itself.

Table 3.1-7 Recommended Land Use, Travis AFB

	Clear Zones and Accident Potential Zones			Noise Zones			
Generalized Land Use	**CZ**	**APZ I**	**APZ II**	**65-69 dBA**	**70-74 dBA**	**75-79 dBA**	**80+ dBA**
Residential	No	No	Yes[1]	Not Recommended[4]	Not Recommended[4]	Not Recommended	Not Recommended
Commercial	No	No	Yes[2]	Recommended	Recommended	Recommended	Not Recommended
Industrial	No	Yes[2]	Yes[2]	Recommended	Recommended	Recommended	Recommended
Public/Quasi-Public	No	No	Yes[2]	Recommended	Not Recommended[4]	Not Recommended[4]	Not Recommended
Recreational	No	Yes[2]	Yes[2]	Recommended	Recommended	Not Recommended	Not Recommended
Open/Agriculture /Low Density	No[3]	Yes[2]	Yes[2]	Recommended	Recommended	Recommended	Recommended

1. Suggested maximum density one dwelling unit per acre.

2. Only limited low-density, low-intensity uses recommended.

3. Except for limited agricultural uses.

4. Unless sound attenuation materials are installed.

Source: Adapted from USAF 1999.

Land Use Plans and Zoning Regulations

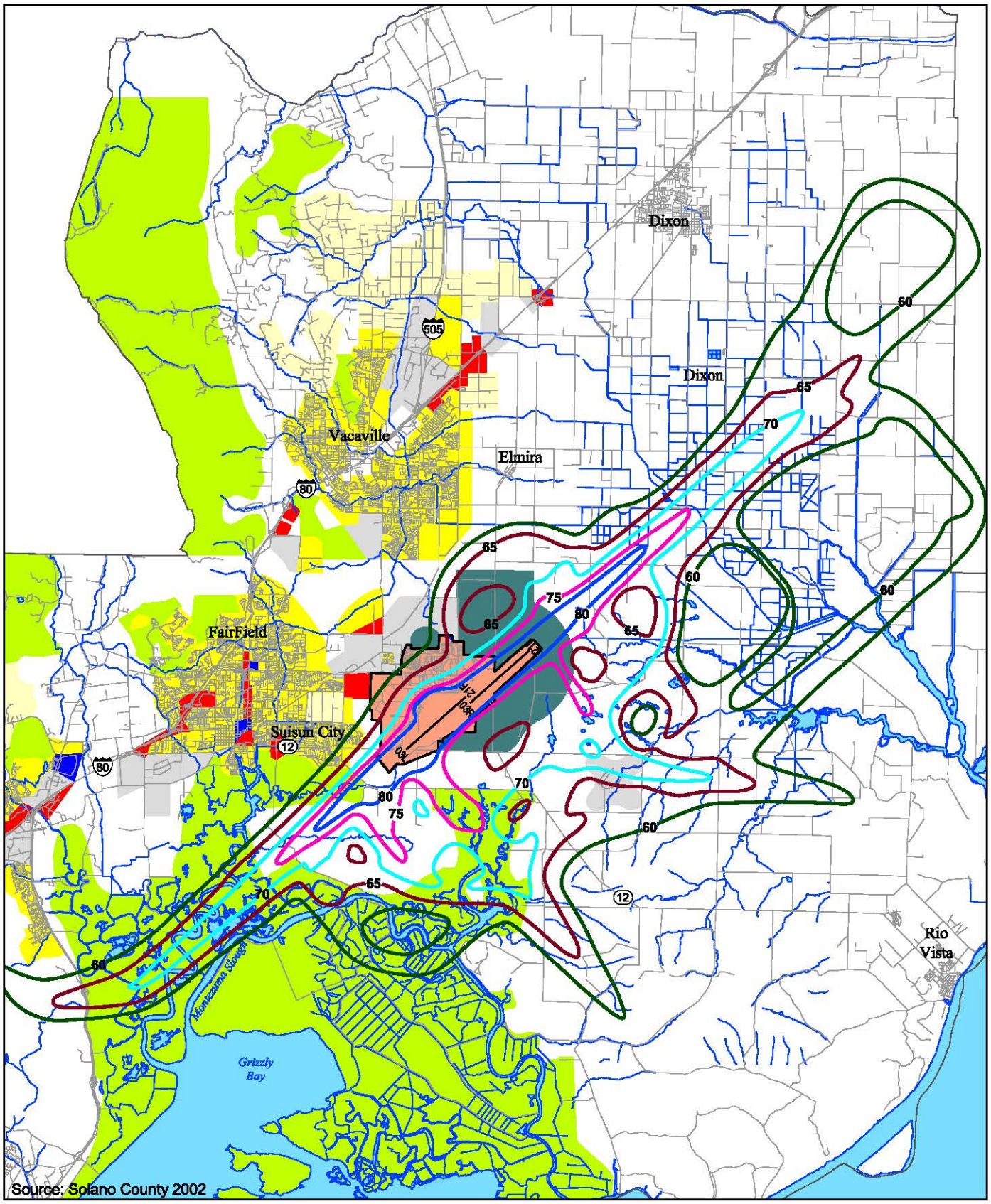
The adopted Land Use Elements of the General Plans for Fairfield and Suisun City include proposed land uses within their respective city limits, and in proposed adjacent growth areas outside their city limits. These growth areas overlap the Solano County

land use designations, but the Solano County designations control land use in these areas until annexed by the respective municipality.

The Travis AFB Land Use Compatibility Plan (Solano County 2002), adopted by the Solano County Airport Land Use Commission (ALUC) provides direction for future use of lands in the vicinity of the Base. Land use issues of interest to the ALUC include those involving noise and overflight compatibility, obstruction clearances, and safety of persons on the ground. Noise contours were produced as part of the Travis AFB Land Use Compatibility Plan based on a "maximum mission" scenario. These contours are depicted on Figure 3-9. A determination of consistency with the Travis AFB Land Use Compatibility Plan is required of all new development proposals within the ALUC planning boundary, which includes all lands that could be negatively impacted by aircraft operations from the Base. Standards for the ALUC determination of consistency are similar to the land use compatibility standards of the Travis AFB AICUZ program. If the ALUC finds that a proposed development is not consistent with the Travis AFB Land Use Compatibility Plan, the responsible local agency may amend the proposal to be consistent, or it may override the ALUC determination with a two-thirds vote of its governing body.

The Solano County ALUC, adopted in 1995, provides direction for the future use of lands in the unincorporated areas of the county. There are six city-centered growth areas, one of which is the Fairfield-Suisun Urban Area. It is estimated that almost all population growth will occur in and around these six urban areas. The urban growth line (see Figure 3-9) clearly defines the extent of urbanization around each city in the county and represents estimated urban expansion within the next 15 to 20 years. The ALUC designation for areas surrounding Travis AFB on the north, east, and south is agriculture or extensive agriculture, and these areas are currently zoned for agricultural use. The land south of Highway 12 is proposed as marsh. The remaining area west of the Base (west of Peabody Road) is within the urban growth line, and the proposed uses reflect the Fairfield Land Use Plan, with residential, commercial, and industrial growth.

The City of Fairfield updated its Land Use Element as part of a comprehensive update to the city's General Plan. The update also included the Travis Protection Element. The revised plan adopts a more stringent noise standard requiring that no new or additional residential zoning be adopted within the CNEL 60 dBA noise contours. Under the 2002 revisions, a significant portion of land located east of North Gate Road, as well as land adjacent to the Base west of North Gate Road, and land southeast of the Base, has a "Travis Reserve" land use designation. Land in the Travis Reserve is set aside for future expansion of Travis AFB only as long as the military mission of the Base remains. No residential uses will be permitted in the Travis Reserve and the City of Fairfield supports its continued use for agriculture and grazing. Approximately 800 acres west of North Gate Road and north of the proposed Travis Reserve is designated for a technology park. The unincorporated area on the east side of Peabody Road near the



Travis AFB

LEGEND

- CNEL 60 dBA Contour
- CNEL 65 dBA Contour
- CNEL 70 dBA Contour
- CNEL 75 dBA Contour
- CNEL 80 dBA Contour
- Travis AFB
- Commercial
- Residential
- Rural Residential
- Industrial
- Agricultural
- Recreation/Open
- Public
- Travis Reserve

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0 19,000 Feet

Solano County-Travis AFB Land Use Compatibility Plan Noise Contours and Local Zoning

Figure 3-9

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northwest corner of the Base between the city limits and the former Sacramento Northern Railroad is designated as a combination office commercial, community commercial, and medium- and high-density residential. Other areas west of the Base would remain predominantly non-residential with commercial, light industrial, and mixed-use light industrial/commercial. The only residential use in the vicinity of the Base would remain the area east of Peabody Road between Dobe Lane and Whitney Drive, while the public land use designation would remain for the Vanden High School and Golden West Intermediate school sites.

The Suisun City Land Use Element establishes a proposed land use pattern to the southwest of Travis AFB that is predominantly residential, extending along Walters Road from Tabor Avenue to Scandia Road. At the northern end of this area is the Peterson Ranch, approved by Suisun City for residential development, with smaller areas near the intersection of Scandia and Walters Roads designated for commercial development. The area south of Scandia Road to Highway 12 is designated as "Agriculture Open Space Reserve." All undeveloped lands south of Highway 12 are within the Suisun Marsh Protection District. The land use controls within the Suisun Marsh Protection District effectively prevent any further urban development south of Highway 12.

3.1.4 Air Quality

3.1.4.1 Air Pollutants and Regulations

Air quality in any given region is measured by the concentration of various pollutants in the atmosphere, typically expressed in units of parts per million (ppm) or in units of micrograms per cubic meter ($\mu g/m^3$). Air quality is not only determined by the types and quantities of atmospheric pollutants, but also by surface topography, size of the air basin, and by prevailing meteorological conditions.

The CAA, as amended in 1977 and 1990, provides the basis for regulating air pollution to the atmosphere. Different provisions of the CAA apply depending on where the source is located, which pollutants are being emitted, and in what amounts. The CAA required the USEPA to establish upper limits for certain criteria pollutants. These criteria pollutants are usually referred to as the pollutants for which the USEPA has established National Ambient Air Quality Standards (NAAQS). The ceilings were based on the latest scientific information regarding the effects a pollutant may have on public health or welfare. Subsequently, the USEPA promulgated regulations that set NAAQS. Two classes of standards were established: primary and secondary. Primary standards define levels of air quality necessary, with an adequate margin of safety, to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards define levels of air quality necessary to protect public welfare (*e.g.,* decreased visibility, damage to animals, crops, vegetation, wildlife, and buildings) from any known or anticipated adverse effects of a pollutant.

Air quality standards are currently in place for six pollutants or "criteria" pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), sulfur oxides (SO_X, measured as sulfur dioxide [SO_2]), lead (Pb), and particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM_{10}) and 2.5 micrometers ($PM_{2.5}$). There are many suspended particles in the atmosphere with aerodynamic diameters larger than 10 micrometers. The collective of all particle sizes is commonly referred to as total suspended particulates (TSP). TSP is defined as particulate matter as measured by the methods outlined in 40 CFR Part 50, Appendix B. The NAAQS are the cornerstone of the CAA. Although not directly enforceable, they are the benchmark for the establishment of emission limitations by the states for the pollutants USEPA determines may endanger public health or welfare.

Ozone (ground-level ozone), which is a major component of “smog,” is a secondary pollutant formed in the atmosphere by photochemical reactions involving previously emitted pollutants or precursors. Ozone precursors are mainly nitrogen oxides (NO_X) and VOCs. NO_X is the designation given to the group of all oxygenated nitrogen species, including nitric oxide (NO), NO_2, nitrous oxide (N_2O), and others. However, only NO, NO_2, and N_2O are found in appreciable quantities in the atmosphere. VOCs are organic compounds (containing at least carbon and hydrogen) that participate in photochemical reactions and include carbonaceous compounds except metallic carbonates, metallic carbides, ammonium carbonate, carbon dioxide (CO_2), and carbonic acid. Some VOCs are considered non-reactive under atmospheric conditions and include methane, ethane, and several other organic compounds.

As noted above, O_3 is a secondary pollutant and is not directly emitted from common emissions sources. Therefore, to control O_3 in the atmosphere, the effort is made to control NOx and VOC emissions. For this reason, NOx and VOCs emissions are calculated and reported in emission inventories.

The CAA does not make the NAAQS directly enforceable. However, the Act does require each state to promulgate a SIP that provides for “implementation, maintenance, and enforcement” of the NAAQS in each Air Quality Control Region (AQCR) in the state. The CAA also allows states to adopt air quality standards more stringent than the federal standards. The ambient air quality standards for California are contained in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations. Table 3.1-8 lists the national, California, and Washington ambient air quality standards.

Based on the requirements outlined in USEPA’s general conformity rule published in 58 Federal Register 63214 (November 30, 1993) and codified at 40 CFR Part 93, Subpart B (for federal agencies), a conformity analysis is required to analyze whether the applicable criteria air pollutant emissions associated with the project equal or exceed the threshold emission limits that trigger the need to conduct a formal conformity determination. The intent of the conformity rule is to encourage long range planning by evaluating the air quality impacts from federal actions before the projects are undertaken. This rule establishes an elaborate process for analyzing and determining whether a

proposed project in a nonattainment area conforms to the SIP and federal standards. The General Conformity Rule applies to federal actions occurring in air basins designated as nonattainment for criteria pollutants or areas designated as maintenance areas. Federal actions occurring in air basins in attainment of the NAAQS are not subject to the Conformity Rule.

Table 3.1-8 National, Washington State, and California Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Primary NAAQS[2,3,4]	Secondary NAAQS[3,5]	Washington Standards	California Standards[1]
Carbon Monoxide	8-hour 1-hour	9 ppm (10,000 μg/m3) 35 ppm (40,000 μg/m3)	No standard No standard	9 ppm (10,000 μg/m3) 35 ppm (40,000 μg/m3)	9 ppm (10,000 μg/m3) 20 ppm (20,000 μg/m3)
Lead	Quarterly 30 Day Ave	1.5 μg/m3 No Standard	1.5 μg/m3 No Standard	1.5 μg/m3 No Standard	No Standard 1.5 μg/m3
Nitrogen Oxides (measured as NO_2)	Annual 1-Hour	0.053 ppm (100 μg/m3) No Standard	0.053 ppm (100 μg/m3) No Standard	0.05 ppm (100 μg/m3) No Standard	No Standard 0.25 ppm (470 μg/m3)
Ozone[e]	8-hour 1-hour	0.08 ppm (157 μg/m3)[6] No Standard	0.08 ppm (157 μg/m3) No Standard	0.08 ppm (157 μg/m3)[6] No Standard	0.07 ppm (137 μg/m3) 0.09 ppm (180 μg/m3)
Particulate Matter (measured as PM_{10})	Annual 24-hour	50 μg/m3[7] 150 μg/m3	50 μg/m3[7] 150 μg/m3	50 μg/m3 150 μg/m3	20 μg/m3 50 μg/m3
Particulate Matter (measured as $PM_{2.5}$)	Annual 24-hour	15 μg/m3 65 μg/m3	15 μg/m3 65 μg/m3	15 μg/m3 65 μg/m3	12 μg/m3 65 μg/m3
Sulfur Oxides (measured as SO_2)	Annual 24-hour 3-hour 1-Hour	0.03 ppm (80 μg/m3) 0.14 ppm (365 μg/m3) No standard No Standard	No standard No standard 0.5 ppm (1,300 μg/m3) No Standard	0.02 ppm (52 μg/m3) 0.1 ppm (261 μg/m3) No standard 0.4 ppm (1,045 μg/m3)	No Standard 0.04 ppm (105 μg/m3) No Standard 0.25 ppm (655 μg/m3)

1 *California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter – PM_{10}, $PM_{2.5}$, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.*

2 *National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not be exceeded more than once a year. The ozone standard is attained when the fourth highest eight 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 the expected number of days per calendar year with a 24-hour average concentration is above 150 $\mu g/m^3$ is equal to or less than one. 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.*

3 *Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.*

4 *National Primary Standards: The levels of air quality necessary to protect the public health with an adequate margin of safety. Each state must attain the primary standards no later than three years after the state implementation plan is approved by the USEPA*

5 *National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the state implementation plan is approved by the USEPA.*

6 *New federal 8-hour ozone and fine particulate matter standards were promulgated by USEPA on July 18, 1997. The federal 1-hour ozone standard continues to apply in areas that violated the standard.*

7 *Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM_{10} standard in 2006 (effective December 17, 2006).*

Sources: CARB 2006 and USEPA 2007.

The NAAQS were revised in 2006 for the particulate matter (PM_{10} and $PM_{2.5}$) criterion to provide increased protection of public health and welfare. The previous annual PM_{10} standard of 50 µg/m^3 is being revoked because the available evidence does not suggest an association between long-term exposure to coarse particles at current ambient levels and health effects. The 24-hour standard of 150 µg/m^3 for PM_{10} remains in effect. The USEPA revised the 24-hour $PM_{2.5}$ standard from 65 µg/m^3 to 35 µg/m^3. This reduction was enacted to provide increased protection against health effects associated with short-term exposure. The annual standard for $PM_{2.5}$ remains at 15 µg/m^3.

Threshold (*de minimis*) rates of emissions were established in the final Rule to focus conformity requirements on those federal actions with the potential to have significant air quality impacts. With the exception of lead, the *de minimis* levels are based on the CAA's major stationary source definitions for the criteria pollutants (and precursor criteria pollutants) and vary by the severity of the nonattainment area. A conformity determination is required when the annual total of direct and indirect emissions from a federal action occurring in a nonattainment or maintenance area equals or exceeds the annual *de minimis* levels. Although the NAAQS standards for PM_{10} and $PM_{2.5}$ were revised in late 2006, the *de minimis* levels for PM_{10} and $PM_{2.5}$ with regards to conformity have not changed.

The *de minimis* level for O_3 applies to each precursor, VOC, and NO_X. The *de minimis* level for $PM_{2.5}$ applies to each precursor (as deemed significant), SO_2, NO_X, and VOC or ammonia. Table 3.1-9 lists the *de minimis* levels by pollutant applicable for federal actions in nonattainment areas. Table 3.1-10 lists the *de minimis* levels by pollutant applicable for federal actions in maintenance areas.

Table 3.1-9 *De Minimis* Levels for Criteria Pollutants in Nonattainment Areas

Pollutant	Designation	Tons/Year
Ozone*	Serious Nonattainment	50
	Severe Nonattainment	25
	Extreme Nonattainment	10
	Other nonattainment areas outside of ozone transport region	100
	Marginal and moderate nonattainment areas inside ozone transport region	50/100
Carbon Monoxide	All nonattainment areas	100
Sulfur Dioxide**	All nonattainment areas	100
Lead	All nonattainment areas	25
Nitrogen Dioxide	All nonattainment areas	100
Particulate Matter	Moderate nonattainment (PM_{10})	100
	Serious Nonattainment (PM_{10})	70
	Nonattainment ($PM_{2.5}$)	100

** includes precursors: VOC or NO_X*

*** Sulfur dioxide is often reported as sulfur oxides (SO_X)*

Source: 40CFR51.853

Table 3.1-10 *De Minimis* Levels for Criteria Pollutants in Maintenance Areas

Pollutant	Designation	Tons/Year
Ozone (NO_X)	All maintenance areas	100
Ozone (VOCs)	Maintenance areas inside an ozone transport region	50
	Maintenance areas outside of an ozone transport region	100
Carbon Monoxide	**All maintenance areas**	**100**
Sulfur Dioxide	All maintenance areas	100
Lead	All maintenance areas	25
Nitrogen Dioxide	All maintenance areas	100
Particulate Matter	All maintenance areas (PM_{10} and $PM_{2.5}$)	100

Source: 40CFR51.853

3.1.4.2 Regional Air Quality

The fundamental method by which the USEPA tracks compliance with the NAAQS is the designation of a particular region as "attainment" or "nonattainment." Based on the NAAQS, each state is divided into three types of areas for each of the criteria pollutants. The areas are:

- Those areas in compliance with the NAAQS (attainment);
- Those areas that do not meet the ambient air quality standards (nonattainment); and
- Those areas where a determination of attainment/nonattainment cannot be made due to a lack of monitoring data (unclassifiable – treated as attainment until proven otherwise).

Generally, areas in violation of one or more of the NAAQS are designated nonattainment and must comply with stringent restrictions until all standards are met. In the case of O_3, CO, and PM_{10}, USEPA divides nonattainment areas into different categories, depending on the severity of the problem in each area. Each nonattainment category has a separate deadline for attainment and a different set of control requirements under the SIP.

The California Air Resources Board (CARB) has regulatory authority for air pollution control in the State of California. Parts of nine counties comprise the San Francisco Bay Area Air Basin (AQCR 30). According to federal regulations (40 CFR 81.305), all nine counties in the AQCR are better than national standards for SO_2, cannot be classified/better than national standards for NO_2, unclassifiable/attainment for PM_{10} and $PM_{2.5}$; maintenance for CO; and nonattainment (marginal) for O_3 (8-hour). Travis AFB is located in AQCR 30.

3.1.4.3 Baseline Air Emissions

An air emissions inventory is an estimate of total mass emissions of pollutants generated from a source or sources over a period of time, typically a year. Accurate air emissions inventories are needed for estimating the relationship between emissions

sources and air quality. Quantities of air pollutants are generally measured in pounds per year or tons per year (tpy). All emission sources may be categorized as either mobile or stationary emission sources. Stationary emission sources may include boilers, generators, fueling operations, industrial processes, and burning activities, among others. Mobile emission sources typically include vehicle operations. Table 3.1-11 lists the baseline air emissions inventory for AQCR 30. Table 3.1-12 presents the emissions from aircraft operations for the basing action assessed in the West Coast C-17 Basing EA. The Proposed Action in the EA included reducing the number of C-5s from 37 to 16 aircraft and adding 13 C-17s at Travis AFB. The number of KC-10 aircraft at the Base was not affected by the C-17 basing action and the Base continues to operate 27 KC-10s. Table 3.1-12 presents the emissions from the C-17, C-5, and KC-10 operations identified for the end state aircraft operations condition at Travis AFB in the West Coast C-17 Basing EA. The table also includes emissions for Navy E-6 and Coast Guard C-130 aircraft based at Travis AFB that were included in the West Coast C-17 Basing EA. Emissions for aircraft operations throughout this EA were calculated using *Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations*, IERA-RS-BR-SR-2001-0010, January 2002 (Revised December 2003).

Table 3.1-11 Baseline Air Emissions Inventory, Air Quality Control Region 30

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
AQCR CY 05 Total	807,636	141,109	199,619	19,710	77,928	33,033

Note: VOC is not a criteria air pollutant. However, VOC is reported because, as an ozone precursor, it is a controlled pollutant. $PM_{2.5}$ included for information only. Data reflected as tons per year.

Source: CARB 2007a.

Table 3.1-12 Emissions from Aircraft Operations Associated with the C-17 Basing Action at Travis AFB

Activity	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Airfield Operations	384	175	1,378	59	104	103

Source: USAF 2007

The BAAQMD has allocated a USEPA-approved 2006 emissions budget for Travis AFB in the SIP. Table 3.1-13 lists the Travis AFB SIP budget for the pollutants of concern.

Table 3.1-13 Travis AFB State Implementation Plan Emissions Budget Levels

CO (tpy)	VOC (tpy)	NO_X (tpy)
4,216	2,383	1,734

Source: BAAQMD 2007.

3.1.5 Biological Resources

Keeler-Wolf (1998) grouped California vernal pools into discrete regional complexes representative of the range of biotic and abiotic features characteristic of ephemeral systems. The Proposed Action at Travis AFB occupies a remnant portion of the Solano-Colusa Vernal Pool Region, characterized by periodic alkaline basins surrounded by upland herbaceous-dominant vegetation of the Sacramento Valley (USFWS 2005). Descriptions of this vernal pool region serve as a regional context for the action area.

The Solano-Colusa Vernal Pool Region is a relatively large area covering the majority of Solano County, ranging northward from the low-lying plains adjacent to the Suisun Marsh and the Sacramento-San Joaquin Delta through the Colusa Basin of western Sacramento Valley to the vicinity of Princeton, Glenn County. It is best known for well-represented examples of Northern claypan pools between Highway 113 and the Base. This is the only known region to contain the ESA-listed (threatened) Delta green ground beetle and the grass *Tuctoria mucronata*, which distinguish this region from any other vernal pool region defined by Keeler-Wolf.

Vernal pools typical of the region are alkaline and may display whitish saline deposits in non-vegetated centers of dry pools. These pools comprise up to several acres and may occur singly or in small aggregations. The pools are often in combinations of small playa-like pools and hogwallow depressions. The few hardpan pools in the region occupy hogwallow topography in areas between Interstate 505 and Highway 5 just north of Vacaville. Soil underlying most of the claypan pools in the vicinity of the Base and Jepson Prairie is Pescadero clay loam or Sycamore series.

Agricultural practices, water diversion and impounding for waterfowl enhancement, development, and road-building have impacted vernal pools in the region. The Solano Land Trust and the California CDFG manage adjacent reserves to protect portions of the Northern claypan type (totaling approximately 2,300 acres). In addition, the Wilcox Ranch, adjacent to the Base on the east, is a preservation area under restricted land use. Many of the pool areas in the region have been converted to agriculture or developed as residential, commercial, or industrial developments. Restoration of some of the less-intensely altered agricultural lands (including old rice fields) are targets for land acquisitions through direct purchases, conservation easements, or other cooperative agreements.

3.1.5.1 Vegetation and Wildlife

The vegetation community found within the action area is best described as a degraded vernal pool/grassland complex. The area may be considered degraded because of (1) alterations of surface and subsurface hydrology, (2) filling in depressional features (vernal pools) and leveling mima-mound topography, (3) dominance of introduced

grasses in upland areas, and (4) current land management activities accomplished under the 2006 Travis AFB BASH Plan (Travis AFB 2006).

Past land use practices and grading activities within the action area included construction of the original airfield that leveled much of the characteristic mima-mound topography. Consequently, many of the vernal pools were either filled in or the surrounding upland area was altered sufficiently to decrease the sheet flow contribution of surface water into remnant pools. Swales are evident within the action area, more so toward the northern portion of the proposed LZ.

The Travis AFB BASH Plan prescribes a vegetation management regime for vegetated areas on the airfield and maintains the vegetation as homogeneously as possible. Travis AFB Airfield Management (*i.e.*, 60 OSS/OSAA) is responsible for ground maintenance of grass height between a minimum of 7 inches to a maximum of 14 inches to reduce attractiveness to wildlife/birds. The BASH Plan does not contain a mowing schedule; however, the Plan mandates that grass should be cut before seed heads develop to avoid attracting grain-eating birds. Most of the grass genera in the action area are considered winter annuals (*Avena, Bromus, Hordeum, Vulpia*), which typically develop seed heads in the mid to late spring, and are fully mature by the onset of the dry season. Therefore, spring mowings are required in the BASH Plan. Stands of brush and shrubs are also removed.

Parsons (2007) categorized the vernal pool / grassland complex into three vegetation community types. These vegetation community types are dispersed along a xeric-mesic gradient, where no distinct boundary between these areas could be defined without quantitative vegetation sampling. Table 3.1-14 lists the three vegetation community types, species observed within each community type, and wetlands indicator codes indexed to each species for the California region (USFWS 1988). Although not intended as an intensive vegetation inventory, the list characterizes the vegetation communities found within the action area. A multispectral satellite image of the action area was acquired (Digital Globe/QuickBird acquisition 2007) concurrent with the wet season of 2006-2007. The image assisted field efforts to characterize vegetation communities in the action area. A companion dry season image was also acquired for the area. The vegetation community types identified are described in the following paragraphs.

- **Upland Annual Grassland Community**

  This community type is dominated by introduced annual grasses associated with agricultural practices (grazing), along with occurrences of non-native and native wildflowers and weedy forbs. The annual grasses germinate with the onset of fall rains, and grow throughout the winter to flower throughout the spring. By summer, the annual grasses have set seed and are desiccated. Most areas within the action area are dominated by soft brome (*Bromus hordeaceus*), rat-tail fescue (*Vulpia myuros*), Italian ryegrass (*Lolium multiflorum*), cheatgrass, ripgut brome

(*Bromus diandrus*), Hardinggrass (*Phalaris tuberosa*), wild oat (*Avena fatua*), and slender oat (*Avena sativa*).

- **Non-Native Grass Seasonal Wetland**

  This community type is found in depressional areas in the action area and is characterized by depressions, swales, or drainage features. These depressional areas hold water for short periods of time relative to active vernal pools found on adjacent properties or the western and southwestern portion of the Base. Many of these areas were once more mesic and perhaps functioned as vernal pools under historical / pre-disturbance hydrological conditions. These mesic depressional prairie areas within the action area are dominated by Italian ryegrass, ripgut brome, wild oat, and filaree (*Erodium* spp.). Other species associated with this community type include soft brome, and Fremont's goldfields and coyote thistle (*Eryngium vaseyi).* The overall habitat quality and species diversity are generally low in these areas relative to true vernal pool habitats (CH2MHill 2006).

- **Vernal Pool Community**

  This community type is found in remnant vernal pools within the action area and is dominated by native annual plants characteristic of northern claypan soil (Sawyer and Keeler-Wolf 1995). These areas typically occur in areas where the basin topography is pronounced and surface water is present for a relatively short duration. Goldfields (*Lasthenia* spp.) were observed in apparent ephemeral depressions, later identified by Collinge (2007) as the common Fremont's goldfield (*L. fremontii*). Other species included ripgut brome, wild oat, Italian ryegrass, filaree, annual hairgrass (*Deschampsia danthonioides*), and rare occurrences of dowingia flower (*Downingia cuspidata*). Vernal pool FL081 is an obvious example of this community type.

Portions of the action area off-Base on the Wilcox Ranch are under deed restrictions that prohibit most kinds of development. This area exhibits mima-mound topography, a relatively higher composition of native plant species and diversity, and is actively grazed by cattle (CH2MHill 2001; TNC 2002). Cattle grazing has been shown to help maintain native and aquatic diversity in vernal pool habitats (Marty 2005). Muzzy Ranch, bordering Wilcox Ranch, also exhibits relatively higher species diversity, and parcels of Muzzy Ranch have been proposed to the U.S. Army Corps of Engineers as a mitigation bank (LSA Associates, Inc. 2004).

Table 3.1-14 Vegetation Community Types and Species Observed within the Action Area

Vegetation Community Type	Common Name	Scientific Name	Origin[1]	Wetlands Indicator Code[2]
Upland Annual Grassland	Soft brome	*Bromus hordeaceus*	Introduced (Europe)	FACU-
	Rat-tail fescue	*Vulpia myuros*	Introduced (Europe)	FACU
	Italian ryegrass	*Lolium multiflorum*	Introduced (Europe)	FAC
	Ripgut brome	*Bromus diandrus*	Introduced (Europe)	FACU
	Hardinggrass	*Phalaris tuberosa*	Introduced (Mediterranean Basin)	FAC+
	Wild oat	*Avena fatua*	Introduced (Africa, Europe, Asia)	UPL
	Slender oat	*Avena sativa*	Introduced (Africa, Europe, Asia)	UPL
Non-Native Grass Seasonal Wetland Community Type	Italian ryegrass	*Lolium multiflorum*	Introduced (Europe)	FAC
	Coyote thistle	*Eryngium vaseyi*	California Native	FACW
	Ripgut brome	*Bromus diandrus*	Introduced (Europe)	FACU
	Wild oat	*Avena fatua*	Introduced (Africa, Europe, Asia)	UPL
	Filaree	*Erodium spp.*	Introduced (Europe)	FACW
Vernal Pool Community Type	Fremont's goldfield	*Lasthenia fremontii*	California Native	OBL
	Wild oat	*Avena fatua*	Introduced (Africa, Europe, Asia)	UPL
	Downingia flower	*Downingia cuspidata*	California Native	OBL
	Italian ryegrass	*Avena fatua*	Introduced (Europe)	FACU
	Filaree	*Erodium spp.*	Introduced (Europe)	FACW
	Coyote thistle	*Eryngium vaseyi*	California Native	FACW
	Annual hairgrass	*Deschampsia danthonioides*	California Native	FACW

NOTES:

[1] *Plant species origins from Crampton (1974), Munz (2004), USDA PLANTS Online Database (last accessed May 2007), and Calflora Database (last accessed May 2007).*

California regional wetland indicator code key (USFWS 1988):

OBL *Obligate wetland plant, occurring almost always (99% probability) under natural conditions in wetlands.*

FACW *Facultative wetland plant, usually occurs in wetlands (67% - 99% probability), but occasionally found in upland areas (1% - 33% probability).*

FAC *Facultative plant, equally likely to occur in wetlands or uplands (34% - 66% probability).*

FACU *Facultative upland plant, usually occurs in uplands (67% - 99%), but occasionally found in wetlands (1% - 33% probability).*

UPL *Obligate upland plant, occurs almost always (99% probability) under natural conditions in upland areas.*

Construction of the Perimeter Road effectively created a long linear berm that apparently facilitates water collection and extends the hydroperiod of depressions adjacent to the road (Parsons 2007). One vernal pool, designated "FL081" by Jennings (2005), is formed primarily by the road, and covers an area of 0.8-acre. Although FL081 is outside the project footprint and is not subject to removal, it is the feature most characteristic of vernal pools still present on Base in the immediate vicinity of the proposed LZ. Neither fairy shrimp nor tadpole shrimp have been observed in this feature when it holds water (CH2MHill 2006; EcoAnalysts 2005). A recent field visit by

Parsons (2007) noted the prolific occurrence of goldfields within FL081, as well as sparse occurrences in swales and remnant ephemeral features within the action area. Collinge (2007) subsequently visited the site and determined that the goldfields within FL081 and throughout the action area are the common Fremont goldfield (*L. fremontii*), not the endangered Contra Costa variety (*L. conjugens*), which supported the 2006 Base-wide summary of occurrences of special status species (CH2MHill 2006). Figure 3-10 shows the distribution of special status species at Travis AFB.

Although FL081 exhibits obvious characteristics of vernal pool hydrology and vegetation and is conspicuous because of its location inside Perimeter Road, other vernal pools were mapped in 2007 within the action area during a wetlands and waters of the United States CWA jurisdictional determination study (CH2MHill 2008). The wetland delineation was performed within an area composed of the proposed LZ runway and was extended to include an additional 300 feet on the northeast and southwest borders. The study identified 2.59 acres of seasonal wetlands and 0.74 acre of vernal pools. In addition the drainage ditch that conveys surface flows into Denverton Creek was also delineated as a wetlands area and amounts to 0.77 acre. Cumulatively, 4.10 acres of wetlands are located within the action area determined to be jurisdictional waters of the United States (CH2MHill 2008). The wetlands and drainage ditches within the action area have a significant nexus to Suisun and Grizzly Bays (navigable waters) via Denverton Creek and Nurse Slough. Previous assessments of the vernal pools and other wetland features within the study area were assessed as insufficient to support conditions for California tiger salamander breeding habitat (Jennings 2005) and T&E invertebrates do not occupy these pools (CH2MHill 2006; EcoAnalysts 2005; CH2MHill 2001; Biosystems Analysis, Inc. 1994). The USFWS confirmed this conclusion in the *Biological Opinion for the Proposed Travis AFB C-17 Landing Strip Project* (USFWS 2008), dated June 12, 2008.

Vernal pools on the relatively undisturbed property adjacent to the Base (Wilcox Ranch) may occur as small ponds in mima-mound topography, or as somewhat larger playas. The Muzzy Ranch, a proposed mitigation bank (LSA Associates, Inc. 2004), also contains similar drainage and wetland features. Denverton Creek drains areas to the north of the Wilcox Ranch, as well as receiving contributing flows routed from the Base. Seasonal flows into Denverton Creek may cause backing up of water, thereby increasing hydrological connectivity to upstream vernal pools. The wetland features and hydrological characteristics of the project area are shown on Figure 3-11.

3.1.5.2 Special Status Species and Critical Habitats

For the purposes of this EA, "special status species" refers to species with regulatory protections under the ESA (USC Title 16 Chapter 35) and the California Endangered Species Act (CESA) (California Fish and Game Code Sections 2050 – 2097), as well as species of concern (see Table 3.1-15). Both ESA and CESA define species that are "threatened" and "endangered" as follows:

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

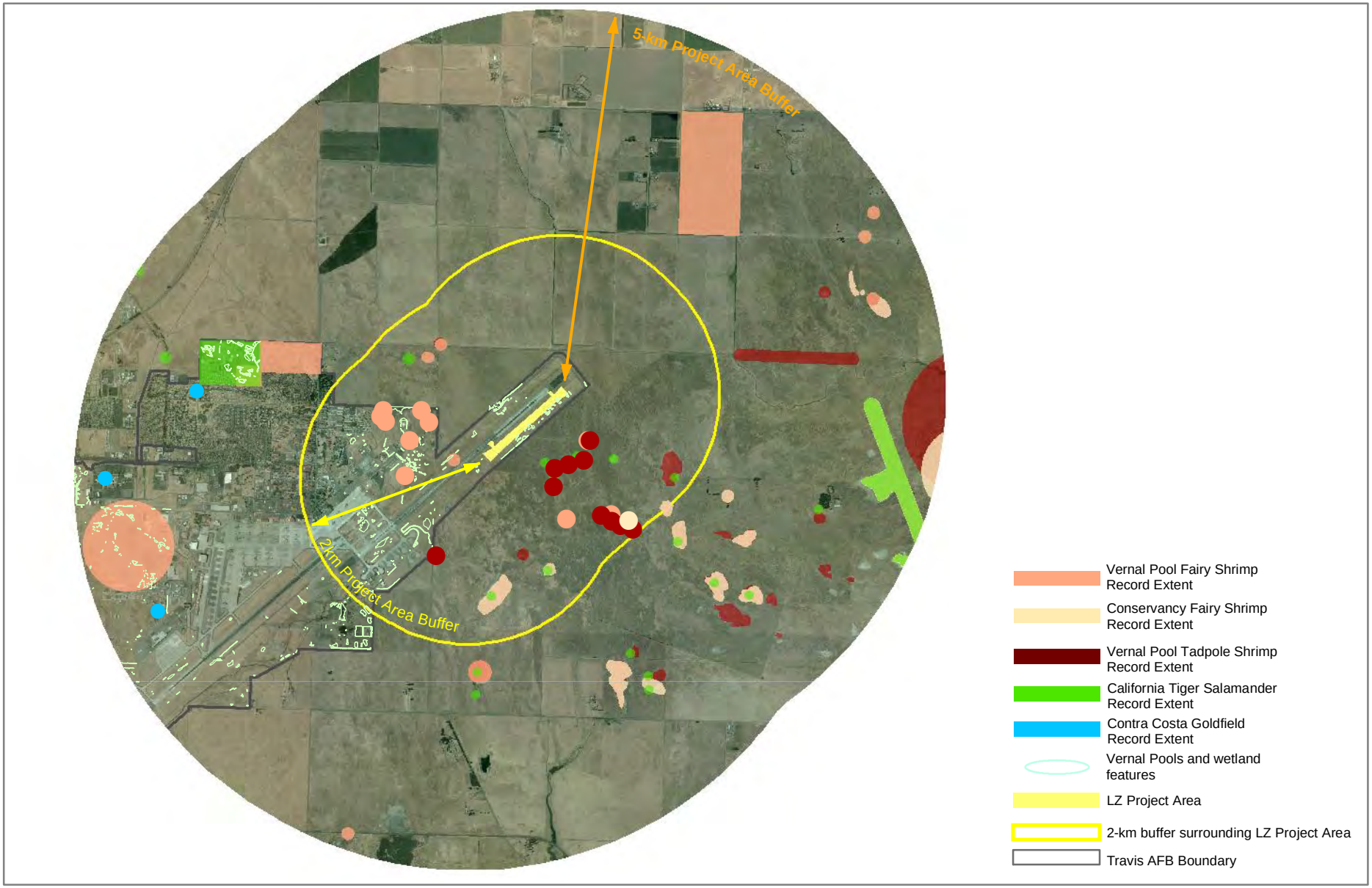
This EA also examines potential impacts to designated Critical Habitat in the project area. ESA defines Critical habitat as the following:

- ***Critical Habitat****:* For listed species, critical habitat consists of (1) the specific areas within the geographical area occupied by the species at the time it is listed in accordance with provisions of Section 4 of the ESA, on which are found those constituent elements (a) essential to the conservation of the species, and (b) that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed (50 CFR 17.1).

3.1.6 Cultural Resources

Cultural resources include prehistoric and historical archaeological sites, buildings, structures, districts, artifacts, objects, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, or religious purposes. Pursuant to Section 106 of the NHPA of 1966, as amended, and its implementing regulations at 36 CFR 800, federal agencies must take into consideration the potential effect of an undertaking on "historic properties," which refers to cultural resources listed in, or eligible for inclusion in, the NRHP. Sites not yet evaluated are considered potentially eligible for inclusion in the NRHP and, as such, are afforded the same regulatory consideration as nominated properties.

Numerous laws and regulations require federal agencies consider the effects of a proposed action on cultural resources. These laws and regulations stipulate a process for compliance, define the responsibilities of the federal agency proposing the action, and prescribe the relationship between other involved agencies (*e.g.*, State Offices of Historic Preservation, the Advisory Council on Historic Preservation). Only those cultural resources determined to be significant under cultural resource legislation are subject to protection or consideration by a federal agency. The quality of significance is considered in terms of applicability of the NRHP criteria. Significant cultural resources, either prehistoric or historic in age, are referred to as "historic properties."



Sources:
(1) National Agricultural Imagery Program (NAIP) 2004 mosaic image of Solano County.
(2) California Natural Diversity Database (CNDDB) Accessed in March 2007.
(3) LSA 2004. Preliminary Bank Proposal, Muzzy Ranch Mitigation Bank

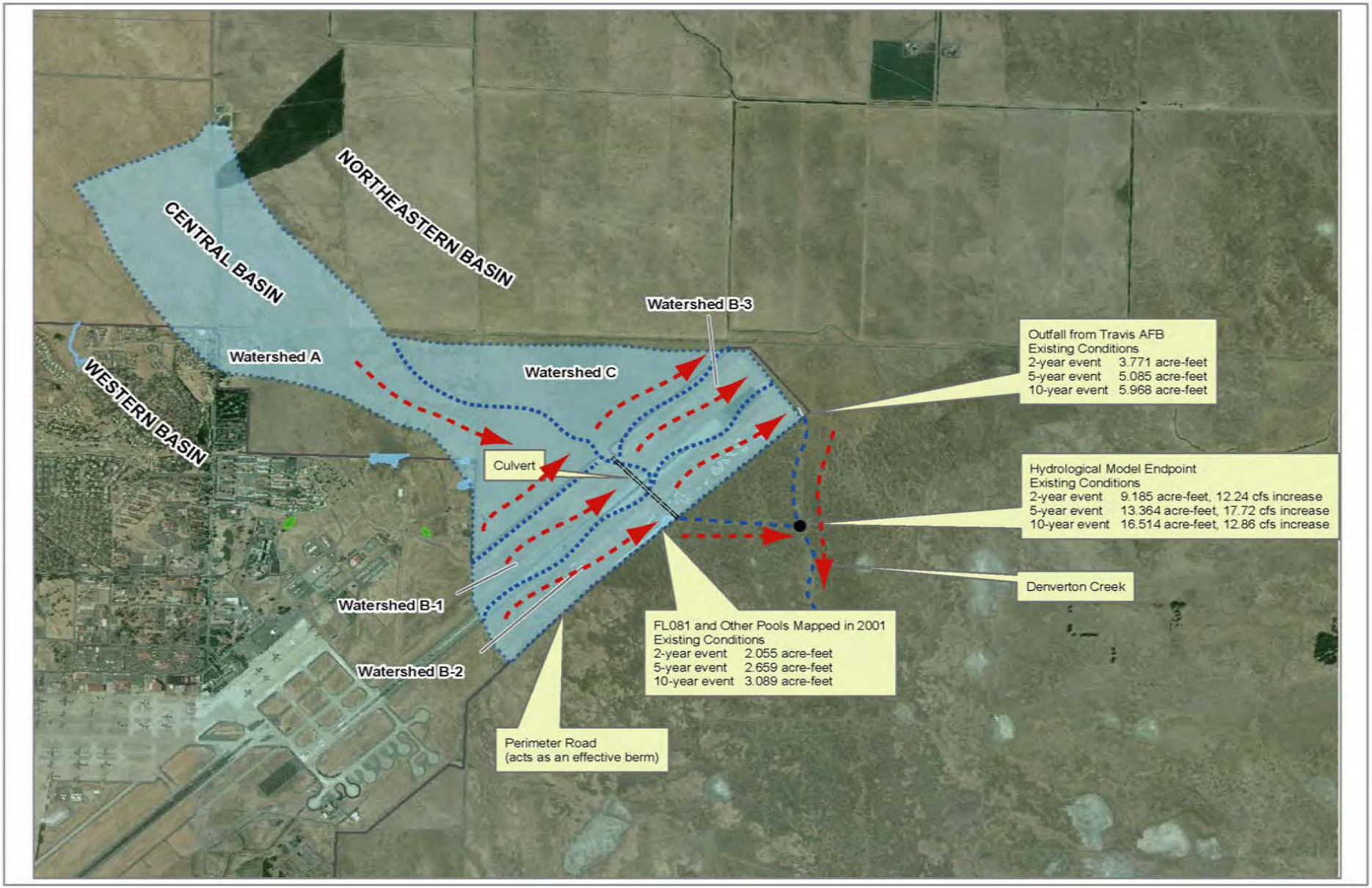
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Distribution of Special Status Species, Travis AFB

Figure 3-10

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Ephemeral wetlands extents (CH2MHill 2001)

Central Basin (Contributing Basin), component watersheds

Flow direction

Sources:
(1) National Agricultural Imagery Program (NAIP) 2004 mosaic image of Solano County.
(2) Hydrological Analysis (included as Appendix B)

N

0 3,0 00 6,0 00 Feet

Hydrology and Vernal Pools, Travis AFB

Figure 3-11

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Table 3.1-15 Special Status Species

Taxonomic Group	Common Name	Scientific Name	Listing Status		Habitat Present or Known Occurrence within Action Area	Critical Habitat on or Adjacent to Action Area[3]
			Federal	State		
Plants	Suisun thistle	*Cirsium hydrophilum* var. *hydrophilum*	Proposed Threatened	-	No	No
	Soft bird's-beak	*Cordylanthus mollis mollis*	Endangered	Rare	No	No
	Contra Costa goldfields	*Lasthenia conjugens*	Endangered	-	Habitat present, Species unlikely present	Yes
	Colusa grass	*Neostapfia colusana*	Threatened	Endangered	No	No
	San Joaquin Valley Orcutt grass	*Orcuttia inaequalis*	Threatened	Endangered	No	No
	Solano grass	*Tuctoria mucronata*	Threatened	Endangered	No	No
	Showy indian clover	*Trifolium amoenum*	-	Species of Concern	Habitat present. Species unlikely present	-
	Boggs Lake hedge-hyssop	*Gratiola heterosepala*	-	Endangered	No	-
Invertebrates	Conservancy fairy shrimp	*Branchinecta conservatio*	Endangered	-	Habitat present. Species occurs on adjacent Wilcox Ranch. Species not found in vernal pools on the Base (CH2MHill 2006).	Yes
	Vernal pool fairy shrimp	*Branchinecta lynchi*	Threatened	-	Habitat present. Species occurs on the Base and adjacent Wilcox Ranch. Species not found in vernal pools in the action area (CH2MHill 2006)	Yes

Table 3.1-15 Special Status Species (*continued*)

Taxonomic Group	Common Name	Scientific Name	Listing Status		Habitat Present or Known Occurrence within Action Area	Critical Habitat on or Adjacent to Action Area[3]
			Federal	State		
Invertebrates	Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	Threatened	-	No	No
	Delta green ground beetle	*Elaphrus viridis*	Threatened	-	Habitat present. Species does not occur on the Base, but is found on adjacent Wilcox Ranch. Species not found in vernal pools in the action area (CH2MHill 2006)	No
	Vernal pool tadpole shrimp	*Lepidurus packardi*	Endangered	-	Habitat present. Species may occur on the Base and does occur on adjacent Wilcox Ranch. Species not found in vernal pools in the action area (CH2MHill 2006)	Yes
Fishes	Green sturgeon	*Acipener medirostris*	Threatened	-	No	No
	Delta smelt	*Hypomesus transpacificus*	Threatened	Threatened	No	No
	Central Valley Chinook salmon	*Oncorhynchus tshawytscha*	Threatened[1] / Endangered[2]	Threatened[1] / Endangered[2]	No	No
	Central Valley steelhead	*Oncorhynchus mykiss*	Threatened	-	No	No
Amphibians	California tiger salamander	*Ambystoma californiense*	Threatened	-	Upland habitat present, breeding habitat unlikely.	Yes
	California red-legged frog	*Rana aurora draytonii*	Threatened	Threatened	No	No
Reptiles	Giant garter snake	*Thamnophis gigas*	Threatened	Threatened	No	No
Birds	California clapper rail	*Rallus longirostris obsoletus*	Endangered	Endangered	No	No
	California black rail	*Laterallus jamaicensis coturniculus*	-	Threatened	No	-
	Swainson's hawk	*Buteo swainsoni*	-	Threatened	Habitat present, species unlikely present	-
Mammals	Silver marsh harvest mouse	*Reithrodontomys raviventris*	Endangered	Endangered	No	No

1 Spring-run salmon, designated as Threatened
2 Winter-run salmon in the Sacramento River, designated as Endangered
3 Applies only to federally listed species.

Cultural resources on Air Force installations are managed in accordance with environmental laws and regulations that include: AFI 32-7065, *Cultural Resources Management*; 32 CFR 989; EO 11593 of 1971; NHPA of 1966, as amended; Archaeological and Historic Preservation Act of 1974 (Public Law [PL] 93-291); the Archaeological Resources Protection Act of 1979 (PL 96-95); the American Indian Religious Freedom Act (AIRFA) of 1978 (PL 95-341); and, the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (PL 101-601). In addition, any proposed undertaking must comply with the State Historic Preservation Office (SHPO) guidelines.

For this analysis, the ROI is synonymous with the Area of Potential Effect, as defined by the NHPA, and includes all areas subject to alteration and/or disturbance to construct the permanent LZs as defined in Chapter 2. The ROI for the Proposed Action at Travis AFB is composed solely of the built environment (*i.e.*, airfield). One hundred percent of the ROI on Travis AFB has been previously disturbed by some form of construction activity.

Identification of cultural resources potentially impacted by the Proposed Action was accomplished by reviewing the 2003 Travis AFB Integrated Cultural Resources Management Plan (ICRMP) (USAF 2003c) and the National Register Information System (NRIS) (NPS 2007a). A total of 19 cultural resource investigations have been conducted on or near Travis AFB since 1909. Three of these cultural resources investigations were conducted within or adjacent to the ROI on Travis AFB, as identified on Table 3.1-16.

Table 3.1-16 Previous Cultural Resources Investigations Within or Adjacent to the Travis AFB Region of Influence

Year	Study
1980	North Bay Aqueduct Alignment Evaluation
1995	Section 110 Base-Wide Cultural Resources Inventory
1996	Travis Air Force Base, California: Inventory of Cold War Properties

Source: USAF 2003c.

3.1.6.1 Archaeological Resources

Archaeological resources are prehistoric or historic places where human activity has measurably altered the earth or left deposits of physical remains. Archaeological resources may include some surface deposits and below ground (subsurface) deposits. Prehistoric archaeological resources may include village sites, campsites, lithic scatters, burials, hearths (or hearth features), processing sites, caves, and rock shelters. Historical archaeological resources may include farmsteads, roads, privies, trash deposits, and/or middens.

The 2003 Travis AFB ICRMP Update (USAF 2003c) identified ten archaeological sites on the base, as shown on Table 3.1-17. The sites consisted of three prehistoric

archaeological sites and seven historical archaeological sites. None of the seven historical archaeological sites are eligible for the NRHP and none require further investigation.

Table 3.1-17 Archaeological Sites on Travis AFB

Site	Description	Occupation Date	Status
CA-Sol-313	Lithic site	Unknown	Considered disturbed; destroyed for construction of David Grant Medical Center.
CA-Sol-314	Lithic site	Unknown	Data recovery conducted; destroyed for construction of David Grant Medical Center.
CA-CCo-252	Shell midden	Unknown	Either destroyed or located off the Base
CA-Sol-383/H	Historic road	Early 20th century	Unknown
TAFB-H-02	Farmstead	Late 19th century	Not NRHP Eligible
TAFB-H-03	Farmstead	Late 19th century	Not NRHP Eligible
TAFB-H-05	Farmstead	Late 19th century	Not NRHP Eligible
TAFB-H-11	Farmstead	Disturbed/Unknown	Not NRHP Eligible
TAFB-H-18	Farmstead	Early 20th Century	Not NRHP Eligible
Golf Course	Farmstead	Early 20th Century	Not NRHP Eligible

Source: USAF 2003c

3.1.6.2 Historical Resources

For purposes of this analysis, historical resources include buildings and structures and other physical remains of historic significance present above the ground. Historical resources date from the period of initial European contact in this area (*circa* A.D. 1775) and extend to the present. These may include houses, homesteads, farmsteads (and associated support structures or buildings), cabins, forts, schools, bridges, dams, logging sites, military facilities, structures, or buildings, and items of a similar nature.

Travis AFB was originally established as Fairfield-Suisun Army Air Base in 1942 (Travis Air Museum 2007a). Fairfield-Suisun Army Air Base was assigned to the Air Tactical Command whose primary mission was to service and ferry tactical aircraft from California across the Pacific Ocean to the war zone. By 1945, the Base's primary mission was the airlift of troops and supplies to occupied Japan and Korea, and the processing of American troops headed home. In 1946, the Military Air Transport Service assumed jurisdiction. In 1949, the Strategic Air Command became the major command at the base with a long-range reconnaissance and intercontinental bombing mission (Travis Air Museum 2007a). In 1950, Fairfield-Suisun Army Air Base was renamed Travis AFB in honor of Brigadier General Robert F. Travis who was killed in a B-29 crash (Travis Air Museum 2007b). The Military Air Transport Service resumed command at Travis AFB in 1958. Travis AFB became part of the Air Mobility Command in 1992 (Travis Air Museum 2007a).

Historic buildings on Travis AFB include military housing, World War II-era structures, and Cold War Era buildings, as described in the following paragraphs:

- A total of 546 Wherry-Capehart housing units constructed in 1958. These structures were evaluated for eligibility in the NRHP and are not considered properties of particular importance.
- A total of 39 World War II-era structures. The California SHPO concurred with the determination that none of these structures have strong association with significant events or persons, are architecturally significant, or retain sufficient integrity for inclusion in the NRHP (USAF 2003c).
- A total of 27 historic properties associated with the Cold War Era have been determined to be potentially eligible for inclusion in the NRHP. Potentially eligible and non-eligible Cold War Era historic buildings are identified in Table 3.1-18. The preliminary findings for eligibility of Cold War Era historic buildings shown on Table 3.1-18 are pending Air Force concurrence and further study (USAF 2003c).

Table 3.1-18 Cold War Era Historic Resources on Travis AFB

Bldg.	Original Use	Year Built	NRHP Status
AFSWP Q Area			
902	Base Spares Office	1951-53	P
903	Storage, C Structure	1951-53	P
904	Base Spares Warehouse #1	1951-53	P
905	Base Spares Warehouse #2	1951-53	P
906	Base Spares Warehouse	1951-53	P
908	Supply and Issue Shop	1953-54	P
909	Special Weapons Readiness Crew Facility	1956-57	P
912	Base Communications Office	1956-57	P
915	Hazardous Substances Warehouses (2)	1956-57	P
916	Emergency Electrical Power Plant	1951-53	P
930	Readiness Crew & Operations Facility	1951-53	P
931	Heavy Equipment Shop	1951-53	P
932	Surveillance and Inspection Shop	1951-53	P
933	Surveillance and Inspection Shop	1951-53	P
934	Surveillance and Inspection Shop	1951-53	P
935	Surveillance and Inspection Shop	1951-53	P
936	Surveillance and Inspection Shop	1951-53	P
AFSWP Q Area			
937	Power Station	1951-53	P
938	Base Spares Warehouse	1958-59	P
940	Paint Shop	1959-60	P
942	Surveillance and Inspection Shop	1955-56	P
943	Surveillance and Inspection Shop	1955-56	P
944	Base Spares Warehouse	1958-59	P
956	Special Weapons Storage Igloo	1951-52	NE
958	Special Weapons Storage Igloo	1951-52	NE
966	Special Weapons Storage Igloo	1951-52	NE
968	Special Weapons Storage Igloo	1951-52	NE
976	Special Weapons Storage Igloo	1951-52	NE
978	Special Weapons Storage Igloo	1951-52	NE
1944	Radioactive Waste Burial Site	1950s	NE
1947	Radioactive Waste Burial Site		NE

Table 3.1-18 Cold War Era Historic Resources on Travis AFB (*continued*)

Bldg.	Original Use	Year Built	NRHP Status
ADC Alert and Readiness Area			
369	ADC Flight Simulator Training	1955	P
1205	ADC Readiness/Maintenance Hangar	1953	P
1212	Unit A, Rocket Checkout/Assembly	1954-55	P
366	Liquid Fuel Pump Station	1953	NE
1202	Alert Hangar	1952-54	NE
1772	Liquid Fuel Storage Tank	ca. 1954	NE
Bldg 810			
810	Double-cantilever, B-36 Bomber Hangar	1952	P

Source: USAF 2003c.
P Potentially Eligible.
NE Not Eligible.

Two Cold War historic resources located within or adjacent to the ROI for the Alternative Action on Travis AFB and that retain integrity, have been recommended as eligible for inclusion in the NRHP as National Register districts or on individual merit. These properties are located in the AFSWP Q Area, the Air Defense Command (ADC) Alert and Readiness Area, and Building 810 (see Table 3.1-18) (USAF 2003c).

- Building 1212, the Unit A Rocket Checkout/Assembly building built between 1954 and 1955, is located within the ADC Alert and Readiness Area. Building 1212 is potentially eligible for listing on the NRHP and was defined as a contributing building to the proposed ADC Readiness Area Historic District. The ADC Alert and Readiness Area is recommended as potentially eligible under Criterion C and Criteria Consideration G (as demonstrating exceptional significance for a property under 50 years in age). The proposed six-building ADC Alert and Readiness Area Historical District is an excellent example of the programmatic ADC areas built in a standardized configuration throughout the United States in the 1950s. The area is associated with the high tactical role that ADC Readiness Areas played in Air Force air defense during those years. The ADC Readiness Area at Travis AFB is a coherent cluster of buildings and structures with little exterior modification and with no site infill since 1960. The proposed historic district boundary is recommended to immediately circumscribe Buildings 369, 1205, and 1212 (USAF 2003c). Building 1212 was recently modified.
- Building 810, which was recommended as potentially eligible for the NRHP, is an oversized steel frame and open-truss aircraft hangar that formerly housed B-36 bombers beginning in 1951. The B-36 was the first intercontinental bomber with a 10,000-mile traveling range. Building 810 is one of the first double cantilever medium bomber hangars built in the United States and displays few exterior modifications (USAF 2003c).

3.1.6.3 Native American Interests

Native American resources can include, but are not limited to, archaeological sites, burial sites, ceremonial areas, caves, mountains, water sources, trails, plant habitat or

gathering areas, or any other natural area important to a culture for religious or heritage reasons. NRHP-eligible traditional sites are subject to the same regulations, and afforded the same protection, as other types of historic properties. The ROI for Native American traditional resources consists of those areas associated with project activities at Travis AFB.

Early and effective participation of Native American tribes and groups is an integral component to the successful completion of the Section 106 process. As part of the preparation of the Travis AFB ICRMP, the Air Force contacted Native American groups in July 2002 to request background information regarding prehistoric, historic, and ethnographic land use, as well as information regarding contemporary Native American values or concerns on Travis AFB. No responses were received by the Base (USAF 2003c). There is no evidence that any Native American burial grounds or sacred areas are located on Travis AFB that would be subject to the provisions of AIRFA or NAGPRA (USAF 2003c).

Four Native American groups that could be affected by the Proposed Action at Travis AFB were identified by the California Native American Heritage Commission and the Base (Table 3.1-19). As lead federal agency, the Air Force initiated consultation with four Native American groups, pursuant to 36 CFR 800.2, and to ensure that any sites of traditional cultural value are identified and adequately considered under the Alternative Action. The Air Force sent correspondence to the tribes announcing the action and requesting concerns regarding the Proposed Action (see Appendix E).

Table 3.1-19 Native American Groups Identified for Travis AFB

State	Tribal Name
California	Cortina Band of Indians
	Rumsey Rancheria
	Wintun Environmental Protection Agency
	Wintun/Patwin (Kesner Flores)

3.2 SOUTHERN CALIFORNIA LOGISTICS AIRPORT

3.2.1 Aircraft Operations, Aircraft Safety, and Bird/Wildlife-Aircraft Strike Hazard

3.2.1.1 Aircraft Operations

The background information in Subchapter 3.1.1.1 concerning airspace and flight pattern locations also applies to the SCLA. Radar vectoring, sequencing, and separation service between participating VFR and all IFR aircraft operating within the airspace around the SCLA and aircraft arriving and departing the airport is provided by High Desert Terminal Radar Approach Control (TRACON). The TRACON controls the airspace up to 13,000 feet above MSL. The SCLA air traffic control tower controls the airspace to about 5.5 miles from the airport and up to 5,400 feet MSL (2,500 feet AGL).

There are eight public and private use airports in the area around the SCLA. Five low-altitude federal airways pass within 20 miles of the airport.

The SCLA has two runways, 17/35 and 03/21. Runway 17/35 is 15,050 feet long and 150 feet wide and Runway 03/21 is 9,138 feet long and 150 feet wide. The airfield elevation is 2,885 feet MSL and the air traffic control tower operates from 6:00 a.m. to 10:00 p.m., seven days a week. There are three instrument approaches available for arrivals to the airfield. Tower-controlled traffic patterns are flown on both sides of the runways at 1,000 feet AGL.

Of the 15 types of aircraft operating at the SCLA, the greatest number of operations are accomplished by single engine, small turboprop, helicopter, and business jet aircraft. C-17s accomplish about five operations per day. Table 2.2-2 presents the average daily and total annual operations at the SCLA.

FAA Advisory Circular AC 50/5060-5, *Airport Capacity and Delay*, is used to calculate airfield operations capacities for civil airports. Capacity determination takes into account: runway configuration; the number of arrivals and departures; the number of touch and go operations; the number and configuration of taxiways intersecting the runways; airspace limitations that could restrict aircraft operations at the airport; and, air traffic control facilities and services. Using these factors, the annual service volume and hourly capacities of an airfield are calculated. The annual service volume is a reasonable estimate of an airports annual capacity. Hourly capacity is the maximum number of aircraft operations that can be accommodated at the airport in an hour.

Based in the information in the AC 50/5060-5, it is estimated the SCLA airfield has an annual service volume of 260,000 operations and an IFR hourly capacity of approximately 59 airfield operations. Assuming nearly all operations occur primarily between 6:00 a.m. and 10:00 p.m., there would be 15 hours of operations per day for hourly capacity purposes. The baseline annual 56,714 operations equate to about 22 percent of the annual airfield capacity. Based on a 15-hour day, the average hourly operations would be about 10 operations, or 18 percent of the hourly capacity.

3.2.1.2 Aircraft Safety

An aircraft accident, as defined by the National Transportation Safety Board, is an occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage. Although "death" is easily understood, the rule provides specific definitions for the terms "serious injury" and "substantial damage." A "serious injury" is defined by the National Transportation Safety Board as "…any injury which: (1) requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; (2) results in a fracture of any bone (except simple fractures of fingers, toes, or nose); (3) causes severe hemorrhages, nerve, muscle,

or tendon damage; (4) involves any internal organ; or (5) involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface."

Substantial damage means damage or failure that adversely affects the structural strength, performance, or flight characteristics of the aircraft, and which would normally require major repair or replacement of the affected component. Substantial damage does not include: engine failure or damage limited to an engine if only one engine fails or is damaged, bent fairings or cowling, dented skin, small punctured holes in the skin or fabric, ground damage to rotor or propeller blades, and damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips.

An "incident" is defined as an occurrence other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operations. An incident involving a small aircraft need not be reported except when it involves: (1) flight control system malfunction or failure; (2) inability of any required flight crewmember to perform normal flight duties as a result of injury or illness; (3) failure of structural components of a turbine engine excluding compressor and turbine blades and vanes; (4) in-flight fire; or (5) aircraft collide in flight; (6) damage to property, other than the aircraft, estimated to exceed $25,000 for repair (including materials and labor) or fair market value in the event of total loss, whichever is less.

Incidents involving large, multi-engine aircraft (more than 12,500 pounds maximum certificated takeoff weight) must be reported if they involve: (1) in-flight failure of electrical systems that requires the sustained use of an emergency bus powered by a back-up source such as a battery, auxiliary power unit, or air-driven generator to retain flight control or essential instruments; (2) in-flight failure of hydraulic systems that results in sustained reliance on the sole remaining hydraulic or mechanical system for movement of flight control surfaces; (3) sustained loss of the power or thrust produced by two or more engines; and (4) an evacuation of an aircraft in which an emergency egress system is utilized.

Table 3.2-1 lists accident and incident data for the period 2002-2006 for the civil aircraft that operate at the SCLA. The estimated annual average accident/incident rate appears relatively high for certain general aviation aircraft because these models have lower reported airtime information. The Cessna 172, for example, has exhibited relatively high accident rates over the five-year reporting period, but is also no longer used as frequently as during earlier years. From 2002 to 2006, airtime for the Cessna 172 has dropped by approximately 90 percent. Subchapter 3.1.1.2 discusses the Air Force aircraft safety program.

Table 3.2-1 Civil Aircraft Accident and Incident Information

Type	Aircraft	Representative Model(s)	Accidents	Incidents	Average Annual Accident/Incident Rate (per 100,000 airtime hours)
Air Carrier	B-727	Boeing 727-100, 727-100c/Qc, 727-200/231a	6	0	0.803
	B-737	Boeing 737-700/700lr, 737-900, 737-800, 737-5/600lr, 737-5/600lr, 737-500, 737-400, 737-300, 737-100/200, 737-200c	26	22	0.031
	B-747	Boeing 747-100, 747-100, 747-200/300, 747-400, 747f	5	3	0.218
	B-767	Boeing 767-400, 767-200/Er/Em	3	2	0.016
	B-777	Boeing 777-200/200lr/233lr	5	1	0.208
	DC-9	McDonnell Douglas Dc-9-10, Dc-9-15f, Dc-9-30, Dc-9-40, Dc-9-50	13	5	0.102
	MD-83	McDonnell Douglas DC9 Super 80/Md81/2/3/7/8	1	1	0.003
Helicopter	Bell 21 2	Bell 212, Bell B-206a, Bell 212HP and Bell BH-212	5	1	14.534
General Aviation	C-210	Cessna 206/207/209/210 Stationair	207	1	6.994
	Beech Baron	Beech 55, 95-C55, B55, E-55, 95-55, BE-95-55, 95B55	47	1	378.685
		Beech 58, BE-58, 58P, BE-58, 58TC	36	2	nd
	Cessna Turboprop	Cessna 441	7	0	nd
	DHC-6	Dehavilland Twin Otter DHC-6	9	0	0.525
	Gulfstream II	Gulfstream Aerospace G-III	1	0	ND
	Gulfstream IV	Gulfstream Aerospace G-IV	4	0	ND
	Learjet 35	Gates Learjet Lear-25	11	0	ID
	Single Engine Fixed Pitch Propeller	Cessna 172, C-172N, C-172S, C-172G and C-172M	844	7	517.780
	Single Engine Variable Pitch Propeller	Beech 24, Beech 23 Musketeer	19	0	ID

Note: Accident/Incident data reflect records from January 1, 2002 through January 1, 2007 and 5 years of airtime data from 2002 through November 2006 (11 months only for 2006). Data excludes 2006 airtime information for the DC-9 aircraft.

ND = airtime data not available for aircraft type. ID=insufficient airtime to compute a valid accident rate.

Sources: National Transportation Safety Board 2007; BTS 2007.

3.2.1.3 Bird/Wildlife-Aircraft Strike Hazard

The BASH information in Subchapter 3.1.1.3 also applies to the SCLA.

3.2.2 Noise

Aviation-related activities at the SCLA dominate the acoustic environment. The noise definition information in Subchapter 3.1.2 also applies to the SCLA

3.2.2.1 Noise Metrics and Analysis Methods

The single event and averaged noise metrics and noise analysis methods information for Travis AFB in Subchapter 3.1.2.1 also apply to the SCLA.

3.2.2.2 Baseline Noise Analysis

Single Event Noise Analysis

Table 3.2-2 lists the SEL and L_{max} values for the noisier aircraft that operate at the SCLA at takeoff power and at varying slant range distances from the aircraft.

Table 3.2-2 Aircraft Noise Levels in Maximum Sound Level and Maximum Sound Level as a Function of Slant Range Distance from Aircraft, Southern California Logistics Airport

Aircraft	200 Feet	300 Feet	500 Feet	1,000 Feet	2,000 Feet
SEL					
B-727	118	115	111	106	93
B-737-300	105	103	99	94	88
B-747-200	116	113	109	103	96
MD-83	109	107	103	98	92
Lmax					
B-727	115	111	106	99	81
B-737-300	102	98	93	86	79
B-747-200	114	110	104	96	88
MD-83	107	104	99	92	84

Note: Values reflect dBA.

Averaged Noise Analysis

The primary source of noise in the vicinity of the SCLA is airfield operations. Baseline noise conditions are based on the average daily airfield operations shown on Table 2.2-2 (No Action Alternative). About 155 average daily airfield operations occur at the SCLA under the baseline condition. Figure 3-12 shows the baseline condition aircraft ground tracks, and Figure 3-13 depicts the noise exposure area for the baseline. These two figures depicting the baseline condition were prepared by running NOISEMAP version 7.296 with the flight track, profile, and aircraft operations data from the Integrated Noise Model (INM) file that was used to prepare noise contours for an update to the SCLA airport master plan (SCLA 2005). NOISEMAP and INM are the two USEPA-approved computer noise models. INM is used by the FAA for noise analysis at civil airports. The NOISEMAP and INM programs are similar; however, INM is specifically designed to model aircraft flight operations at civil airports.

Table 3.2-3 lists the number of acres (land area off-airport), the number of people within the CNEL 60 dBA and greater noise exposure area, and the estimated number of people who might be potentially highly annoyed by noise at those levels. None of the estimated 12,436 persons (based on 2000 census data) who live within the approximate 5-mile radius area associated with airfield airspace environment would be exposed to CNEL 60 dBA and greater.

Table 3.2-3 Baseline Noise Exposure, Southern California Logistics Airport

	CNEL Interval (dBA)					
Category	**60-65**	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres	284	11	0	0	0	295
People	0	0	0	0	0	0
People Potentially Highly Annoyed	0	0	0	0	0	0

Note: Acres reflect only off-Base land area. Population data used to determine the number of people within a noise zone were obtained from the United States Census Bureau 2000 census. It was assumed that population was equally distributed within a census tract area to estimate affected population. Using the noise contour information, the number of acres of land in each noise zone (e.g., CNEL 60-65 dBA, 65-70 dBA, 70-75 dBA, 75-80 dBA, and 80 dBA and greater) were divided by the number of acres of land in each census block to determine the portion of the census tract within each noise zone. The population total in each block-group was then multiplied by this ratio to estimate affected population within each zone. This process was used throughout the EA. People highly annoyed were determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1-4

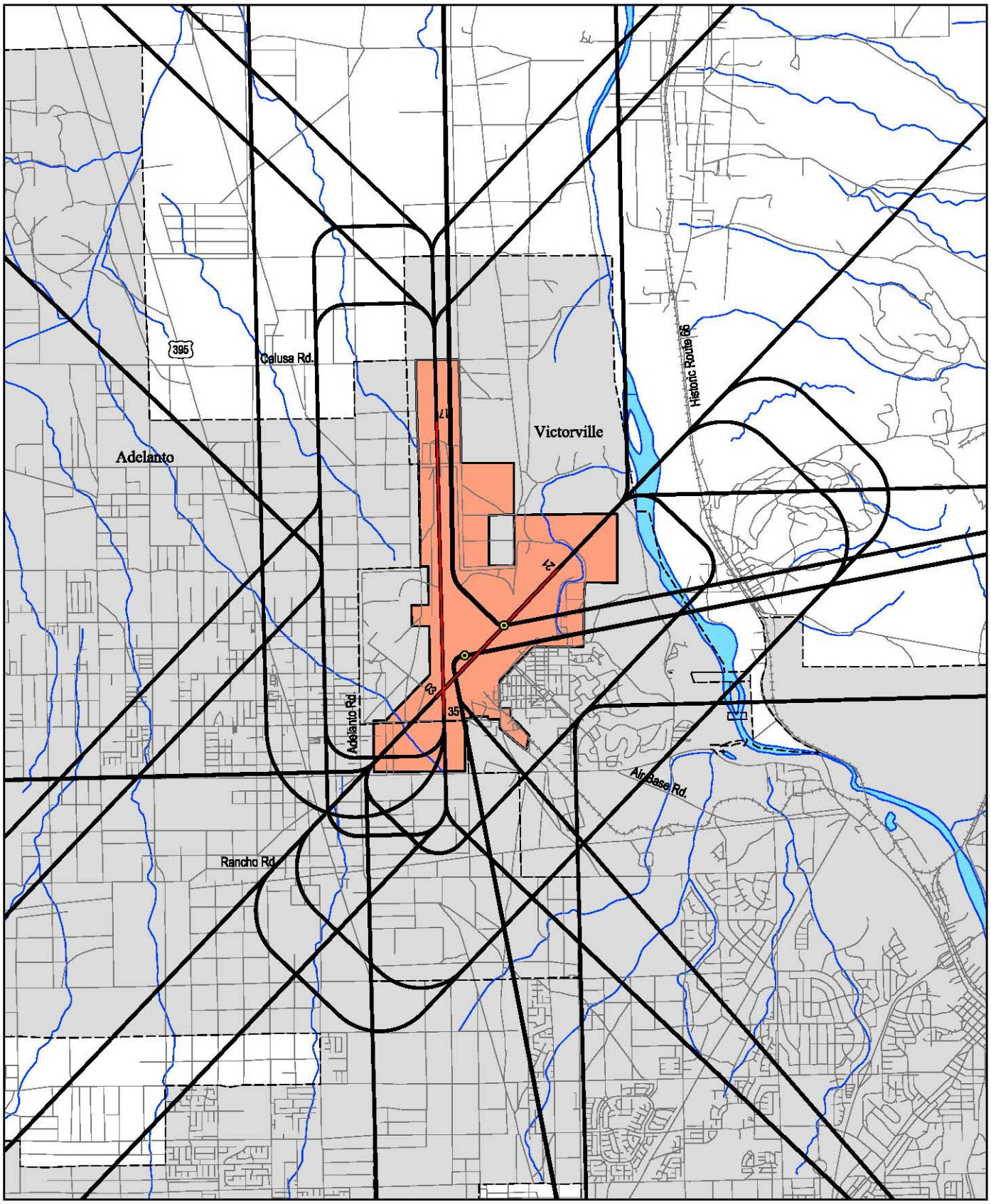
Effect of Aircraft Noise on Structures

The discussion of the effects of noise on structures for Travis AFB in Subchapter 3.1.2.2 also applies to the SCLA. Table 3.2-2 presents the L_{max} for the noisier aircraft operating at the SCLA. The aircraft producing the greatest maximum sound levels is the B-727, which produces 115 dBA at 200 feet AGL. These sound levels would be below the level at which damage to structures would be anticipated (*i.e.*, 127 dBA).

3.2.3 Land Use

The City of Victorville prepared a *Southern California Logistics Airport Community Plan Element* (Community Plan Element) as a guide for development and reuse of the deactivated George AFB for commercial aviation and other compatible uses. The purpose of the Community Plan Element is to promote the development of compatible land uses in the area influenced by airport operation, to safeguard the general welfare of the inhabitants within the vicinity of the airport by minimizing exposure to excessive noise levels, and to safeguard the welfare of the inhabitants within the vicinity of the airport by imposing appropriate restrictions on new development for the protection of aircraft operations (City of Victorville undated a).

The Community Plan Element contains five on-airport land use designations: airport and support facility; business park; industrial; runway protection zone (RPZ); and public/open space. The Community Plan Element also establishes safety review areas within one mile of the airport due to the potential for accidents to aircraft in the patterns. Land use compatibility within the safety review areas are based on FAR Part 77 guidelines (City of Victorville undated a).



Southern California Logistics Airport

LEGEND

- Ground Track
- Runway
- Roadway
- City Limits
- Drop Zone
- Southern California Logistics Airport

N

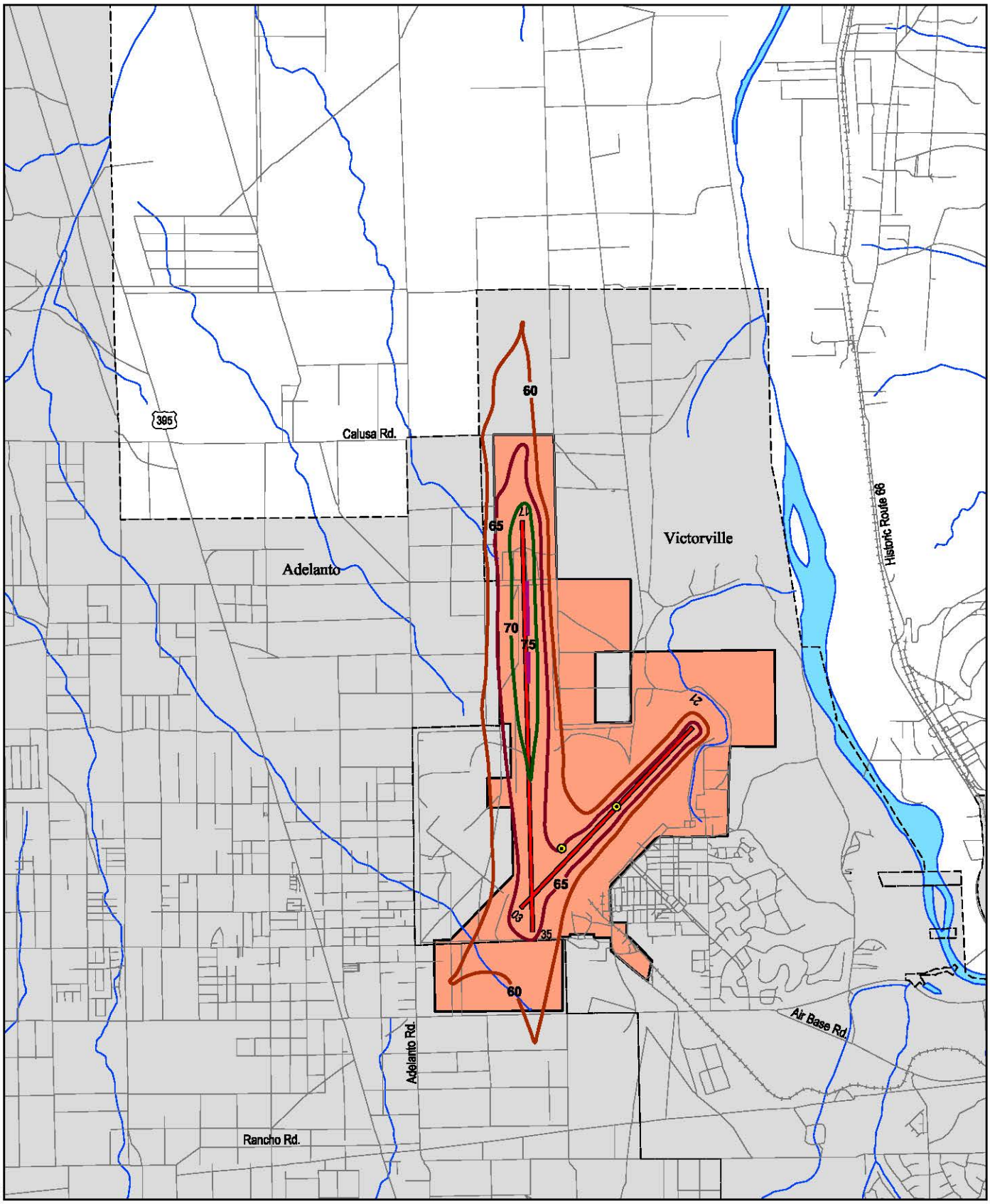
0 7,000 Feet

Baseline Aircraft Ground Tracks, Southern California Logistics Airport

Figure 3-12

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Southern California Logistics Airport

LEGEND

- CNEL 60 dB Contour
- CNEL 65 dB Contour
- CNEL 70 dB Contour
- CNEL 75 dB Contour
- CNEL 80 dB Contour
- Runway
- Roadway
- City Limits
- Drop Zone
- Southern California Logistics Airport

N

0 5,000 Feet

Baseline Noise Contours, Southern California Logistics Airport

Figure 3-13

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Off-airport land use in the area surrounding the SCLA is primarily open except for the City of Adelanto, which is about half a mile from the southwest boundary of the airport.

The City of Victorville has prepared a Comprehensive Airport Land Use Plan. The intent of the Plan is to use land use control mechanisms such as zoning and subdivision ordinances to reduce the potential for or affects of an aircraft accident. These mechanisms would minimize the number of fatalities on the ground if an accident does occur. The degree of risk or level of exposure is reflected by the creation of three safety review areas (City of Victorville undated b).

- Safety Review Area 1. This area is centered on each runway at a width of 1,000 feet and extends past each end of the runway, extending outward horizontally 1,700 feet and 2,500 feet. While it is desirable to clear all objects and land uses from this Safety Review Area, agricultural operations, provided they do not propose structures or attract birds are normally acceptable in the approach surface and RPZ.
- Safety Review Area 2. This area is centered over the runway, overlays but excludes the territory in Safety Review Area 1, and extends outward and corresponds to the CNEL 65 dBA noise contour established for the ultimate expected level of aviation activities at the SCLA. This area consists primarily of industrial and commercial land use districts.
- Safety Review Area 3. This area is centered over the runways, extending outward in all directions with a 10,000 foot arc from the center of each end of the primary surface of each runway and connecting the adjacent arcs of lines tangent to those arcs and excludes the areas within Safety Areas 1 and 2. Land use districts within this area include residential, various types of commercial, and small pockets of industrial, institutional, and open space.

The compatibility of land uses depends on their location within the Safety Review Area. Table 3.2-4 lists land use compatibility for the three Safety Review Areas and Figure 3-14 depicts the three areas.

Table 3.2-4 Land Use Compatibility-Airport Safety Review Areas

Land Use Category	Safety Review Area 1	Safety Review Area 2	Safety Review Area 3
Residential: Single Family, Duplex, Mobile Home	CLU	CA[1]	NA[3]
Residential: Multi-family	CLU	NU	NA[3]
Transient Lodging: Motels and Hotels	CLU	NU[4]	NA[2]
Schools, Libraries, Churches, Hospitals, and Nursing Homes	CLU	NU[2]	CA[2]
Auditoriums, Concert Halls, and Amphitheaters	CLU	CLU	NA[2]
Sports Arenas and Outdoor Spectator Sports	CLU	CLU	NA[2]
Playgrounds and Neighborhood Parks	CLU	CA[2,4]	NA[2]
Golf Courses, Riding Stables, Water Recreation, and Cemetery	CLU	CA[2,4]	CLA
Office Buildings, Business Commercial, and Professional	CLU	CA[2,4]	NA[2]
Manufacturing, Transportation Services, and Contract Construction	CLU	CA[2,4]	NA[2]
Wholesale/Warehouse Operations and Salvage Operations	CLU	CA[2,4]	NA[2]
Utilities	CLU	NU	NA[2]
Agriculture	NA[2]	NA[2]	CLA
Livestock and Animal Breeding	CLU	NA[2]	NA[2]
Retail Trade/Commercial Services	CLU	CA[2,4]	NA[2]
Density Criteria			
Maximum Gross Density (dwelling units/acre)	0	0.5	6
Maximum Assembly (persons per acre)	10	100	No Limit[5]

Clearly Unacceptable (CLU): New construction/development should not occur. Existing uses should be relocated.

Normally Unacceptable (NU): New construction/development should not occur.

Conditionally Acceptable (CA): New construction/development may be permitted. Community character and/or unique development patterns may justify approval. Uses subject to restrictions and mitigation for purposes of public safety.

Normally Acceptable (NA): New construction/development permitted. Uses subject to restrictions and mitigation for purposes of public safety.

Clearly Acceptable (CLA): New construction/development permitted. No public safety restrictions envisioned.

1— Residential development underneath VFR traffic patterns, including approach surfaces, shall be discouraged. If development occurs, maximum density shall be one dwelling unit per 2 acres, and noise attenuation at or below 45 dB shall be required within habitable structures.

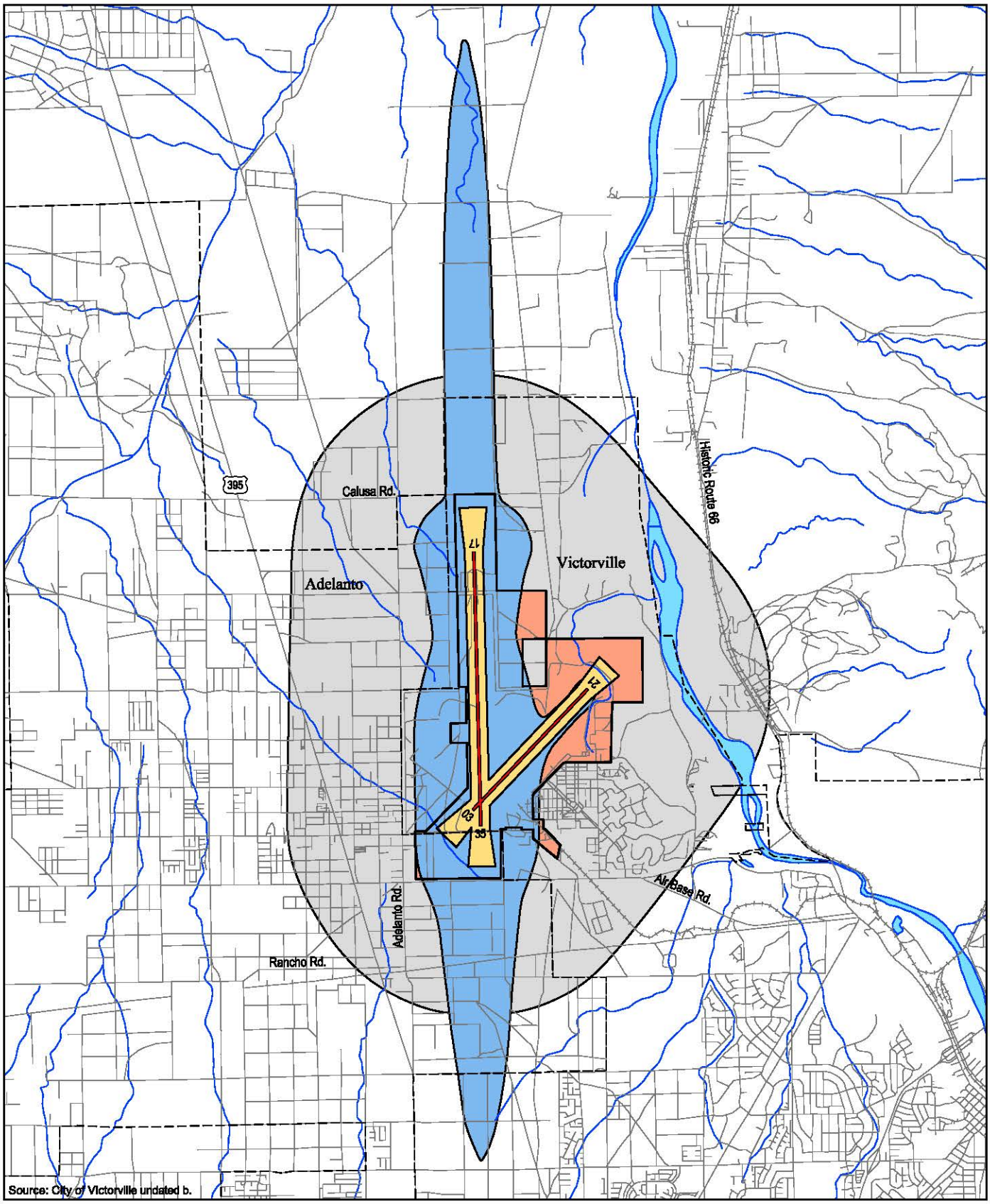
2— Land uses are considered acceptable provided no structures are proposed/developed or if structures are in locations outside approach surfaces, and are conditionally acceptable if located within transitional surfaces. The development of schools, libraries, churches, hospitals, and nursing homes below the transitional surfaces is normally unacceptable.

3— Residential development outside approach surfaces shall not exceed six dwelling units per acre; residential development within approach surfaces shall not exceed one dwelling unit per 2 acres.

4— Land uses satisfying density criteria may be acceptable.

5— Non-residential land uses within approach surfaces shall not exceed 100 persons per acre.

Source: City of Victorville undated b.



Southern California Logistics Airport

LEGEND

- Safety Review Area 1
- Safety Review Area 2
- Safety Review Area 3
- Southern California Logistics Airport
- Runway
- Roadway
- City Limits

N

0 7,500 Feet

Safety Review Areas, Southern California Logistics Airport

Figure 3-14

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Unified Facilities Criteria 3-260-01, *Airfield and Heliport Planning and Design*, establishes CZs at the ends of the runways for military airports. However, FAA guidance does not establish clear zones at civil airports. Instead, FAA Advisory Circular 150/5300-13, *Airport Design*, establishes RPZs at civil airports. An RPZ is comparable to a CZ and is established to enhance the protection of people and property. The dimensions for an RPZ for a precision instrument approach runway from which large aircraft operate are: 2,500 feet long and 1,000 feet wide at the inner end, which is 200 feet from the runway end; and 1,750 feet wide at the outer end. The total area of the RPZ is 78.914 acres.

The DoD AICUZ program establishes the guidance for land use planning around Air Force installations. Land use incompatibility under the AICUZ program considers two factors: noise and safety. The FAA's FAR Part 150, *Airport Noise Compatibility Planning*, is a land use compatibility planning program comparable to the DoD AICUZ program. Part 150 contains guidance for the FAA program and identifies land use compatibility based only on noise. FAA Advisory Circular 150/5300-13 contains the guidance for safety in land use planning. Additionally, FAR Part 77, Subpart C, establishes airspace imaginary surfaces that control obstructions to air navigation, thereby influencing safety at and around civil airports.

Part 150 provides a means for civilian airports to reduce the number of people affected by noise, consistent with airport operations. The FAR Part 150 process provides airport operators with the procedures, standards, and methods governing the development, submission, and review of airport Noise Exposure Maps (typically referred to as noise contours) and airport Noise Compatibility Programs.

The FAR Part 150 process is voluntary, and the SCLA has not prepared a FAR Part 150 study. The SCLA, however, has prepared an airport master plan in accordance with FAA guidance. The master plan establishes RPZs at the ends of the runways. The airport master plan is the planner's concept of the long-term development of an airport. Master plans are prepared to support modernization of existing airports and creation of new airports. The goal of a master plan is to provide guidelines for future airport development that will satisfy aviation demand, while at the same time resolve the aviation, environmental, and socioeconomic issues existing in the community. The airport operator is encouraged to accomplish a noise compatibility planning program and noise exposure maps as part of the master planning process. Noise compatibility planning for an airport master plan is carried out following the guidelines in FAR Part 150.

3.2.4 Air Quality

3.2.4.1 Air Pollutants and Regulations

The air pollutants and regulations information in Subchapter 3.1.4.1 also apply to the SCLA.

3.2.4.2 Regional Air Quality

The information on the method by which the USEPA tracks compliance with the NAAQS and the description of attainment, nonattainment, and unclassifiable for Travis AFB in Subchapter 3.1.4.2 also applies to the SCLA.

The SCLA is located in the Southeast Desert Air Basin, which includes the County of Imperial, portions of Kern, Los Angeles, Riverside, and San Bernardino Counties; and consists of the combination of the Mojave Desert Air Basin and the Salton Sea Air Basin. These air basins are under the jurisdiction of the following Air Pollution Control Districts (APCD) and Air Quality Management Districts (AQMD): Antelope Valley APCD; Kern County APCD; Mojave Desert AQMD; Imperial County APCD; and South Coast AQMD. This area is known as AQCR 33. According to federal regulations (40 CFR 81.305), AQCR 33 is designated as marginal nonattainment for 8-hour O_3; unclassifiable/attainment for $PM_{2.5}$ and CO; unclassifiable for PM_{10}; and cannot be classified/better than national standards for NO_2. Imperial County in AQCR 33 was designated as better than national standards for SO_2, while the rest of the counties in AQCR 33 were designated as cannot be classified for SO_2 and cannot be classified for Pb.

3.2.4.3 Baseline Air Emissions

The explanation of an air emissions inventory for Travis AFB in Subchapter 3.1.4.3 also applies to the SCLA. Table 3.2-5 lists the baseline air emissions inventory for AQCR 33, and Table 3.2-6 presents the emissions from the baseline aircraft operations at the SCLA.

Table 3.2-5 Baseline Air Emissions Inventory, Air Quality Control Region 33

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
AQCR CY 05 Total	219,146	45,954	84,680	4,709	175,711	53,619

Note: VOC is not a criteria air pollutant. However, VOC is reported because, as an ozone precursor, it is a controlled pollutant. $PM_{2.5}$ included for information only. Data reflected as tons per year.

Source: CARB 2007b.

Table 3.2-6 Emissions from Baseline Aircraft Operations, Southern California Logistics Airport

Activity	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Airfield Operations	134	104	76	6	18	18

Note: Emissions based on aircraft operations in Table 2.2-2.

3.2.5 Biological Resources

3.2.5.1 Vegetation and Wildlife

The vegetation community types surrounding the SCLA can best be described as belonging to remnant chaparral and creosote mixed shrub communities. Chaparral is California's most extensive, native plant community. It is also the state's most characteristic wilderness, dominating foothills and mountain slopes from the Rouge River Valley in southern Oregon to the San Pedro Martir in Baja California. Chaparral is a semi-arid or arid, shrub dominated association of woody plants shaped by summer drought, mild, wet winters, and naturally recurring fires every 30 to 150 years plus. Representative plants of the chaparral in this area of San Bernardino County include: Ceanothus (*Ceanothus* spp.), Chamise (*Adenostoma fasciculatum*), Redshanks (*Adenostoma sparsifolium*), Chaparral Pea (*Pickeringia montana*), Scrub oak (*Quercus berberidifolia*, *Q. dumosa*, *Q. wislizenii* var. *frutescens*), California Coffeeberry (*Rhamnus californica*), Islay or Hollyleaf Cherry (*Prunus ilicifolia*), Silk-tassel bush (*Garrya* spp.), Laurel sumac (*Malosma laurina*), Manzanita (*Arctostaphylos* spp.), Mountain mahogany (*Cercocarpus* spp.), Toyon (*Heteromeles arbutifolia*), and Yucca (*Hesperoyucca whipplei*). Creosote mixed shrub community is more open with expanses of exposed ground intermixed with various shrub species dominated by creosote (*Larrea tridentata*).

The remnant chaparral and creosote shrub community types are not well-represented within the project area at SCLA due to past construction and airfield development activities.

3.2.5.2 Special Status Species and Designated Critical Habitats

Table 3.2-7 lists the special status species that may have associated habitats and potential occurrences associated with SCLA. Although no intensive surveys have been conducted at the SCLA for T&E species, the habitat distributions and species occurrences are based on literature reviews and California Natural Diversity Database queries.

Table 3.2-7 Special Status Species

Taxonomic Group	Common Name	Scientific Name	Listing Status		Habitat Present or Known Occurrence within Action Area	Critical Habitat on or Adjacent to Action Area[1]
			Federal	State		
Amphibians	California red-legged frog	*Rana aurora draytonii*	Threatened	Threatened	No	No
Reptiles	Desert tortoise	*Gopherus agassizii*	Threatened	Threatened	Habitat present, potential for the desert tortoise to occur within the LZ project area	No
Birds	Least Bell's vireo	*Vireo bellii pusillus*	Endangered	Endangered	No	No
	Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	Endangered	No	No
	Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	Candidate for Listing	Endangered	No	No
	Burrowing owl	*Athene cunicularia*	-	Species of Concern	Habitat present, no records of occurrence within the LZ; however, occurrences are noted towards the Mojave River wash to the east.	NA
Mammals	Mojave ground squirrel	*Spermophilus mohavensis*	-	Threatened	Habitat present, species unlikely present	NA

Note: 1 Critical Habitat designations only apply to federally listed species.

Most species listed in Table 3.2-7 are associated with a riparian corridor to the east of the SCLA which has more mesic conditions when compared to the upland SCLA site. The desert tortoise, however, is not associated with the riparian corridor, and has a known population approximately 3 miles to the northwest of SCLA. This population is believed to be the largest of four primary populations. The CDFG has indicated that there are records of desert tortoise occurrences within the SCLA boundary. However, the current distribution, if any, of this species within the SCLA is unknown. Although vegetated areas of the SCLA may support some habitat requirements for the desert tortoise, the essential element of friable soil for burrow and nest construction is primarily absent from the action area due to past land uses and impacts. Therefore, although there is potential for the species within the SCLA LZ, it is highly unlikely the desert tortoise utilizes the proposed SCLA LZ site for foraging, breeding, or nesting.

The state-listed (threatened) Mojave ground squirrel is also not confined to riparian areas and requires friable soil for burrow construction. The species is closely associated with sandy and alluvial soil, and somewhat closely with rocky soil. Areas with these characteristics have been subject to intensive development and construction (soil compaction) at the proposed SCLA LZ site. Therefore, it is unlikely the Mojave ground squirrel is present or utilizes areas at the proposed SCLA LZ site.

The burrowing owl (state species of concern) is known to occur within the SCLA boundary on the eastern portion of the property (CNDDB 2007). Suitable habitat conditions exist for the burrowing owl within the proposed SCLA LZ site; however, there are no records of occurrence within the area subject to construction activities.

3.2.6 Cultural Resources

Other than installation and/or state-specific information, the regulatory and ROI discussion in Subchapter 3.1.6 also applies to the SCLA. The ROI for analysis of cultural resources includes all areas subject to alteration and/or disturbance to construct the LZ at the SCLA as defined in Subchapter 2.2.3. The ROI for the SCLA Alternative is composed solely of the built environment (*i.e.*, the airfield). One hundred percent of the ROI on the SCLA is previously disturbed by some form of construction activity.

Identification of cultural resources potentially impacted by the SCLA Alternative was accomplished by reviewing the 1992 George AFB EIS for base closure (USAF 1992) and the 2004 SCLA Specific Plan (City of Victorville Planning Department 2004). Numerous cultural resource surveys were conducted on George AFB and in its immediate vicinity. The most recent surveys were conducted in November 1990 in support of base closure at George AFB (Science Applications International Corporation [SAIC] 1990) and in June 2003 for the Program Environmental Impact Report for the most Specific Plan Amendment for the SCLA. The survey area encompassed approximately 3,500 acres in the original survey and an additional 3,500 acres in the 2003 study, and covered all areas not subject to present development or major disturbance. In addition, an architectural survey of all World War II buildings and facilities was conducted in 1991 (SAIC and Hatheway Associates 1991). Three of these cultural resources investigations were conducted within or adjacent to the ROI at the SCLA, as identified on Table 3.2-8.

Table 3.2-8 Previous Cultural Resources Investigations within or Adjacent to the SCLA Region of Influence

Year	Study
1990	Archaeological Survey and Inventory of George AFB, California.
1991	George AFB World War II Buildings and Facilities
2003	Archaeological Survey of SCLA

Source: USAF 1992; City of Victorville Planning Department 2004

3.2.6.1 Archaeological Resources

During the 1990 survey, three archaeological sites (one prehistoric, one historic, and one of unknown temporal affiliation) and 13 isolated finds were recorded (see Table 3.2-9). No archaeological sites eligible for the NRHP were identified during the 1990 survey. The California SHPO concurred with these findings in a letter dated May 28, 1991.

Table 3.2-9 Archaeological Sites on the SCLA

Description	Occupation Date	Status
Lithic scatter	Prehistoric	Not NRHP Eligible
Rock Cairn	Unknown	Not NRHP Eligible
Trash Dump	Historic (1930s)	Not NRHP Eligible

Source: USAF 1992

During the 2003 survey, 32 additional archaeological sites (of which 28 were historic building locations) and several isolated finds were recorded (City of Victorville Planning Department 2004). These sites were not recommended as eligible for the NRHP because they contained limited research potential and were ubiquitous for those type of archaeological sites in the Mojave River basin.

The potential for buried archeological deposits is high along the floodplain and first terrace of the Mojave River. Known NRHP-eligible resources are located just outside the former boundary of George AFB.

3.2.6.2 Historical Resources

The SCLA was formerly known as Victorville Army Airfield, a flight training school (Global Security 2007a) and then as George AFB. Initial construction of the base began July 1941 and was completed May 1943. From 1945 to 1950, the base was placed on standby status and was used as storage for surplus aircraft. In September 1950, the base was renamed George Air Force Base in honor of the late Brigadier General Harold H. George. Flight training was the primary mission at George AFB and included bombers, gliders, single engine, twin engine, and jet fighter aircraft (Global Security 2007a). George AFB was a major training facility for the F-4 Phantom fighter aircraft. On January 5, 1989, the Secretary of Defense announced the closure of George Air Force Base, pursuant to the Base Closure and Realignment Act (PL 100-526). The base was officially deactivated by the Department of the Air Force on December 15, 1992.

No evidence of pre-military historic sites or structures was identified on George AFB. The base, however, was established during World War II and reflects the historical development of that era, specifically as it relates to the training of military flight crews. World War II buildings were evaluated to determine whether their eligibility for inclusion on the NRHP (SAIC and Hatheway Associates 1991). Four historic structures were recommended as potentially NRHP eligible following the initial evaluation of George AFB facilities. Upon further investigation, however, the Air Force determined that these properties were not eligible for the NRHP. The SHPO concurred with this determination in their letter dated August 7, 1991. During the 2003 survey, an additional historical resource, a 1930-era highway bridge, was recorded (City of Victorville Planning Department 2004).

3.2.6.3 Native American Interests

Early and effective participation of Native American tribes and groups is an integral component to the successful completion of the Section 106 process. Eight Native

American groups that could be affected by the SCLA Alternative were identified by the California Native American Heritage Commission (Table 3.2-10). As lead federal agency, the Air Force initiated consultation with eight Native American groups, pursuant to 36 CFR 800.2, and to ensure that any sites of traditional cultural value are identified and adequately considered under the alternative action. The Air Force sent correspondence to the tribes announcing the action and requesting concerns regarding the SCLA Alternative (see Appendix E).

Table 3.2-10 Native American Groups Identified for the SCLA

State	Tribal Name
Arizona	AhaMaKav Cultural Society, Fort Mojave Indian Tribe
California	Chemehuevi Reservation
	Morongo Band of Mission Indians
	San Fernando Band of Mission Indians
	San Manuel Band of Mission Indians
	Serrano Band of Indians
	Tehachapi Indian Tribe
	Tubatulabal/Kawaiisu/Koso/Yokuts (Ron Wermuth)

3.3 GRANT COUNTY AIRPORT

3.3.1 Aircraft Operations and Safety and Bird/Wildlife-Aircraft Strike Hazard

3.3.1.1 Aircraft Operations

The background information in Subchapter 3.1.1.1 concerning airspace and flight pattern locations also applies to the Grant County Airport. The airspace around the airport and up to 10,000 feet above MSL is controlled by Grant County TRACON, which provides radar vectoring, sequencing, and separation service for VFR and IFR aircraft operating within the airspace as well as into and out of the airport.

There is one private and five public use airports within or adjacent to the controlled airspace associated with the Grant County Airport. Seven low-altitude federal airways pass through the airspace surrounding the airport. The Okanogan and Roosevelt military operations areas are located approximately 50 miles north of the Grant County Airport, and the Yakima Training Center restricted area is located 35 miles to the southwest.

The airfield consists of two primary instrument runways (14Left/32Right [14L/32R] and 04/22), and two shorter runways (14R/32L and 18/36). Additionally, Runway 09/27, which is 4,500 feet long and 90 feet wide, is used as an LZ for C-17 training. Runway 04/22 is oriented northeast/southwest and is 9,999 feet long and 100 feet wide. Runway 14L/32R is oriented northwest/southeast and measures 13,502 feet long and 200 feet wide. The two shorter runways are located to the west of the primary runways. Runway 14R/32L measures 3,025 feet long and 75 feet wide. Runway 18/36 is 3,263 feet long and 75 feet wide. Airport elevation is 1,185 feet MSL. The Grant County Airport air traffic control tower operates between 6:00 a.m. and 10:00 p.m. daily. Fourteen instrument approach procedures are available for arrivals to the Grant County

Airport. Aircraft traffic pattern altitudes are 1,000 feet AGL for rectangular patterns and 1,500 feet AGL for overhead patterns.

McChord AFB and the Grant County Airport have an agreement that allows Air Force tactical air traffic control personnel access to the airfield and airfield lighting when the tower is closed (*i.e.*, 10:00 p.m. to 7:00 a.m.). In accordance with FAA guidance, C-17 operations at the Grant County Airport during this period are accomplished as an uncontrolled airfield (Ryan 2007). When operating at an uncontrolled airfield, pilots of arriving and departing aircraft, and aircraft accomplishing closed patterns, are requested to advise other pilots who may be operating at the airport or within the airspace around the airport of their intentions via radio calls on a common frequency assigned to the airport. Under the agreement, McChord AFB limits the number of C-17 aircraft in the patterns at the Grant County Airport to a maximum of two aircraft when the air traffic control tower is closed. Additionally, under the agreement, C-17 aircraft will not operate between 2:00 a.m. and 7:00 a.m. at the Grant County Airport (Ryan 2007).

Aircraft operations at the Grant County Airport are a mix of military, civil, air taxi, and general aviation activities. C-17 operations are accomplished on Runways 14L/32R, 04/22, and the LZ (Runway 09/27). Baseline C-17 operations on the LZ include tactical maneuvers such as spiral up departures, spiral down arrivals, high-speed-low altitude arrivals and departures, steep straight-in arrivals, and steeper than normal climb out on departure. Table 2.2-3 summarizes aircraft operations at the Grant County Airport. C-17s accomplish about 68 operations per day.

Based on information in AC 50/5060-5 (see Subchapter 3.2.1.1), the Grant County Airport is estimated to have an annual service volume of 355,000 operations and an IFR hourly capacity of approximately 59 airfield operations. Assuming nearly all operations occur primarily between 6:00 a.m. and 2:00 a.m., there would be 20 hours of operations per day for hourly capacity purposes. The baseline annual 79,716 operations equate to about 22 percent of the annual airfield capacity. Based on a 20-hour day, the average hourly operations would be about 11 operations, or 19 percent of the hourly capacity.

3.3.1.2 Aircraft Safety

The aircraft safety information for civil aircraft in Subchapter 3.2.1.2 and C-17s in Subchapter 3.1.1.2 also apply to the Grant County Airport.

3.3.1.3 Bird/Wildlife-Aircraft Strike Hazard

The BASH information in Subchapter 3.1.1.3 also applies to the Grant County Airport.

3.3.2 Noise

Aviation-related activities at the Grant County Airport dominate the acoustic environment. The noise definition information in Subchapter 3.1.2 also applies to the Grant County Airport.

3.3.2.1 Noise Metrics and Analysis Methods

The single event and averaged noise metrics and noise analysis methods information for Travis AFB in Subchapter 3.1.2.1 also apply to the Grant County Airport.

3.3.2.2 Baseline Noise Analysis

Single Event Noise Analysis

Table 3.3-1 lists the SEL and L_{max} values for the aircraft that operate at the Grant County Airport at takeoff power and at varying slant range distances from the aircraft.

Table 3.3-1 Aircraft Noise Levels in Sound Exposure Level and Maximum Sound Level as a Function of Slant Range Distance from Aircraft, Grant County Airport

Aircraft	200 Feet	300 Feet	500 Feet	1,000 Feet	2,000 Feet
SEL					
B-747-200	116	113	109	103	96
B-767 CF	109	106	102	97	91
B-737-300	105	103	99	94	88
DC-9-30QN9	121	118	115	110	105
C-172	88	86	82	76	73
C-17	115	112	108	102	96
P-3	106	103	100	94	88
EA-6B	126	123	119	114	107
Lmax					
B-747-200	114	110	104	96	88
B-767 CF	107	104	99	91	83
B-737-300	102	98	93	86	79
DC-9-30QN9	119	116	111	104	97
C-172	85	81	77	70	63
C-17	113	109	104	96	88
P-3	104	100	95	88	80
EA-6B	126	122	117	110	101

Note: Values reflect dBA. Data not listed for B-777, C-208, and C-210 because the Flyover Noise Calculator (USAF 2002) does not contain data for the aircraft. The T-41 was used to determine the noise values for the C-172 because the Flyover Noise Calculator does not contain data for the C-172. The T-41 is the military version of the C-172.

Averaged Noise Analysis

The primary source of noise in the vicinity of the Grant County Airport is airfield operations. Baseline noise conditions are based on the average daily airfield operations shown on Table 2.2-3 (No Action Alternative). About 218 average daily airfield operations occur at the Grant County Airport under the baseline condition. The operations in Table 2.2-3 represent the 2006 condition at the Grant County Airport.

Figure 3-15 shows the baseline condition aircraft ground tracks, and Figure 3-16 depicts the noise exposure area for the baseline.

Table 3.3-2 lists the number of acres (land area off-airport), the number of people within the DNL 65 dBA and greater noise exposure area, and the estimated number of people who might be potentially highly annoyed by noise at those levels. People would be exposed to aircraft noise in three of the four noise zones (see Table 3.3-2), with the DNL 65-70 dBA noise zone containing 1,969 of the 2,085 persons exposed to DNL 65-dBA and greater. These 2,085 persons would equate to 17 percent of the estimated 12,373 persons (based on 2000 census data) who live within the approximate 5-mile radius area associated with airfield airspace environment.

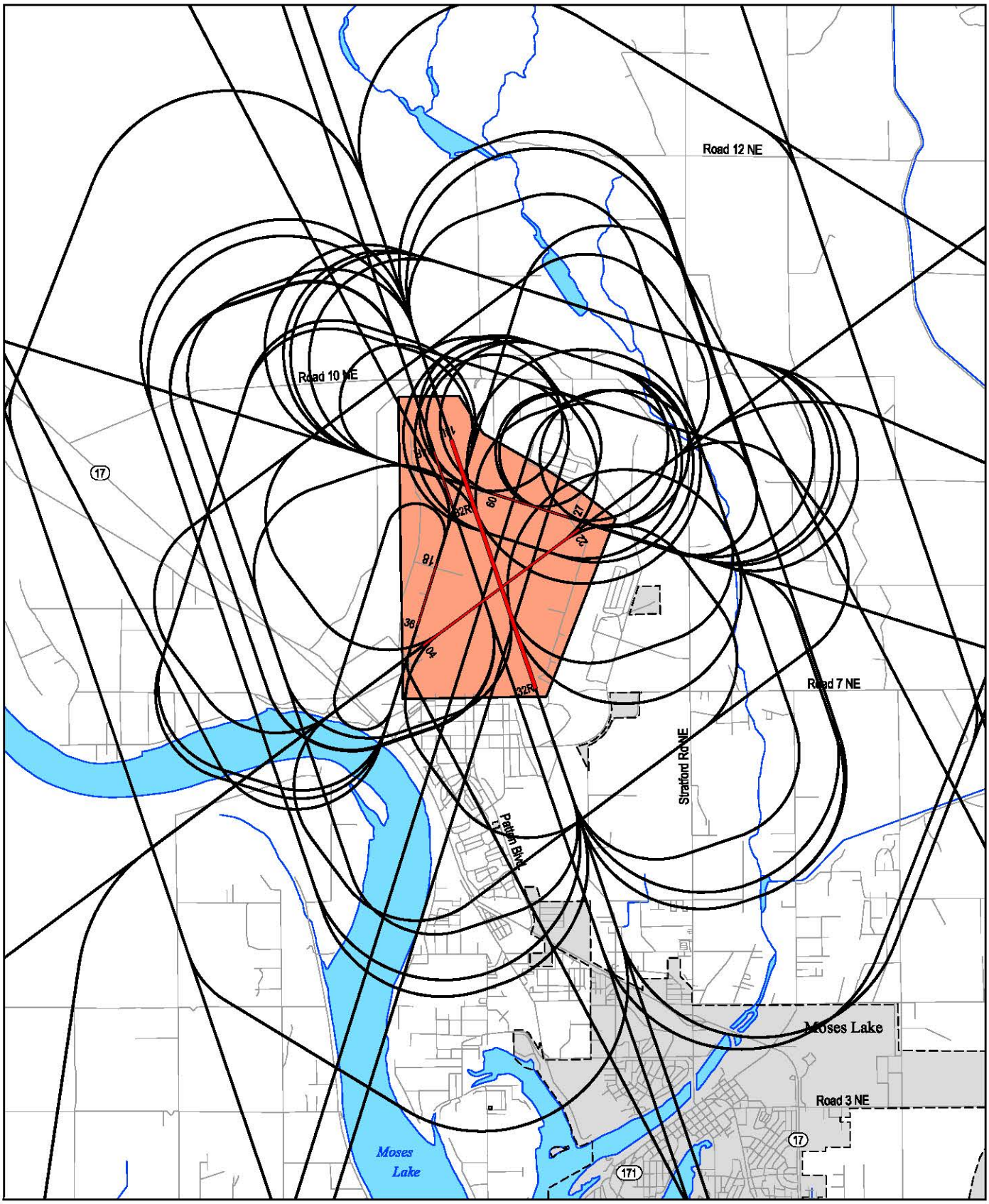
Table 3.3-2 Baseline Noise Exposure, Grant County Airport

	DNL Interval (dBA)				
Category	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres	4,446	1,354	427	35	6,262
People	1,969	114	2	0	2,085
People Potentially Highly Annoyed	433	42	1	0	476

Note: Acres reflect only off-Base land area. Population data used to determine the number of people within a noise zone were obtained from the United States Census Bureau 2000 census. It was assumed that population was equally distributed within a census tract area to estimate affected population. Using the noise contour information, the number of acres of land in each noise zone (e.g., DNL 65-70 dBA, 70-75 dBA, 75-80 dBA, and 80 dBA and greater) were divided by the number of acres of land in each census block to determine the portion of the census tract within each noise zone. The population total in each block-group was then multiplied by this ratio to estimate affected population within each zone. This process was used throughout the EA. People highly annoyed were determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1-4

Effect of Aircraft Noise on Structures

The discussion of the effects of noise on structures for Travis AFB in Subchapter 3.1.2.2 also applies to the Grant County Airport. Table 3.3-1 presents the L_{max} for the aircraft operating at the Grant County Airport. C-17 aircraft, which currently operate at the airport and which are also associated with the proposed action at the Grant County Airport, produce a maximum sound level of 113 dBA when the aircraft is directly overhead at 200 feet AGL on takeoff. The aircraft producing the greatest maximum sound level is the EA-6B, which produces 126 dBA at 200 feet AGL. These sound levels would be below the level at which damage to structures would be anticipated (*i.e.*, 127 dBA).



Grant County Airport

LEGEND

- Ground Track
- Runway
- Roadway
- City Limits
- Grant County International Airport

N

0 7,000

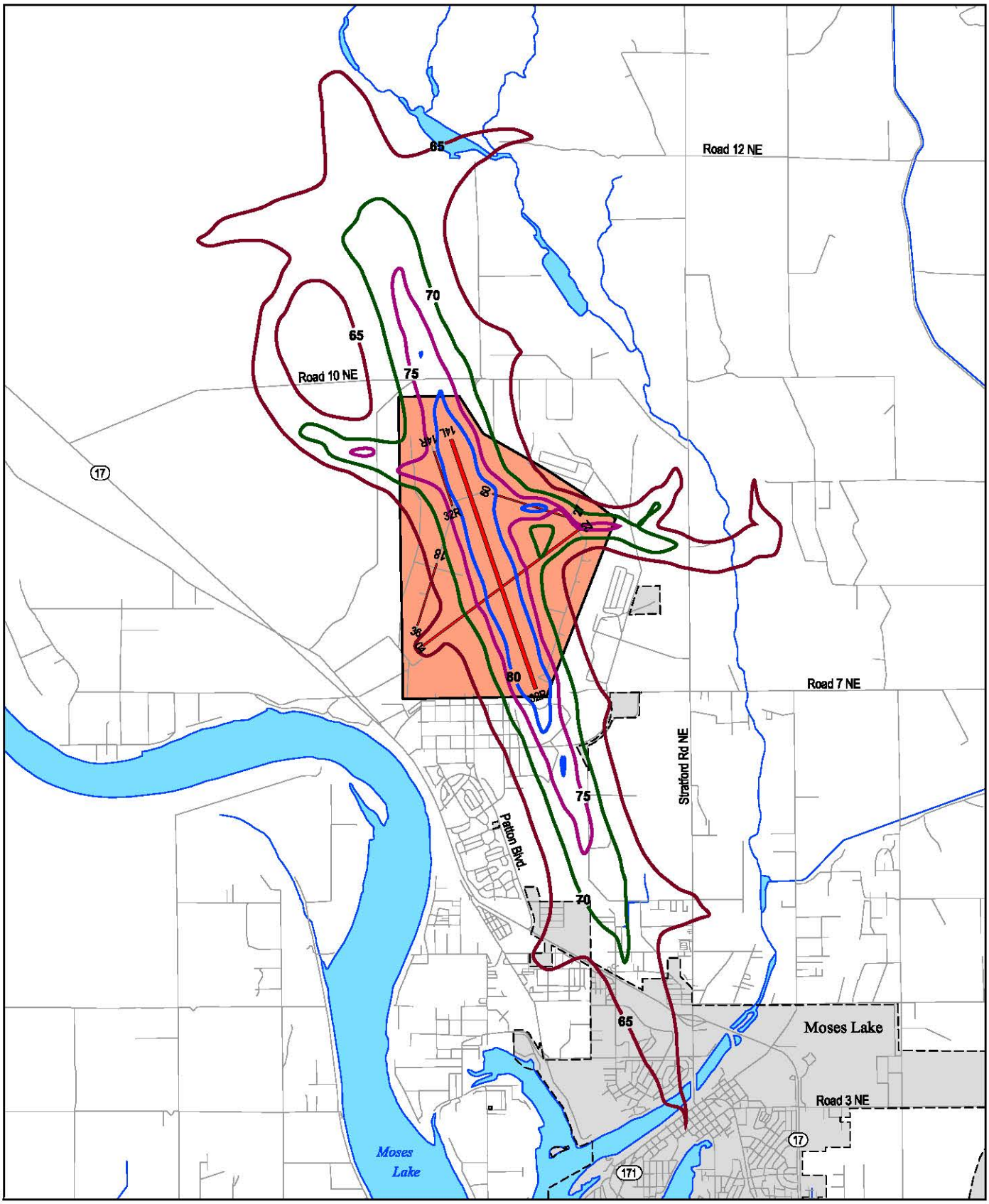
Feet

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Baseline Aircraft Ground Tracks, Grant County Airport

Figure 3-15

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Grant County Airport

LEGEND

- DNL 65 dBA Contour
- DNL 70 dBA Contour
- DNL 75 dBA Contour
- DNL 80 dBA Contour
- Runway
- Roadway
- City Limits
- Grant County International Airport

N

0 7,000

Feet

Baseline Noise Contours, Grant County Airport

Figure 3-16

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3.3.3 Land Use

The Grant County Comprehensive Plan (1977) includes the Grant County Airport and the land surrounding it. Objectives of the Plan include preserving agricultural land, avoiding leapfrog development, preserving open space for recreational purposes, and locating industries on non-agricultural land a suitable distance from communities so as not to adversely affect existing residential development. The Comprehensive Plan of the City of Moses Lake (1981) addresses the area within the City's corporate limits and the fringe urban area, to include the Grant County Airport (Grant County International Airport 2005).

The Grant County Airport is located northwest of Moses Lake in Grant County, Washington. The largest on-airport land use is air operations, and the second largest is open/agricultural. The on-airport aviation support land use area includes the terminal and fire fighting training area. Industrial land use is included in the aviation support land use category (Grant County International Airport 2005).

The major off-airport land use in the area around the airport is open/agricultural. Undeveloped areas occur on all sides of the airport. The lake is southwest of the airport, and ranchland occurs to the west and north. There are several houses north of the airport, but the density is less than 5 acres per house, and the land is classified as open/agricultural. Land southeast of the airport is cultivated farmland. The area south of the airport toward the City of Moses Lake is the most developed. However, there are many large open areas and vacant lots between the airport and the City of Moses Lake.

The FAR Part 150 process is voluntary, and the Grant County Airport has not prepared a FAR Part 150 study. The Airport, however, has prepared an airport master plan in accordance with FAA guidance (Grant County International Airport 2005). Subchapter 3.2.3 contains additional information on airport master plans.

3.3.4 Air Quality

3.3.4.1 Air Pollutants and Regulations

The air pollutants and regulations information in Subchapter 3.1.4.1 also apply to the Grant County Airport.

3.3.4.2 Regional Air Quality

The information on the method by which the USEPA tracks compliance with the NAAQS and the description of attainment, nonattainment, and unclassifiable for Travis AFB in Subchapter 3.1.4.2 also applies to the Grant County Airport.

Grant County Airport is located in Grant County within the Eastern Washington-Northern Idaho Interstate AQCR 62. The AQCR includes the Idaho Counties of Benewah, Kootenai, Latah, Nez Perce, and Shoshone, and the Washington Counties of

Adams, Asotin, Columbia, Garfield, Grant, Lincoln, Spokane, and Whitman. Grant County is within the jurisdiction of the Department of Ecology Eastern Region APCD. Boundaries of the Eastern Region APCD include the Washington Counties of Adams, Asotin, Columbia, Ferry, Garfield, Grant, Lincoln, Pend Oreille, Stevens, Walla Walla, and Whitman. The USEPA designated the air quality within AQCR 62 as of July 2006 as better than national standards for SO_2; unclassified/attainment for CO, 8-hour O_3, and $PM_{2.5}$; nonattainment for PM_{10} (due to Shoshone County in Idaho about 175 miles east of the Grant County Airport); and cannot be classified/better than national standards for NO_2.

3.3.4.3 Baseline Air Emissions

The explanation of an air emissions inventory for Travis AFB in Subchapter 3.1.4.3 also applies to the Grant County Airport. Table 3.3-3 lists the baseline air emissions inventory for AQCR 62 and Table 3.3-4 presents the emissions from the baseline aircraft operations at the Grant County Airport.

Table 3.3-3 Baseline Air Emissions Inventory, Air Quality Control Region 62

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
AQCR 2001 Total	394,296	69,253	56,620	9,077	134,609	38,987

Note: VOCs are not an air pollutant criterion. However, VOCs are reported because, as an O_3 precursor, it is a controlled pollutant. Data reflected as tpy.
Source: AirData 2007.

Table 3.3-4 Emissions from Baseline Aircraft Operations, Grant County Airport

Activity	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Airfield Operations	543	213	652	36	125	124

Note: Emissions based on aircraft operations listed in Table 2.2-3.

3.3.5 Cultural Resources

Other than installation and/or state-specific information, the regulatory and ROI discussion in Subchapter 3.1.6 also applies to the Grant County Airport. The ROI for the analysis of cultural resources includes all areas subject to alteration and/or disturbance to support of the LZ at the Grant County Airport as defined in Subchapter 2.2.2. The ROI for the Proposed Action at the Grant County Airport is composed solely of the built environment (*i.e.*, airfield). One hundred percent of the ROI on the Grant County Airport was disturbed previously by some form of construction activity.

Identification of cultural resources potentially impacted by the proposed action was accomplished by reviewing the 2005 Grant County International Airport Master Plan Update (URS Corporation 2005) and the NRIS (National Park Service [NPS] 2007b).

Additional information was gathered from the internet on Moses Lake Army Air Base and Larson AFB, previous incarnations of the Grant County Airport.

3.3.5.1 Archaeological Resources

Based on site files searches conducted at the Washington State Office of Archeological and Historic Preservation for the Master Plan Update (URS Corporation 2005), no cultural resources have been identified at the Grant County Airport; however, no archaeological surveys were ever conducted. Three archaeological sites are listed on the NRHP for Grant County, although none are located near Moses Lake (NPS 2007b). The Grant County Airport project area was previously disturbed during original construction of the flightline in 1942.

3.3.5.2 Historical Resources

Five buildings or structures are listed on the NRHP for Grant County, although none are located near Moses Lake (NPS 2007a). Originally, the Grant County Airport was established in 1942 as Moses Lake Army Air Depot, a temporary training center, and used to train P-38 pilots and B-17 Flying Fortresses combat crews (Global Security 2007b). In 1945, the facility was placed on standby status but was used for the following three years as a test site for two of Boeing's aircraft, the B-47 Stratojet and the B-50 (USAF 1961). The facility reopened in 1948 under the ADC and in 1950 was re-designated Larson AFB in honor of Major Donald A. Larson, a World War II ace from Yakima, Washington, killed in action over Germany in 1944. Larson AFB was placed under the Tactical Air Command in 1952. The Air Materiel Command Flight Test Center at Larson AFB tested B-52s from 1955 through 1959 (URS Corporation 2005). During this time, Boeing built a $5.8 million hangar to accommodate eight B-52s or KC-135 tankers (Global Security 2007b); the hangar was 1,068 feet long and 372 feet wide built by Seattle engineering firm Worthington & Skilling (Global Security 2007a) (Building 5820). The Strategic Air Command assumed command of Larson AFB in 1960 and included B-52D, KC-135, and Titan I intercontinental ballistic missile missions (URS Corporation 2005). Larson AFB was declared surplus in 1964 and closed in 1966.

Family housing was sold to the Grant County Housing Authority and the other non-operational buildings (dormitories, commercial, and recreational facilities) and three hangars were transferred to the Big Bend Community College. The flightline and industrial facilities were transferred to the Port of Lake Moses in 1966 (URS Corporation 2005).

Historic buildings at the Grant County Airport consist of twenty-nine World War II-era structures and Cold War buildings (Table 3.3-5) including hangars, warehouse, shops, administrative buildings, and the airport terminal. Most of these historic buildings are considered in poor to fair condition (URS Corporation 2005), unless renovated in the last 15 years. It is unlikely that any of these buildings would be considered NRHP-eligible due to their lack of physical integrity and the loss of historic context with the original layout of the first Moses Lake Army Air Depot, and later as Larson AFB.

Table 3.3-5 Larson AFB Era Historic Resources at Grant County Airport

Bldg.	Original Function	Year Built	Renovated
401	Hangar	1952	
408	Hangar	1942-1964	
425	Unknown	1942-1964	
429	Administrative	1942-1964	
431	Storage	1942-1964	
1202	Terminal	1942-1964	Yes
2101	Maintenance	1942-1964	Yes, 1992
2102	Unknown	1942-1964	Yes
2106	Hangar	1942-1964	
2107	Hangar	1942-1964	
2111	Hangar	1942-1964	
2113	Administrative	1942-1964	
2114	Shop	1942-1964	Yes
2203	Hangar	1942-1964	
2322	Shop	1942-1964	Yes
2521	Administrative	1942-1964	
2601	Storage	1942-1964	
2702	Shop	1942-1964	
2703	Warehouse/Shop	1942-1964	Yes
2805	Maintenance	1942-1964	Yes
2901	Warehouse/Shop	1942-1964	Yes
2903	Warehouse/Shop	1942-1964	Yes
3101	Warehouse/Shop	1942-1964	
3401	Hangar	1942-1964	Yes
4006	Hangar	1942-1964	
5103	Unknown	1942-1964	
5104	Storage	1942-1964	
5820	Hangar	1942-1964	
5825	Hangar	1942	Yes

Source: URS Corporation 2005: Appendix G

3.3.5.3 Native American Interests

Early and effective participation of Native American tribes and groups is an integral component to the successful completion of the Section 106 process. Three federally recognized Native American groups that could be affected by the proposed action are identified (Table 3.3-6). As lead federal agency, the Air Force initiated consultation with three federally recognized Native American tribes, pursuant to 36 CFR 800.2, and to ensure that any sites of traditional cultural value are identified and adequately considered under the proposed action. The Air Force sent correspondence to the tribes announcing the action and requesting concerns regarding the proposed action (see Appendix E).

Table 3.3-6 Native American Groups Identified for Grant County Airport

State	Tribal Name
Washington	Colville Confederated Tribes
	Spokane Nation
	Yakama Tribal Council

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CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

This chapter provides analysis of the environmental of the No Action Alternative, Proposed Action, and the SCLA Alternative. The primary basis for the analysis is the amount of change in aircraft operations at the permanent LZ locations.

4.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, HQ AMC would not construct a permanent LZ in the western United States. Airfield operations at Travis AFB, the SCLA, and the Grant County Airport would continue at the baseline levels (see Tables 2.2-1, 2.2-2, and 2.2-3, respectively). The significance criteria listed for the resources in this subchapter also apply throughout the EA.

4.1.1 Travis AFB

Aircraft Operations, Aircraft Safety, and Bird/Wildlife-Aircraft Strike Hazard

Aircraft operations impacts would be considered significant if: (1) the airspace or airfield does not have the capacity to accommodate the changes with the action; or (2) the changes associated with the action would conflict with the baseline operations condition. An aircraft safety impact would be significant if there would be change in the number or type of aircraft operations that could potentially change the aircraft mishap rate. A bird/wildlife-aircraft strike would be significant if it would likely result in an aircraft accident, involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

The types of aircraft operating at the Base, as well as airspace and runway use, would remain the same as the baseline. The air traffic control procedures, which accommodate the current level of activity, would continue to be used to control aircraft operations. The potential for aircraft accidents or bird/wildlife-aircraft strikes would remain at the baseline conditions. The risk would continue to be low that an aircraft involved in an accident at or around the Travis AFB would strike a person or structure on the ground. Likewise, it would continue to be unlikely that any of the BASH incidents would involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

Noise

Several items were examined in evaluating potential noise impacts, including the degree to which noise levels generated by construction and airfield operation activities would: (1) exceed HUD, FAA, or Air Force standards; (2) cause structural damage; (3) annoy people; and (4) cause hearing loss.

Noise would continue to be generated by aircraft operations and construction and demolition activities associated with individually programmed facility actions and operation and maintenance activities. The number of persons exposed to noise and potentially highly annoyed would remain at the current levels (see Table 3.2-3). The 375 persons exposed to CNEL 60 dBA and greater would continue to equate to 1 percent of the persons who live within a 5-mile radius of the airfield. Noise-induced hearing loss would not occur because individuals would not be exposed to noise for the duration at which loss could occur. No damage would occur to structures in the area surrounding the airport from C-17 operations because the noise produced by the aircraft would not exceed the level at which structural damage occurs.

Land Use

An impact to land use would be considered significant if one or more of the following occur as a result of the proposed action: (1) conflict with applicable ordinances and/or permit requirements; (2) nonconformance with applicable land use plans; (3) preclusion of adjacent or nearby properties being used for existing activities; or (4) conflict with established uses of an area.

Continuation of the current activities would be consistent with the land use categories in the General Plan. Any facilities actions at Travis AFB would be accomplished in accordance with the Base's General Plan. Continuation of the current activities would be consistent with the land use in the area surrounding the Base.

Air Quality

Impacts to air quality in attainment areas would be considered significant if pollutant emissions associated with implementation of the federal action caused or contributed to a violation of any national, state, or local ambient air quality standard, exposed sensitive receptors to substantially increased pollutant concentrations, represented an increase of 10 percent or more in the affected AQCR's emissions inventory, or exceeded any significance criteria established by the SIP. Impacts to air quality in nonattainment areas would be considered significant if the net change in proposed pollutant emissions caused or contributed to a violation of any national, state, or local ambient air quality standard; increased the frequency or severity of a violation of any ambient air quality standard; or delayed the attainment of any standard or other milestone contained in the SIP. With respect to the General Conformity Rule, impacts to air quality would be considered significant if emissions increased a nonattainment area's emissions inventory by 10 percent or more for individual nonattainment pollutants; or exceeded *de minimis* threshold levels established in 40 CFR 91.153 (b) for individual nonattainment pollutants or pollutants for which an area has been redesignated as a maintenance area.

Emissions would continue to be generated by Travis AFB activities such as aircraft operations and other aircraft maintenance activities, as well as vehicle, boiler, generator, and fueling operations, and industrial processes. It is anticipated that emissions from these activities would continue at the baseline condition rates, which do not exceed the SIP thresholds for the Base.

Biological Resources

An effect to biological resources would be considered significant if the action would adversely affect a threatened or endangered species by substantially diminishing habitat for a plant or animal species, substantially diminishing a regionally or locally important plant or animal species, interfering substantially with wildlife movement or reproductive behavior, and/or resulting in a substantial infusion of exotic plants or animal species.

The potential for adverse effects to biological resources on Travis AFB would be minimized through the continued use of existing natural resources management plans.

Cultural Resources

A project is considered to have an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the NRHP. An effect would be considered adverse when it diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties would include, but would not be limited to:

- physical destruction, damage, or alteration of all or part of the property;
- isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;
- introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- neglect of a property resulting in its deterioration or destruction; and
- transfer, lease, or sale of the property (36 CFR 800.9[b]).

Any ground-disturbing action in the area of an NRHP-eligible or potentially eligible archaeological site, or modification to such a site, can affect the integrity of that cultural resource, resulting in alteration or destruction of those characteristics or qualities that make it significant and potentially eligible for inclusion in the NRHP. While archaeological sites or historic buildings or structures can be destroyed during a single event, more often it is the cumulative effect of recurrent disturbing actions that diminish the integrity of the cultural resource and its significant characteristics.

No supersonic flight or supersonic events would occur as a result of the No Action Alternative. Activities with potential to adversely affect cultural resources would be potential aircraft crashes and noise.

PL 100-91, passed in August 1987, directed the U.S. Forest Service and the NPS to conduct studies and make recommendations to Congress on aircraft overflight that may be affecting either visitors or resources of the National Forest System and National Parks. Completed in July 1992, this cooperative study (USDA 1992) concluded the following:

- Because many cultural resources are located in remote and uninhabited areas, documented observations of aircraft noise effects are rare; and

- Most of the available literature relates to research by the Air Force, National Aeronautics and Space Administration, and the FAA and has focused on the effects of sonic booms.

A recently developed prediction method places a definite risk of damage to prehistoric structures (*e.g.*, rock art [petroglyphs and pictographs], rock alignments, rock cairns) from low overflight of heavy bombers and heavy helicopters; however, measurement programs were conducted that conclude there is minimal risk of damage to structures from light, low-flying subsonic jet aircraft and light helicopters.

Some evidence exists that long-term effects of noise exposure could result in damage by initiating or accelerating the deterioration process, especially to already fragile resources. Long-term effects appear as (1) fatigue effects in walls and other structural elements after extensive exposure, (2) moisture damage initiated by cosmetic cracks in exterior surfaces, and (3) gradual erosion of surface materials (*e.g.*, adobe mud-plastered walls) from repeated events.

A study that examined noise effects of low-level B-52 overflight on Long House, a 1,000-year old Arizona adobe, concluded that noise from a B-52 aircraft would have no significant effects. Noise levels generated by the B-52 aircraft during this study were as high as 113 dBA. Noise-induced landslides and rockfalls are less probable (less than 0.001 percent probability), so by inference, rock art, rock alignments, and cairns are unlikely to be disturbed. Based on these data, noise impacts to archaeological and historic resources are not expected as a result of low-level subsonic aircraft overflight. In addition, the maximum sound pressure generated by the C-17 (109-dBA at 300-feet AGL) would be less than the 113-dBA generated by B-52 aircraft in the study (USAF 1997).

Effects of aircraft accidents on cultural resources are unpredictable. There are two potential ways for aircraft accidents to affect cultural resources. These are: (1) aircraft crashing onto or into and damaging sites; and (2) personnel and vehicles in the process of retrieving falling objects driving over or otherwise damaging cultural resources. However, the occurrence of aircraft accidents is statistically low. There is only a small probability that potential historic properties might be affected by aircraft accidents.

For this analysis, the ROI is synonymous with the APE, as defined by the NHPA. The ROI is the geographic area within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.

There would be no LZ construction or operation activities; however, aircraft operations would continue at the baseline levels. The potential for impact on cultural resources would remain low due to routine airfield maintenance and aircraft operations activities. Cultural resources would continue to be managed in accordance with procedures outlined in the Travis AFB ICRMP.

Cumulative Impacts

Aircraft operations, aircraft safety, and BASH. None of the other actions include aircraft operations. Therefore, aircraft operations would remain at the baseline levels and there would be no cumulative impacts for aircraft operations, aircraft safety, and BASH when considering the No Action Alternative and the other actions.

Noise. None of the other actions include aircraft operations. Therefore, there would be no cumulative impacts for noise from aircraft operations when considering the No Action Alternative and the other actions. Aircraft noise would remain at levels identified for the baseline (see Figure 3-7). No construction would occur under the No Action Alternative. Thus, there would be no cumulative impacts for construction noise when considering the No Action Alternative and the other actions.

Land Use. The LZ would not be constructed and additional aircraft operations would not occur under the No Action Alternative. Thus, there would be no on- or off-Base land use cumulative impacts when considering the No Action Alternative and the other actions.

Air Quality. The LZ would not be constructed and aircraft operations would not occur on an LZ under the No Action Alternative. There would be no cumulative impacts because no construction emissions would be generated by the No Action Alternative. Emissions from aircraft operations would continue at baseline levels.

Biological Resources. The LZ would not be constructed under the No Action Alternative. Thus, there would be no cumulative impacts for biological resources when considering the No Action Alternative and the other actions.

Cultural Resources. The LZ would not be constructed under the No Action Alternative. Thus, there would be no cumulative impacts for cultural resources when considering the No Action Alternative and the other actions.

4.1.2 Southern California Logistics Airport

Aircraft Operations, Aircraft Safety, and Bird/Wildlife-Aircraft Strike Hazard

The types of aircraft operating at the SCLA, as well as airspace and runway use, would remain the same as the baseline. The air traffic control procedures, which accommodate the current level of activity, would continue to be used to control aircraft operations. The potential for aircraft accidents or bird/wildlife-aircraft strikes would remain at the baseline conditions. The risk would continue to be low that an aircraft involved in an accident at or around the SCLA would strike a person or structure on the ground. Likewise, it would continue to be unlikely that any of the bird/wildlife-aircraft strike incidents would involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

Noise

Noise would continue to be generated by aircraft operations. The number of persons exposed to noise and potentially highly annoyed would remain at the current levels (see Table 3.2-3). No persons would be exposed to CNEL 60 dBA and greater. The discussion for noise-induced hearing loss and structural damage for Travis AFB in Subchapter 4.1.1 also applies.

Land Use

Continuation of the current activities would be consistent with the land use categories in the SCLA planning guidance.

Air Quality

Emissions would continue to be generated by aircraft operations and other aircraft maintenance activities, as well as vehicle, boiler, generator, and fueling operations, and industrial processes. It is anticipated that emissions from these activities would continue at the baseline condition rates and would not violate regulatory guidance.

Biological Resources

The potential for adverse effects to biological resources on the SCLA would be minimized through the continued use of existing natural resources management plans.

Cultural Resources

There would be no LZ construction or operation activities; however, aircraft operations would continue at the baseline levels. The potential for impact on cultural resources would remain low due to routine airfield maintenance and aircraft operations activities. Cultural resources would continue to be managed in accordance with applicable federal and state procedures.

Cumulative Impacts

Aircraft operations, aircraft safety, and BASH. None of the other actions include aircraft operations. Therefore, there would be no cumulative impacts for aircraft operations, aircraft safety, and BASH when considering the No Action Alternative and the other actions.

Noise. None of the other actions include aircraft operations. Therefore, there would be no cumulative impacts for noise from aircraft operations when considering the No Action Alternative and the other actions. Aircraft noise would remain at levels identified for the baseline (see Figure 3-13). No construction would occur under the No Action Alternative. Thus, there would be no cumulative impacts for construction noise when considering the No Action Alternative and the other actions.

Land Use. The LZ would not be constructed and aircraft operations would not occur under the No Action Alternative. Thus, there would be no on- or off-installation

land use cumulative impacts when considering the No Action Alternative and the other actions.

Air Quality. The LZ would not be constructed and aircraft operations would not occur on an LZ under the No Action Alternative. There would be no cumulative impacts because no construction emissions would be generated by the No Action Alternative. Emissions from aircraft operations would continue at baseline levels.

Biological Resources. The LZ would not be constructed under the No Action Alternative. Thus, there would be no cumulative impacts for biological resources when considering the No Action Alternative and the other actions.

Cultural Resources. The LZ would not be constructed under the No Action Alternative. Thus, there would be no cumulative impacts for cultural resources when considering the No Action Alternative and the other actions.

4.1.3 Grant County Airport

Aircraft Operations, Aircraft Safety, and Bird/Wildlife-Aircraft Strike Hazard

The types of aircraft operating at the Grant County Airport, as well as airspace and runway use, would remain the same as the baseline. The air traffic control procedures, to include McChord AFB operations when the air traffic control tower is closed and which accommodate the current level of activity, would continue to be used to control aircraft operations. The potential for aircraft accidents or BASH incidents would remain at the baseline conditions. The risk would continue to be low that an aircraft involved in an accident at or around the Grant County Airport would strike a person or structure on the ground. Likewise, it would continue to be unlikely that any of the bird/wildlife-aircraft strike incidents would involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

Noise

Noise would continue to be generated by aircraft operations. The number of persons exposed to noise and potentially highly annoyed would remain at the current levels (see Table 3.3-2). The 2,085 persons exposed to DNL 65 dBA and greater would continue to equate to 17 percent of the persons who live within a 5-mile radius of the airfield. The discussion for noise-induced hearing loss and structural damage for Travis AFB in Subchapter 4.1.1 also applies.

Land Use

Continuation of the current activities would be consistent with the land use in the area surrounding the airport.

Air Quality

Emissions would continue to be generated by activities at the Grant County Airport such as aircraft operations and other aircraft maintenance, as well as vehicle, boiler, generator, and fueling operations, and industrial processes. It is anticipated that emissions from these activities would continue at the baseline condition rates and would not violate regulatory guidance.

Cultural Resources

LZ operations would remain at the baseline levels. The potential for impact on cultural resources would remain low due to routine airfield maintenance and aircraft operations activities. Cultural resources would continue to be managed in accordance with applicable federal and state procedures.

Cumulative Impacts

No other actions were identified for the Grant County Airport. Therefore, there would be no cumulative impacts when considering the No Action Alternative and other actions.

4.2 PROPOSED ACTION

A 3,500 foot-long, 90-foot wide LZ with 300 foot-long overruns at each end and connecting taxiways would be constructed 350 feet east of the main instrument runway (Runway 21L/03R) on existing Travis AFB property. Day/night LZ markings, and an IR lighting system for NVG operations would be installed. Additionally, Travis AFB aircrews would accomplish operations on the existing LZ at the Grant County Airport. Annually, approximately 8,169 C-17 (22.69 average daily) and 3,745 C-130 (10.40 average daily) operations would be accomplished at the Travis AFB LZ. Approximately 389 annual (1.08 average daily) additional operations would be accomplished on the existing LZ at the Grant County Airport.

4.2.1 Aircraft Operations, Aircraft Safety, and Bird/Wildlife-Aircraft Strike Hazard

4.2.1.1 Travis AFB

Aircraft Operations

Under the Proposed Action at Travis AFB, average daily airfield operations at the Base would increase by 33.09 operations from 221.81 to 254.90 operations (compare Tables 2.2-1 and 2.2-4), a 15 percent increase. Approximately 82,000 annual operations would occur under the Proposed Action at Travis AFB. The anticipated annual operations would equate to approximately 29 percent of the airfield capacity, an increase of 4 percent. Assuming nearly all operations occur primarily between 6:00 a.m. and 2:00 a.m., there would be 20 hours of operations per day for hourly capacity purposes. Based on a 20-hour day, the average IFR hourly operations would be about 13 operations,

approximately 24 percent of the hourly capacity (a 3 percent increase). The short distance (*i.e.*, 350 feet) between the LZ and Runway 21L/03R would preclude simultaneous operations on the two runways. Therefore, the LZ and the runway are considered as one runway for runway capacity purposes. The airfield has the capacity to accommodate the increase in operations.

Although C-17 new tactical departures, arrivals, and closed pattern events would be added to the flight track inventory for operations on the LZ, the track locations and aircraft profiles (*i.e.*, airspeed, altitude, and power settings) for the new tracks would be similar to those that occur under the baseline condition. The existing air traffic control procedures for the airspace surrounding the airfield and at the airfield would continue to accommodate the continued C-17 operations on Runways 21L/03R and 21R/03L as well as the existing and new aircraft ground tracks and increased operations on the LZ. As previously mentioned, the closeness of the LZ and Runway 21L/03R would require the operations on the two runways to be controlled as one runway.

Aircraft Safety

It is impossible to predict the precise location where an aircraft involved in an in-flight accident would impact the ground. However, aircraft flight tracks are developed to avoid overflying residences and built-up areas to the maximum extent practicable. The types of landing and takeoff operations the C-17s would accomplish at Travis AFB would be consistent with those currently flown at the Base, and the C-17 and C-130 Class A mishap rates listed in Table 3.1-1 also apply. For these reasons, the risk is low that an aircraft involved in an accident at or around the Travis AFB would strike a person or structure on the ground.

Bird/Wildlife-Aircraft Strike Hazard

Bird/wildlife-aircraft strike hazards can be assessed using a combination of bird distribution and behavior factors and aircraft operational factors. Some of these factors include:

- The size and behavior of the predominant bird species;
- The presence of specialized habitat or location that favors migration patterns or large concentrations of birds;
- The frequency and location of takeoffs and landings;
- The altitude of flight operations; and
- The flight characteristics of the aircraft, including size, airspeed, and number of engines.

Overall, aircraft operations at Travis AFB would increase by about 15 percent. Thus, there would be potential for an increase in bird/wildlife-aircraft strikes at Travis AFB. It is anticipated the altitude distribution of the additional strikes would follow the

data in Table 3.1-2 because the types of operations by aircraft operating at the airfield would be consistent with the types of operations associated with data in the table.

The potential for bird/wildlife- aircraft strikes could fluctuate as a result of the cyclical patterns of bird populations. Historically, one-half of 1 percent of all reported bird/wildlife-aircraft strikes involving Air Force aircraft resulted in a serious mishap. Therefore, it is unlikely that any of these bird/wildlife-aircraft strike incidents would involve injury either to aircrews or to the public, or damage to property (other than the aircraft).

4.2.1.2 Grant County Airport

Aircraft Operations

Under the Proposed Action at the Grant County Airport, average daily airfield operations at the Grant County Airport would increase by 1.08 operations from 218.42 to 219.50 operations (compare Tables 2.2-3 and 2.2-5), an increase of less than 1 percent. Approximately 80,000 annual operations would occur under the Proposed Action at the Grant County Airport. The anticipated annual operations would equate to approximately 23 percent of the airfield capacity, an increase of 1 percent. Assuming nearly all operations would occur primarily between 6:00 a.m. and 2:00 a.m., there would be 20 hours of operations per day for hourly capacity purposes. Based on a 20-hour day, the average IFR hourly operations would be about 11 operations, approximately 19 percent of the hourly capacity (no change from the baseline). The airfield has the capacity to accommodate the increase in operations.

Aircrews from Travis AFB would schedule operations at the Grant County Airport through McChord AFB. This would ensure compliance with the McChord AFB-Grant County Airport agreement that states the maximum number of C-17s operating at the airport would not exceed two aircraft and would not operate between 2:00 a.m. and 7:00 a.m. (Ryan 2007).

As mentioned in Subchapter 3.3.1.1, C-17 aircraft accomplish operations on Runways 14R/32L and 04/22 and tactical training operations on the LZ (Runway 09/27) under the baseline condition. No new tactical departure, arrival, and closed pattern events would be added and Travis AFB aircrews would use the existing tracks for operations at the airfield. The existing air traffic control procedures for the airspace surrounding the airfield and at the airfield would accommodate the proposed C-17 operations at the airfield.

Aircraft Safety

It is impossible to predict the precise location where an aircraft involved in an in-flight accident would impact the ground. However, aircraft flight tracks are developed to avoid overflying residences and built-up areas to the maximum extent practicable. The types of landing and takeoff operations the C-17s would accomplish at the Grant County Airport would be consistent with those currently flown at the airport, and the C-17 Class A

mishap rate listed in Table 3.1-1 also applies because the data include operations at non-military airfields. For these reasons, the risk is low that an aircraft involved in an accident at or around the Grant County Airport would strike a person or structure on the ground.

Bird/Wildlife-Aircraft Strike Hazard

The background information in Subchapter 4.2.1.1 concerning the behavior factors of birds/wildlife and aircraft operational factors also applies to the alternative. Overall, aircraft operations at the Grant County Airport would increase by less than 1 percent. Thus, there would be potential for a corresponding slight increase in bird/wildlife-aircraft strikes at the airport. It is anticipated the altitude distribution of the additional strikes would follow the data in Table 3.1-2 because the types of operations by aircraft operating at the airfield would be consistent with the types of operations associated with data in the table. The discussion and analysis concerning the number of bird/wildlife-aircraft strikes that result in serious mishap in Subchapter 4.2.1.1 also apply.

4.2.1.3 Mitigation

There would be no significant impacts. No mitigation is recommended.

4.2.1.4 Cumulative Impacts

None of the other actions at Travis AFB include aircraft operations. Therefore, there would be no cumulative aircraft operations, aircraft safety, or BASH impacts.

4.2.2 Noise

4.2.2.1 Travis AFB

Noise associated with the Proposed Action at Travis AFB would be generated by aircraft operations and construction activities.

Aircraft Noise

Figure 4-1 shows the aircraft ground tracks and Figure 4-2 depicts the noise exposure area at the Base after the LZ would be constructed and aircraft operations occur at the projected levels. Figure 4-3 compares the Proposed Action at Travis AFB and the No Action Alternative noise contours. The aircraft operations modeled include the average busy day aircraft operations for the Proposed Action at Travis AFB (see Table 2.2-4).

Single Event Noise Analysis

Each aircraft overflight yields a single-event noise level, presented as SEL. C-17 and C-130 aircraft, which currently operate at Travis AFB, would also accomplish operations on the LZ after it is constructed. Thus, Travis AFB and surrounding areas

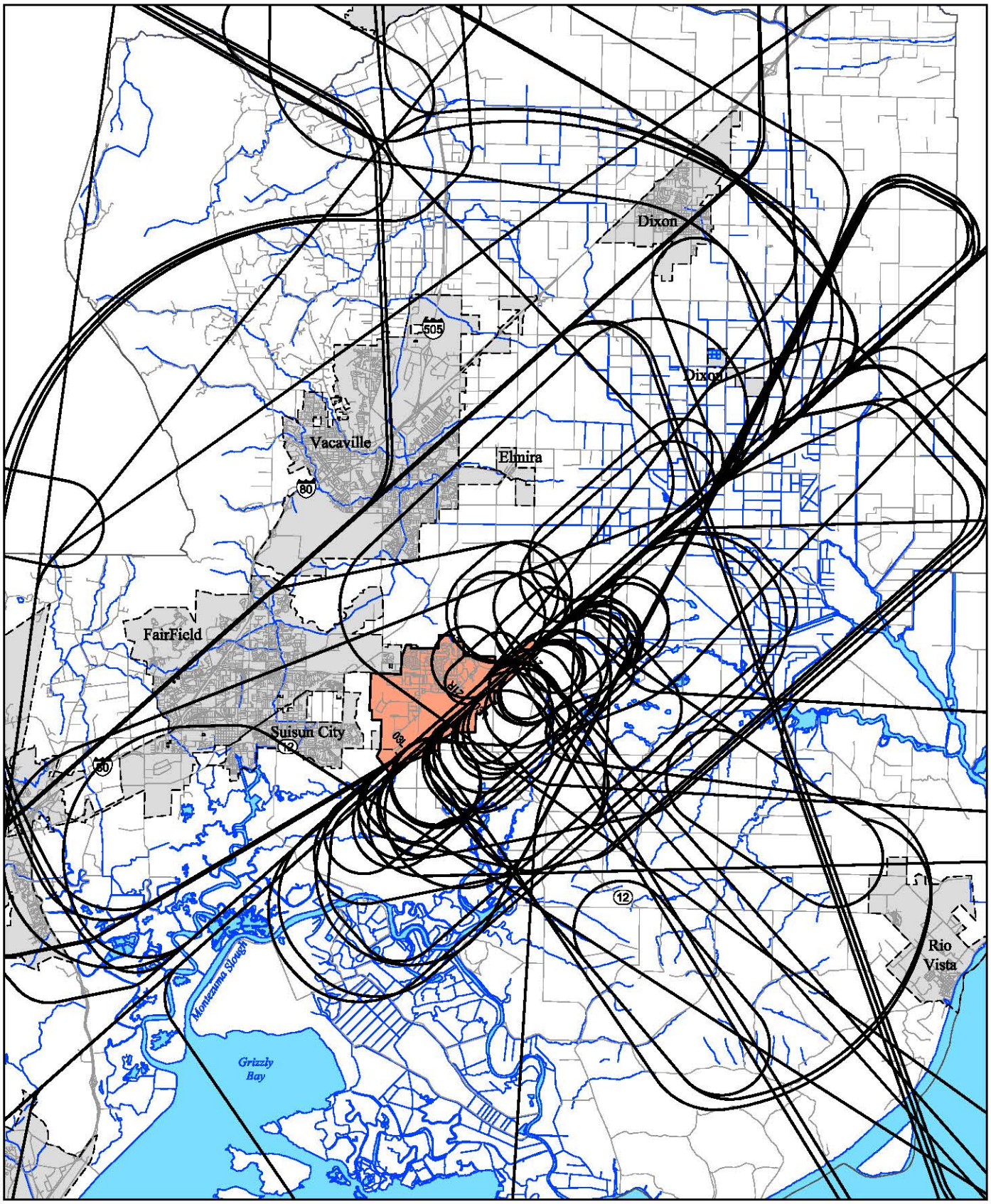
would continue to be exposed to SELs from C-17s and C-130s at the levels listed in Table 3.1-3. The greatest SEL values for the aircraft based at Travis AFB would continue to be produced by C-5 aircraft, which, respectively, are 9 and 14 dBA louder than the C-17 and C-130 at distances of 200 feet from the aircraft.

Based on FICAN recommendations, outdoor SELs of 80 to 100 dBA (60 to 80 dBA indoors) could result in 4 to 10 percent awakenings, respectively, in the exposed population. Over the course of sleeping, different individuals might be awakened by different events, and some individuals might be awakened more than once. Individuals in residences in the area around the Base would continue to be exposed to indoor SEL of 60 to 80 dBA during normal sleep periods (10:00 p.m. to 7:00 a.m.). There would be a combined total of eight additional off-installation persons exposed to CNEL 60 dBA and greater as a result of the Proposed Action at Travis AFB. Assuming the number of sleep awakenings would be proportional to the increase in exposed population and that 10 percent of the persons would be awakened, about one additional person potentially could be awakened when comparing the Proposed Action at Travis AFB to the baseline condition. Those individuals who sleep between 7:00 a.m. and 10:00 p.m. likely would be affected just as those persons who sleep during normal nighttime sleep periods.

Nearby schools would continue to be exposed to noise from aircraft operations. Assuming schools conduct teaching for an approximate 8-hour period (8:00 a.m. through 4:00 p.m.), about 40 percent of the 20-hour flying day would occur when classroom activities occur. Thus, approximately 40 percent (*i.e.*, 13.24 operations) of the combined additional 33.09 average daily operations (*i.e.*, 22.69 C-17 and 10.40 C-130) would occur during school time. Based on an 8-hour school day and 13.24 operations, there would be an average of about 1.7 additional overflight per hour that could interfere with classroom activities in schools that would be overflown.

Research on the effects of aircraft noise on student learning suggests that aircraft noise can interfere with learning in the following areas: reading; motivation; language and speech acquisition; and memory (FICAN 2000). Research to date supports the following findings:

- "Reading. The strongest finding of a relationship between aircraft noise and learning is in the area of reading. More than 20 studies have found that children in noise impact zones are negatively affected by aircraft noise." (FICAN 2000).
- "Motivation. Approximately a dozen laboratory and field studies indicate reduced task persistence in relation to uncontrollable noise." (FICAN 2000).

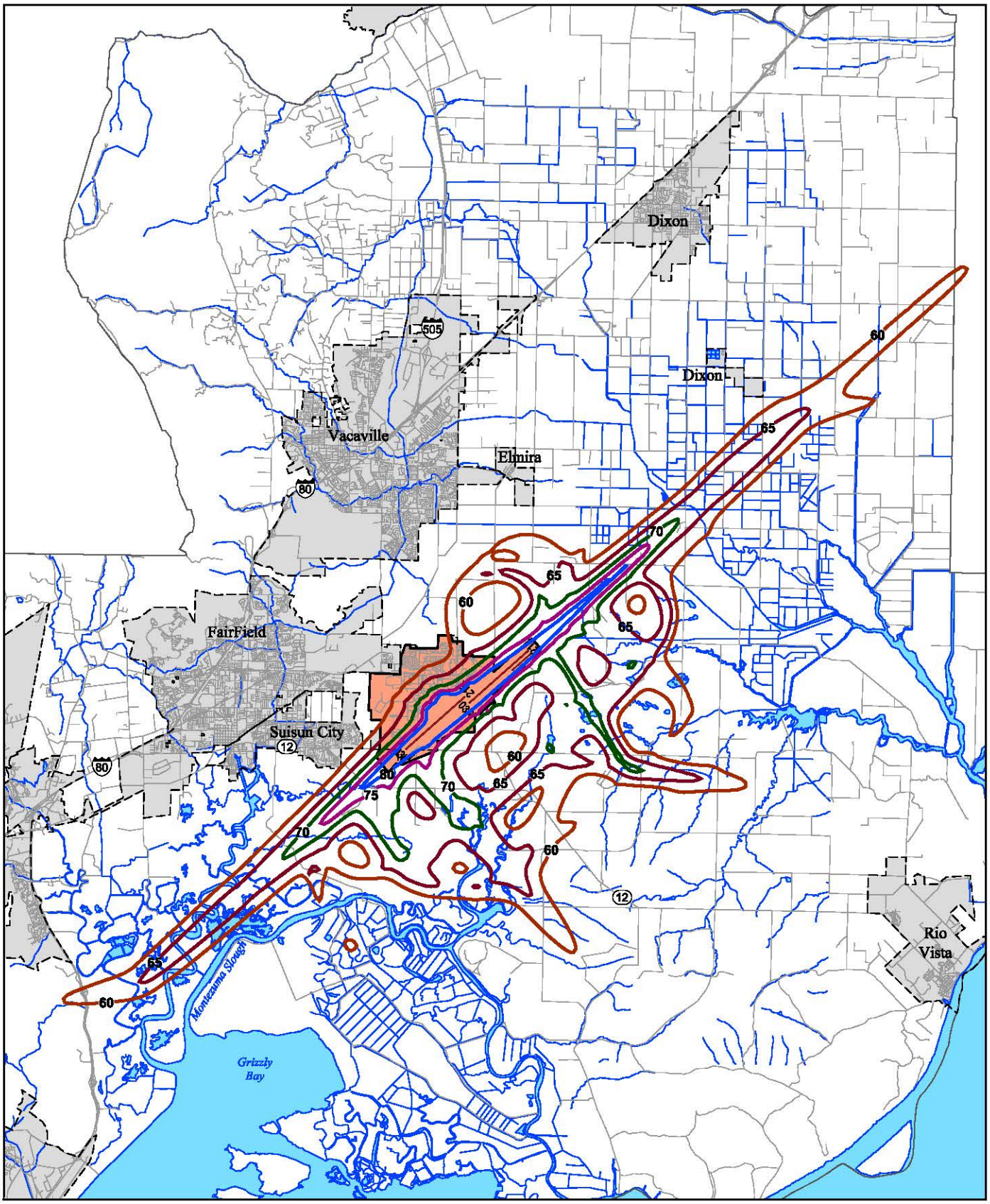


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Proposed Action Aircraft Ground Tracks at Travis AFB

Figure 4-1

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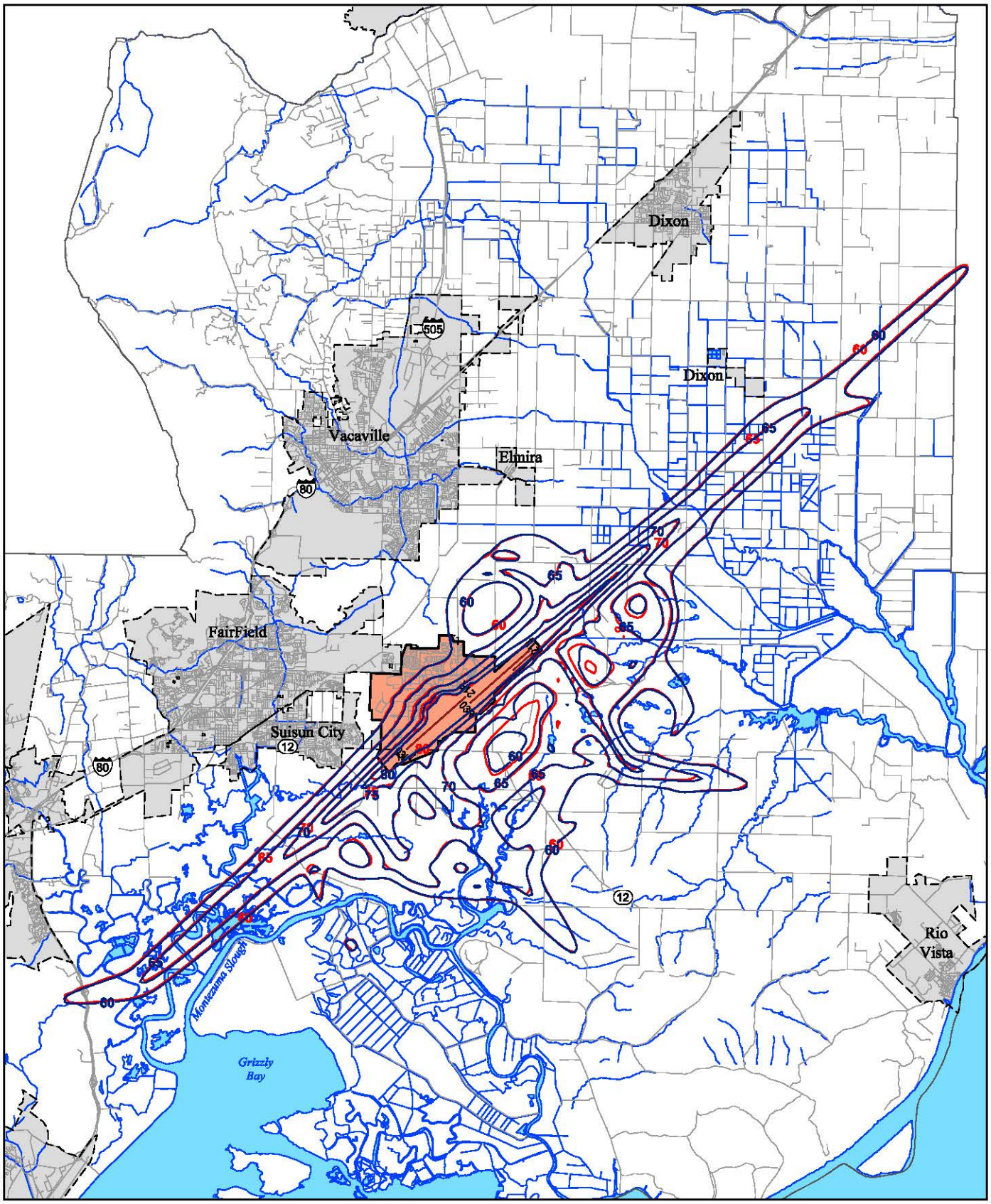


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Proposed Action Noise Contours at Travis AFB

Figure 4-2

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Travis AFB

LEGEND

- No Action Alternative Noise Contours
- Proposed Action Noise Contours
- Runway
- Roadway
- City Limits
- Travis AFB

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Feet

Comparison of No Action Alternative and Proposed Action Noise Contours at Travis AFB

Figure 4-3

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- "Language and Speech. A small number of studies suggest delayed language acquisition and interference with speech perception in noisy areas." (FICAN 2000).
- "Memory. A few studies suggest deficits in short- and long-term memory recall in the presence of noise, particularly for more complex material under noise." (FICAN 2000).

Table 4.2-1 contains at-ear noise exposure levels that produce negligible hearing loss of no more than 5 dB for both an eight-hour and 24-hour exposure on a yearly and working day basis. The eight-hour data assume the remaining 16 hours of the day are spent in relative quiet (USEPA 1974). According to USEPA (1974), changes in hearing levels of 5 dB are generally not considered noticeable or significant. As shown in Figure 3-3, the average noise (L_{eq} in Table 4.2-1) from a noise producing event is less than the L_{max} or SEL from the event. Based on the level of noise exposure from the Proposed Action aircraft operations at Travis AFB, it is doubtful that an individual would be exposed to the noise levels and exposure conditions in Table 4.2-1 and at which hearing loss could occur.

Table 4.2-1 At-Ear Exposure Levels that Produce No More than 5 dB Noise-Induced Hearing Damage over a 40-Year Period

Exposure	Steady (continuous) Noise	Intermittent Noise	With Margin of Safety
L_{eq} 8-Hour			
250 days per year	73.0	78.0	--
365 days per year	71.4	76.4	75.0
L_{eq} 24-Hour			
250 days per year	68.0	73.0	--70.0
365 days per year	66.4	71.4	--

Source: USEPA 1974.

Averaged Noise Analysis

Table 4.2-2 compares the Proposed Action at Travis AFB with the No Action Alternative (*i.e.*, baseline) for the following: off-Base land area and population exposed to noise of CNEL 60 dBA and greater; and the population potentially highly annoyed.

Overall, the Proposed Action at Travis AFB noise contours would be very similar to the No Action Alternative (*i.e.*, baseline) contours (see Figure 4-3), with the number of off-Base acres in the CNEL 60 dBA and greater exposure area increasing by 1 percent.

Table 4.2-2 Summary of Off-Base Land Area and Population Exposed to, and Population Potentially Highly Annoyed by CNEL 60 dBA and Greater, Proposed Action at Travis AFB

	CNEL Interval (dBA)					
Category	**60-65**	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres						
No Action Alternative	21,876	15,283	4,225	1,470	287	43,141
Proposed Action at Travis AFB	21,938	15,600	4,516	1,386	357	43,797
Change	+62	+317	+291	-84	+70	+656
Percent Change	0%	+2%	+7%	-6%	+24%	+1%
Population						
No Action Alternative	254	102	13	6	0	375
Proposed Action at Travis AFB	261	101	14	6	0	382
Change	+7	-1	+1	0	0	+7
Percent Change	+3%	-1%	+8%	0%	0%	+2%
Population Potentially Highly Annoyed						
No Action Alternative	30	22	5	3	0	60
Proposed Action at Travis AFB	31	22	5	3	0	61
Change	+1	0	0	0	0	+1
Percent Change	+3%	0%	0%	0%	0%	+2%

Note: The No Action Alternative also is the baseline. Acres reflect only off-Base land area. People highly annoyed determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1-4.

People would continue to be exposed to aircraft noise in four of the five noise zones (see Table 4.2-2), with the CNEL 60-65 dBA noise zone containing 261 of the 382 persons exposed to CNEL 60-dBA and greater. These 382 persons would equate to 1 percent of the estimated 64,492 persons (based on 2000 census data) who live within the approximate 5-mile radius area associated with airfield airspace environment, the same percentage of exposure when compared to the No Action Alternative (*i.e.*, baseline). The overall number of persons who could be potentially highly annoyed by noise exposure would be 61 people, or one additional person when compared to the No Action Alternative (baseline).

The contribution of outdoor noise to indoor noise is usually small. The effect of an outdoor noise source inside a building depends on the intensity of the source and the noise level reduction of the building. Noise level reduction provided by a building can be categorized into those constructed in warm climates and those in cold climates. Additionally, the noise level reduction of a building also depends on whether the windows are opened or closed (USEPA 1974). Table 4.2-3 presents typical noise level reduction for the two categories of buildings and the window open/closed condition and approximate national average noise level reduction. Based on Travis AFB's location, the warm climate data would apply to buildings on and in the area surrounding the Base.

Table 4.2-3 Typical Noise Level Reductions of Buildings

Climate/National Average	Windows Open	Windows Closed
Warm Climate	12 dB	24 dB
Cold Climate	17 dB	27 dB
Approximate National Average	15 dB	25 dB

Source: USEPA 1974.

Nonauditory health effects of long-term noise exposure, where noise may act as a risk factor, were never found to occur at levels below those protective against noise-induced hearing loss. Most studies attempting to clarify such health effects found that noise exposure levels established for hearing protection would also protect against any potential nonauditory health effects, at least in workplace conditions. The best scientific summary of these findings is contained in the lead paper at the National Institute of Health Conference on Noise and Hearing Loss, held on 22-24 January 1990 in Washington, D.C.

"The nonauditory effects of chronic noise exposure, when noise is suspected to act as one of the risk factors in the development of hypertension, cardiovascular disease, and other nervous disorders, have never been proven to occur as chronic manifestations at levels below these criteria (an average of 75 dBA for complete protection against hearing loss for an 8-hour day). At the 1988 International Congress on Noise as a Public Health Problem, most studies attempting to clarify such health effects did not find them at levels below the criteria protective of noise-induced hearing loss, and even above these criteria, results regarding such health effects were ambiguous. Consequently, one comes to the conclusion that establishing and enforcing exposure levels protecting against noise-induced hearing loss would not only solve the noise-induced hearing loss problem but also any potential nonauditory health effects in the work place." (Von Gierke 1990).

Although these findings were directed specifically at noise effects in the work place, they are equally applicable to aircraft noise effects in the community environment. Research studies regarding the nonauditory health effects of aircraft noise are ambiguous, at best, and often contradictory. Yet, even those studies, which purport to find such health effects, use time-average noise levels of 75 dBA and higher for their research. It is unlikely that individuals would be exposed to aircraft noise at these levels for an 8-hour day. Thus, nonauditory health effects from chronic noise exposure would not occur due to the Proposed Action at Travis AFB.

Studies of aircraft noise and sonic booms, both in the United States and overseas, have addressed acute effects, including effects of startle responses (sheep, horses, cattle, fowl), and effects on reproduction and growth (sheep, cattle, fowl, swine); parental behaviors (fowl, mink); milk letdown (dairy cattle, dairy goats, swine); and egg production. High noise may trigger a startle response that raises the heart rate, but heart rate returns to normal in a very short time. There are good dose-response relationships describing the startle tendency to various levels of noise. However, studies have determined that there would be no long-term behavioral nor breeding effects. Thus, it is unlikely that the noise from the additional Proposed Action at Travis AFB aircraft

operations would cause long-term behavioral or breeding effects to domestic exposed to aircraft noise.

Effects of Noise on Structures

As discussed in Subchapter 3.1.2.2, L_{max} is used to determine the potential effects to structures from sound. The L_{max} is the highest instantaneous sound pressure during a single noise event, no matter how long the sound may persist. No damage would occur to structures in the area surrounding Travis AFB from C-17 and C-130 LZ operations because the L_{max} produced by the aircraft (*i.e.*, 113 and 100 dBA at 200 feet from the aircraft) would not exceed the level at which structural damage could occur. The greatest SEL values for aircraft based at Travis AFB would continue to be produced by the C-5, which is 12 dBA louder than the C-17.

Construction Noise

Assuming that noise from equipment radiates equally in all directions, the sound intensity would diminish inversely as the square of the distance from the source. Therefore, in a free field (no reflections of sound), the sound pressure level decreases 6 dB with each doubling of the distance from the source. Under most conditions, reflected sound will reduce the attenuation due to distance. Doubling the distance in a reflected sound condition may only result in a decrease of 4 to 5 dB. Table 4.2-4 shows the sound pressure levels at a distance of 50 feet for miscellaneous heavy equipment used for construction.

Table 4.2-4 Heavy Equipment Noise Levels Measured at 50 Feet

Equipment Type	Number Used[1]	Generated Noise Levels, L_p (dB[2])
Bulldozer	1	88
Backhoe (rubber tire)	1	80
Front Loader (rubber tire)	1	80
Concrete Truck	1	75
Concrete Finisher	1	80
Crane	1	75
Asphalt Spreader	1	80
Roller	1	80
Flat Bed Truck (18 wheel)	1	75
Scraper	1	89
Trenching Machine	1	85

Note: Assuming that noise from the construction and demolition equipment radiates equally in all directions, the sound intensity would diminish inversely as the square of the distance from the source. Therefore, in a free field (no reflections of sound), the Lp decreases 6 dB with each doubling of the distance from the source. Under most conditions, reflected sound will reduce the attenuation due to distance. Therefore, doubling the distance may only result in a decrease of 4 to 5 dB (AIHA 1986).

1 Estimated number in use at any time.

2 L_p = sound pressure level

Source: CERL 1978.

The primary source of noise from LZ construction would be from equipment and vehicles involved in construction work. Typical noise levels generated by these activities range from 75 to 89 dBA at 50 feet from the source. Noise receptors in the vicinity of these short-term activities could include persons outside the Base boundary and individuals near the construction site.

For analysis purposes, it is estimated the shortest distance between a construction noise source and a receptor would be about 100 feet. Conservatively, outdoor noise for a receptor could range from as high as 71 to 85 dB at 100 feet from the source (see note in Table 4.2-4). However, the noise level could be lower if the sound is not reflected. Indoor noise levels are generally 18 to 27 dBA lower than outdoor noise levels because building structures attenuate the outdoor noise levels. Construction activities likely would occur between 7:30 a.m. and 4:30 p.m., 5 days per week for the duration of the LZ construction activities. The noise would be temporary and occur only during the hours that construction activity would occur and would cease when the project is completed.

Based on data in Table 3.1-4, 61 percent of the persons exposed to DNL 85 dBA could be potentially highly annoyed from the construction noise. No hearing loss would occur for persons outdoors because they would not be exposed to DNL equal to or greater than 75 dBA for 40 years of exposure at 16 hours per day, the level at which hearing loss could occur. Sleep interference is unlikely because construction and demolition activities would occur during daytime.

Elevated noise levels can interfere with speech, causing annoyance or communication difficulties. Based on a variety of studies, DNL 75 dBA indicates a good probability for frequent speech disruption. This level produces ratings of "barely acceptable" for intelligibility of spoken material. Persons conducting conversations within the project area could have their speech disrupted by construction-generated noise. Speech disruption would be temporary, lasting only as long as the noise-producing event.

4.2.2.2 Grant County Airport

Noise associated with the Proposed Action at the Grant County Airport would be generated by aircraft operations. There would be no change to the aircraft ground tracks depicted in Figure 3-15 as a result of the Proposed Action at the Grant County Airport. Figure 4-4 depicts the noise exposure area at the airport under the Proposed Action at the Grant County Airport. Figure 4-5 compares the Proposed Action at the Grant County Airport and the No Action Alternative noise contours. The aircraft operations modeled include the average busy day aircraft operations for the Proposed Action at the Grant County Airport (see Table 2.2-5).

Single Event Noise Analysis

Each aircraft overflight yields a single-event noise level, presented as SEL. C-17 aircraft, which currently operate at the Grant County Airport, would continue to accomplish operations at the airport and on the LZ. Thus, the Grant County Airport and

surrounding areas would continue to be exposed to SELs from C-17s at the levels listed in Table 3.3-1. The greatest SEL values for the aircraft operating at the Grant County Airport would continue to be produced by EA-6B aircraft, which are 11 dBA louder than the C-17.

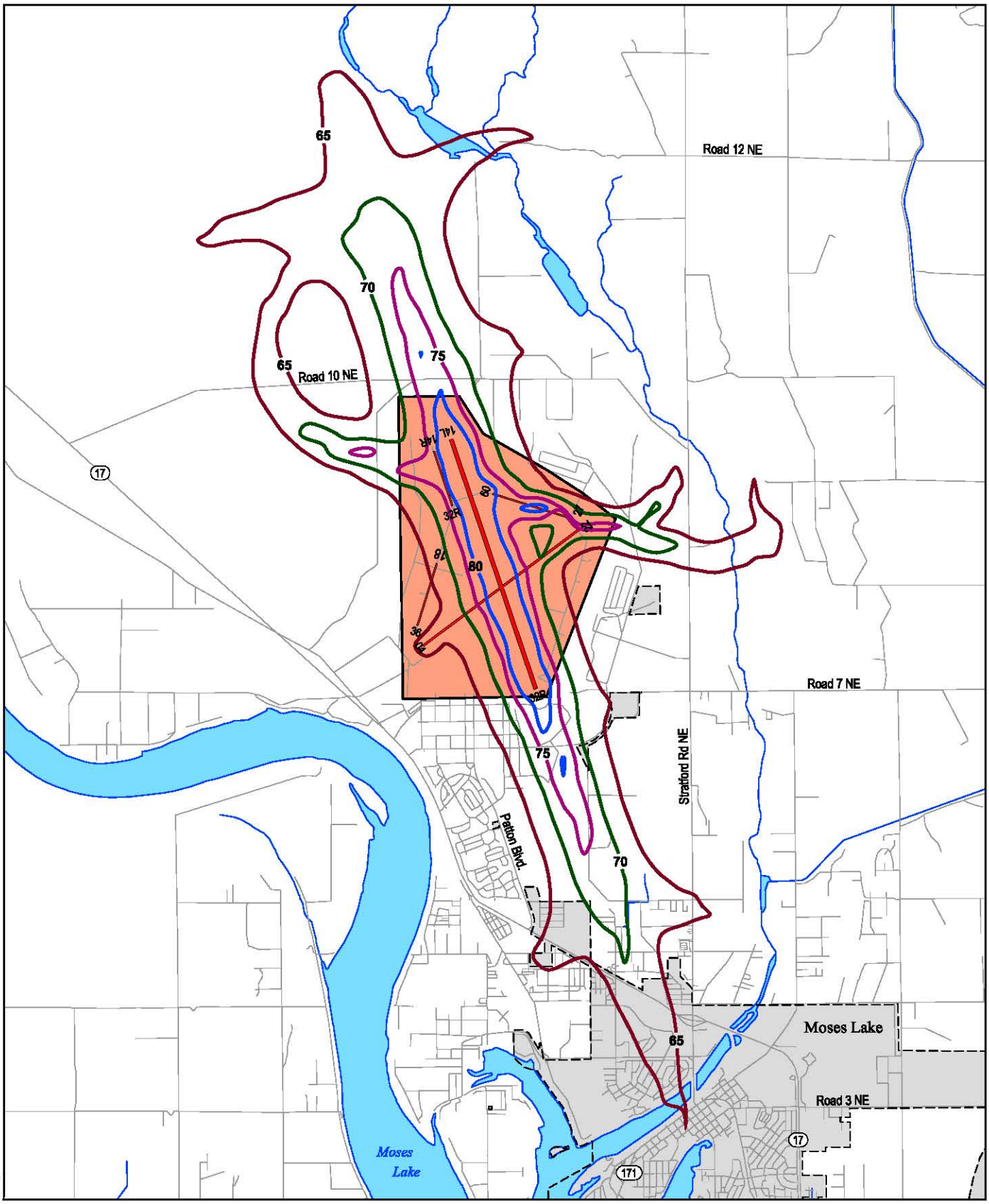
The induced hearing data in Table 4.2-1 and related discussion in Subchapter 4.2.2 for the Proposed Action at Travis AFB also apply. Based on the level of noise exposure from the Proposed Action at the Grant County Airport, it is doubtful that an individual would be exposed to noise that would produce hearing loss.

Nearby schools would continue to be exposed to noise from aircraft operations. Assuming schools conduct teaching for an approximate 8-hour period (8:00 a.m. through 4:00 p.m.), about 40 percent of the 20-hour flying day would occur when classroom activities occur. Thus, approximately 40 percent of the additional 1.08 average daily C-17 operations (*i.e.*, 0.4 operations) would occur during school time. Based on an 8-hour school day and 0.4 operations, there would be an average of less than one additional overflight per hour that could interfere with classroom activities in schools that would be overflown.

Based on FICAN recommendations, outdoor SELs of 80 to 100 dBA (60 to 80 dBA indoors) could result in 4 to 10 percent awakenings, respectively, in the exposed population. Over the course of sleeping, different individuals might be awakened by different events, and some individuals might be awakened more than once. Individuals in residences in the area around the airport would continue to be exposed to indoor SEL of 60 to 80 dBA during normal sleep periods (10:00 p.m. to 7:00 a.m.). There would be a combined total of six additional off-airport persons exposed to DNL 65 dBA and greater as a result of the Proposed Action at the Grant County Airport. Assuming the number of sleep awakenings would be proportional to the increase in exposed population and that 10 percent of the persons would be awakened, about one additional person potentially could be awakened when comparing the Proposed Action at the Grant County Airport to the baseline condition. Those individuals who sleep between 7:00 a.m. and 10:00 p.m. likely would be affected just as those persons who sleep during normal nighttime sleep periods.

Averaged Noise Analysis

Table 4.3-5 compares the Proposed Action at the Grant County Airport with the No Action Alternative (*i.e.*, baseline) for the following: off-airport land area and population exposed to noise of DNL 65 dBA and greater; and the population potentially highly annoyed. Overall, the Proposed Action at the Grant County Airport noise contours would be nearly identical to the No Action Alternative (*i.e.*, baseline) (see Figure 4-5), with the number of off-airport acres in the DNL 65 dBA and greater exposure area increasing by 1 percent. People would continue to be exposed to aircraft noise in three of



Grant County Airport

LEGEND

- DNL 65 dBA Contour
- DNL 70 dBA Contour
- DNL 75 dBA Contour
- DNL 80 dBA Contour
- Runway
- Roadway
- City Limits
- Grant County International Airport

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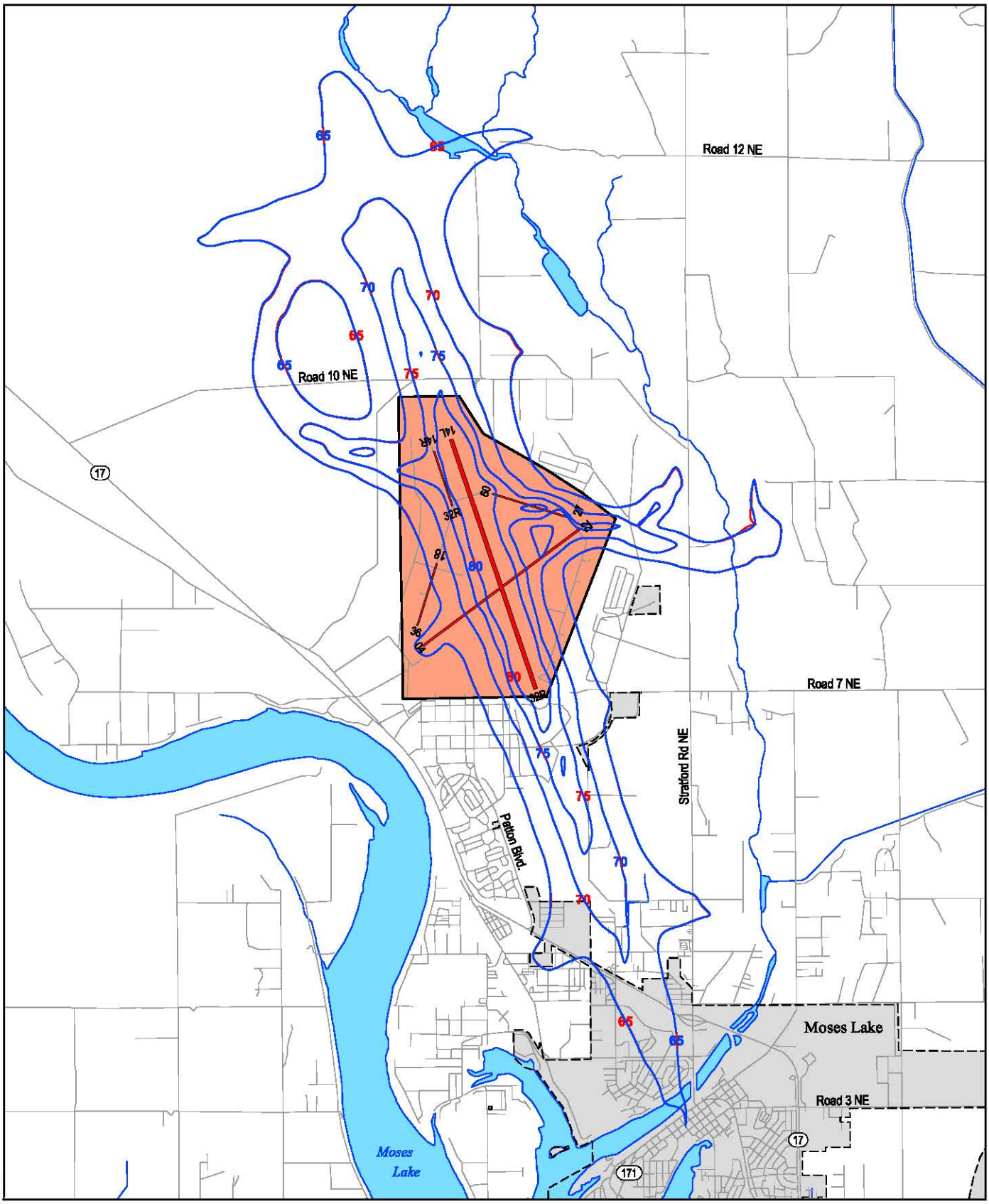
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Proposed Action Noise Contours at Grant County Airport

Figure 4-4

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Comparison of No Action Alternative and Proposed Action Noise Contours at Grant County Airport

Figure 4-5

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the four noise zones (see Table 4.2-5), with the DNL 65-70 dBA noise zone containing 1,974 of the 2,091 persons exposed to DNL 65-dBA and greater. These 2,091 persons would equate to 17 percent of the estimated 12,373 persons (based on 2000 census data) who live within the approximate 5-mile radius area associated with airfield airspace environment, or no change when compared to the No Action Alternative (*i.e.*, baseline). The overall number of persons who could be potentially highly annoyed by noise exposure would be 478 people, or two additional persons when compared to the No Action Alternative (baseline).

Table 4.2-5 Summary of Off-Airport Land Area and Population Exposed to, and Population Potentially Highly Annoyed by DNL 65 dBA and Greater, Proposed Action at Grant County Airport

Category	DNL Interval (dBA)				Total
	65-70	70-75	75-80	80+	
Acres					
No Action Alternative	4,446	1,354	427	35	6,262
Proposed Action at the Grant County Airport	4,471	1,362	429	35	6,297
Change	+25	+8	+2	0	+35
Percent Change	+1%	+1%	0%	0%	+1%
Population					
No Action Alternative	1,969	114	2	0	2,085
Proposed Action at the Grant County Airport	1,974	115	2	0	2,091
Change	+5	+1	0	0	+6
Percent Change	+0%	+1%	0%	0%	+0%
Population Potentially Highly Annoyed					
No Action Alternative	433	42	1	0	476
Proposed Action at the Grant County Airport	434	43	1	0	478
Change	+1	+1	0	0	+2
Percent Change	0%	+2%	0%	0%	+0%

Note: The No Action Alternative is also the baseline. Acres reflect only off-Base land area. People highly annoyed is determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1-4.

The data in Table 4.2-3 and related discussion and analysis for the contribution of outdoor noise to indoor noise for the Proposed Action at Travis AFB in Subchapter 4.2.2 also apply. Based on the location of the Grant County Airport, the cold climate data would apply to buildings on and in the area surrounding the airport. The discussion and analyses for nonauditory health effects and the effects of aircraft noise on farm animals for the Proposed Action at Travis AFB in Subchapter 4.2.2.1 also apply.

Effects of Noise on Structures

As discussed in Subchapter 3.1.2.2, L_{max} is used to determine the potential effects to structures from sound. The L_{max} is the highest instantaneous sound pressure during a single noise event, no matter how long the sound may persist. No damage would occur to structures in the area surrounding the Grant County Airport from C-17 LZ operations

because the L_{max} produced by the aircraft (*i.e.*, 113 dBA at 200 feet from the aircraft) would not exceed the level at which structural damage could occur.

4.2.2.3 Mitigation

There would be no significant impacts. No mitigation is recommended.

4.2.2.4 Cumulative Impacts

None of the other actions at Travis AFB includes aircraft noise. Therefore, cumulative noise analysis applies only to construction. Based on the distance from the LZ construction site to the closest other action construction site, noise from LZ construction would attenuate to levels that, when combined with the noise from other action construction, would not produce cumulative impacts.

4.2.3 Land Use

4.2.3.1 Travis AFB

On-Base land use conflicts would not be expected from the construction and operation of the LZ. Land uses would be compatible with the general character of existing and planned Base land use patterns. The Travis AFB General Plan incorporated mission scenarios such as the Proposed Action in the future land use and future development components of the General Plan.

Air Force Engineering Technical Letter 04-7 establishes imaginary surfaces for LZs. The following imaginary surfaces would be included in the update to the Travis AFB AICUZ Study that would be accomplished to reflect establishment and operation of the LZ:

- A 1,000-foot exclusion area centered on the longitudinal axis of the runway (500 feet to each side of the LZ centerline) for LZs in built up and occupied areas. The width of the exclusion area in unoccupied areas is 700 feet (350 feet to each side of the runway centerline). The purpose of the exclusion area is to restrict development around the LZ. Only features necessary to operate the LZ are permitted in the area. Only features required to operate the LZ are permissible, such as operational surfaces (*e.g.*, taxiways, aprons), navigational aids, aircraft and support equipment, and cargo loading and unloading areas and equipment.
- A CZ that extends outward 500 feet from the end of the runway, is centered on the end of the runway, and is 320 feet wide at the end of the runway for C-17s, flaring to 500 feet in width at the outer end. The purpose of the CZ is to provide a reasonable level of safety. Only properly sited navigation aids are allowed.
- An APZ that begins at the outer end of the CZ, extends outward 2,500 feet, and is 1,000 feet wide in occupied and built-up areas (500 feet in unoccupied area). The APZ has a significant potential for accidents and, therefore, land use is a concern.

Activities that would impair visibility, produce electrical and light emissions, attract birds or waterfowl, and troop concentrations should be limited.

Figure 4-6 depicts the approximate locations of the imaginary surfaces that would be established for the LZ as well as the existing CZs and APZs for Runways 21L/03R and 21R/03L. As noted in Figure 4-6, the exclusion area, CZ, and southwestern APZ for the LZ would occur entirely on Travis AFB property. A portion of the northeastern LZ APZ would occur off Travis AFB property. However, the off-Base portion of the LZ APZ would occur within the existing CZ at the northeastern end of Runway 21L/03R. The land use limitations associated with a runway CZ (*e.g.*, only structures associated with aircraft operations are permitted) are more restrictive than those for an LZ APZ (see preceding paragraph). There would be no change in the location or the dimensions of CZs, APZs, or imaginary surfaces associated with Runways 21Left/03Right and 03Left/21Right. For these reasons, adding the LZ imaginary surfaces to the Travis AFB AICUZ Study would not recommend land uses that would be more restrictive than the current Study.

In accordance with AICUZ program guidance, Travis AFB may provide the Proposed Action at Travis AFB noise contours and the land use sections of NEPA documentation and any other relative data to local planning agencies to serve as an interim AICUZ report. A full update to the Travis AFB AICUZ Report would be provided to the community within 1 year after the completed mission change, funding and other constraints permitting.

As mentioned in Subchapter 4.2.2.1, the Proposed Action at Travis AFB noise contours would be nearly identical to the No Action Alternative (*i.e.*, baseline) contours (see Figure 4-3). Figure 4-7 compares the Proposed Action at Travis AFB noise contours with the ALUC noise contours. As shown in the figure, the Proposed Action at Travis AFB noise contours would not extend outward from the runway as far as the ALUC noise contours. Thus, the Proposed Action at Travis AFB would be consistent with the Solano County ALUC and City of Fairfield General Plan.

4.2.3.2 Grant County Airport

As depicted in Figure 4-5, the noise contours for the Proposed Action at the Grant County Airport are nearly identical to the No Action Alternative (baseline) noise contours. Therefore, land use plans for the local community would not be affected. The Proposed Action at the Grant County Airport would not require the airport to update or revise its 2005 Airport Master Plan or affect the FAR Part 77 imaginary surfaces or RPZs.

4.2.3.3 Mitigation

There would be no significant impacts. No mitigation is recommended.

4.2.3.4 Cumulative Impacts

Other facilities would be constructed on Travis AFB; however, none of the other facilities would be constructed in the general area associated with LZ. As with the LZ, the other facility actions would be compatible with the Travis AFB General Plan. Thus, facility construction associated with the Proposed Action and the other actions would be consistent with existing and future land use plans and programs identified in the General Plan.

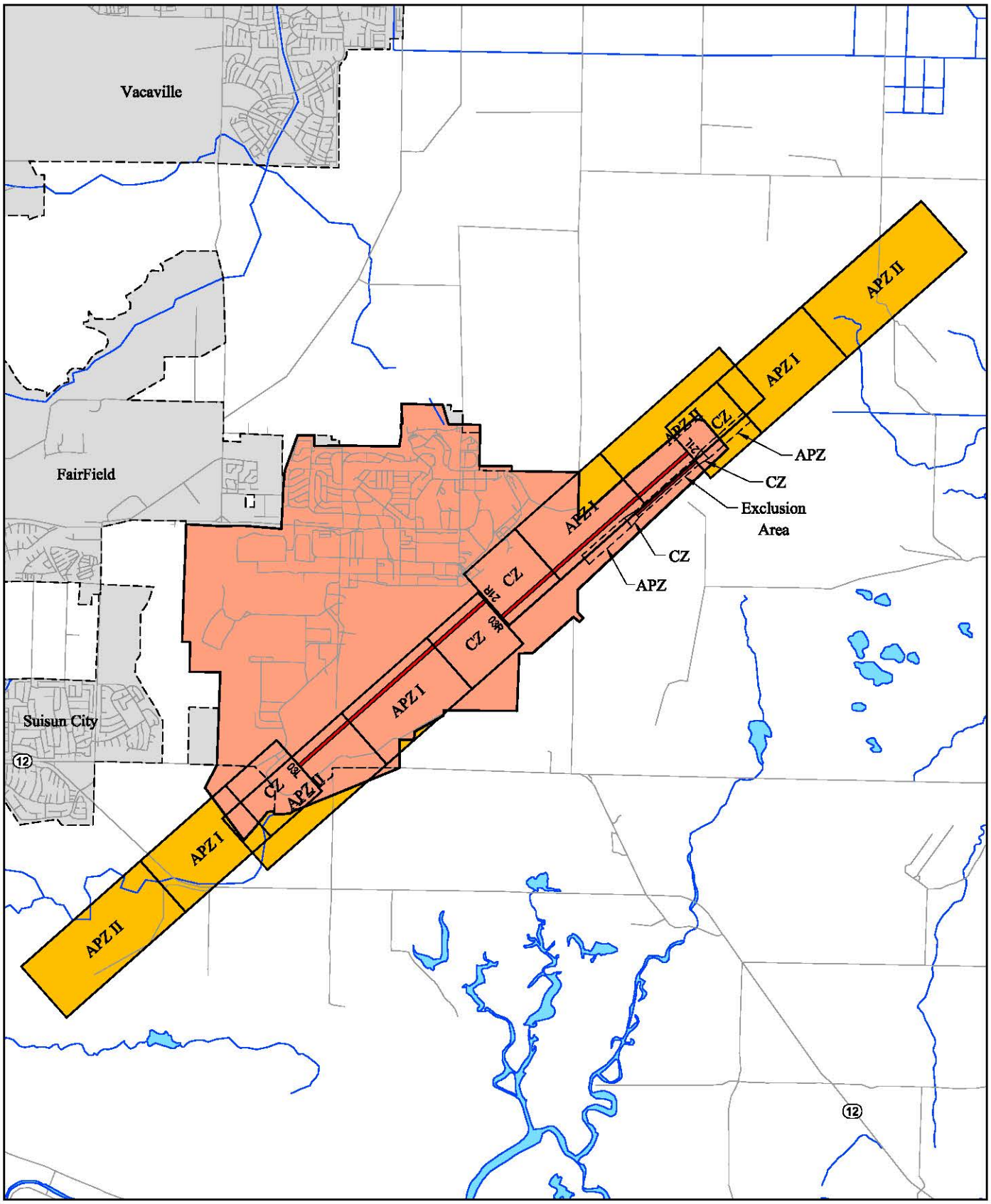
4.2.4 Air Quality

4.2.4.1 Travis AFB

Table 4.2-6 compares the net change in emissions resulting from the Proposed Action at Travis AFB with *de minimis* thresholds for AQCR 30 and states whether or not the emissions exceed *de minimis* or would be regionally significant. Emission factors from the USEPA were used to calculate construction emissions. These factors include on-site construction equipment and workers' travel. Concrete batch plant operations, including truck trips for materials and hauling to the landing zone construction area were also included. Construction emissions are short-term and would not occur after LZ construction is completed. As a result, construction emissions are not combined with long-term recurring aircraft operations emissions to determine regional significance or for comparison with *de minimis* thresholds to determine if a General Conformity determination is necessary.

A CAA General Conformity Applicability Analysis was prepared for the Proposed Action at Travis AFB (USAF 2007) and the data from the Analysis are reflected in Table 4.2-6. As noted in the table, LZ construction emissions would be short-term, would be completed prior to initiation of aircraft operations on the LZ, would not exceed *de minimis* thresholds, and would not be regionally significant. As a result, only recurring aircraft operations emissions after LZ construction is completed are considered for comparison with *de minimis* thresholds and determination of regional significance. The net change in total direct and indirect emissions for CO, VOC, and NO_X from recurring aircraft operations (*i.e.*, 12, 2, and 124 tpy, respectively) would be less than 10 percent of the emissions inventory, and the action would not be considered regionally significant. While the additional direct and indirect CO and VOC emissions would be below the *de minimis* thresholds established for these pollutants (*i.e.*, 100 tpy), the increase in direct and indirect NO_X emissions exceeds the *de minimis* threshold established for this pollutant (*i.e.*, 100 tpy).

Operation of a permanent LZ in the western United States would complete the west coast C-17 basing action initiated in 2003. Table 4.2-7 lists the emissions from recurring aircraft operations for the completed C-17 basing action at Travis AFB (*i.e.*, basing action emissions plus LZ operations emissions) and compares the combined emissions with the USEPA-approved 2006 SIP budget emissions for Travis AFB.



Travis AFB
LEGEND

CZ	Clear Zone		Runway
APZ	Accident Potential Zone		Roadway
			City Limits
			Travis AFB

Note:
Locations of imaginary surfaces for LZ are approximate.

N

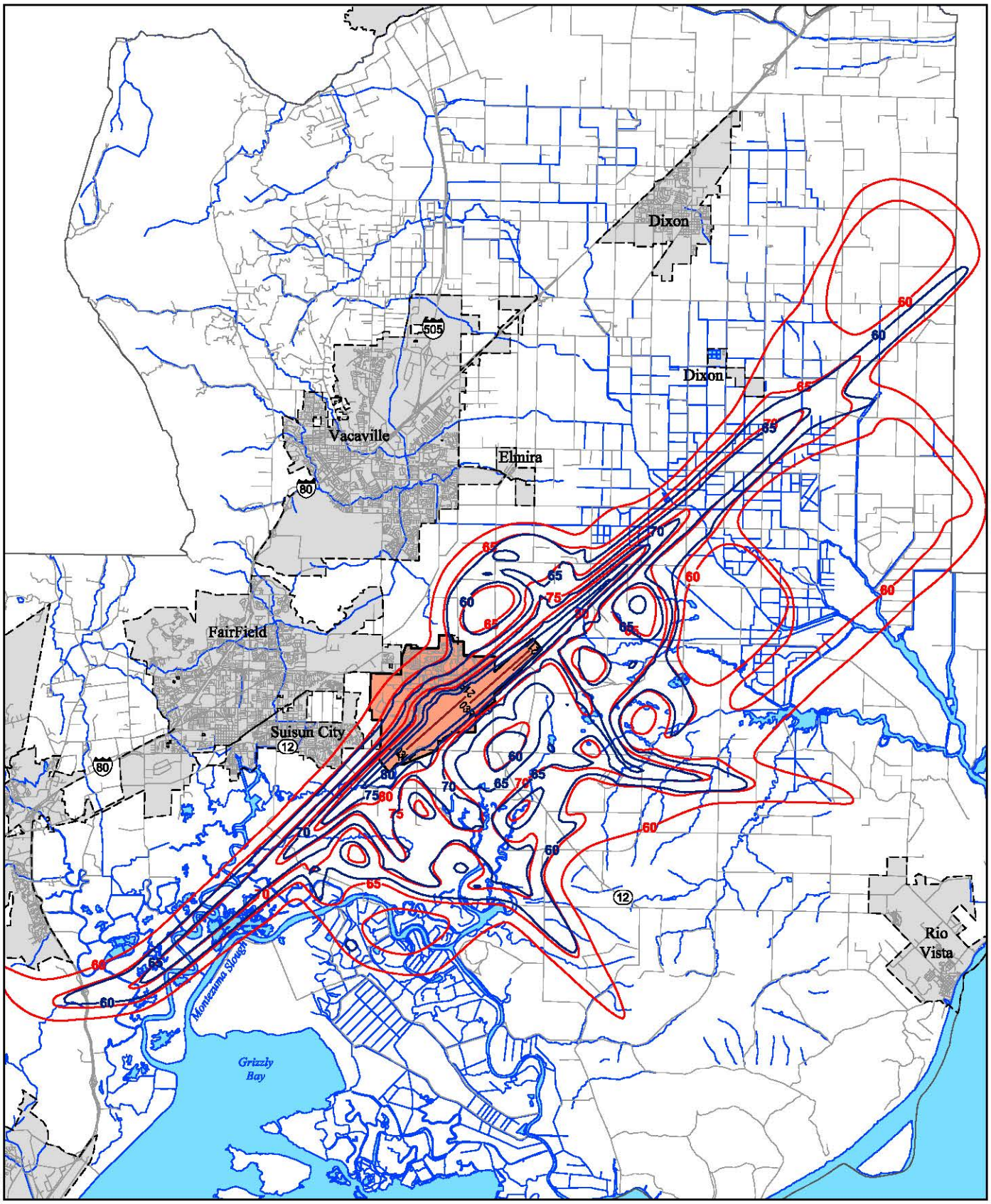
0 6,000
Feet

Travis AFB Landing Zone Imaginary Surfaces

Figure 4-6

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Travis AFB

LEGEND

- Land Use Compatibility Plan Noise Contours
- Proposed Action at Travis AFB Noise Contours
- Runway
- Roadway
- City Limits
- Travis AFB

N

0 19,000 Feet

Comparison of Land Use Compatibility Plan and Proposed Action at Travis AFB Noise Contours

Figure 4-7

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Table 4.2-6 Proposed Action at Travis AFB Regional Significance Analysis and Comparison to Conformity *de minimis* Thresholds in AQCR 30

Category	Pollutants Emitted (tons/year)					
	CO	**VOC**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Emissions Inventory	807,636	141,109	199,619	19,710	77,928	33,033
Short Term Construction Emissions						
Net Change in Short Term Emissions from Proposed Action Construction at Travis AFB	**+56**	**+4**	**+21**	+2	+13	+3
Net Change in Short-Term Emissions as Percent of Inventory	**0.007%**	**0.003%**	**0.011%**	0.010%	0.017%	0.009%
de minimis Threshold	**100**	**100**	**100**	NA	NA	NA
Net Change in Short-Term Emissions Exceed *de minimis?*	**No**	**No**	**No**	NA	NA	NA
Net Change in Short-Term Emissions Regionally Significant? (>10%)	**No**	**No**	**No**	NA	NA	NA
Long Term Emissions from Recurring Aircraft Operations						
Net change in Emissions from Proposed Action Recurring Aircraft Operations at Travis AFB	**+12**	**+2**	**+124**	+6	+26	+26
Emissions from Baseline Aircraft Operations	**384**	**175**	**1,378**	59	104	103
Total Emissions from Recurring Aircraft Operations	**396**	**177**	**1,502**	75	130	129
Net Change in Emissions from Recurring Aircraft Operations as Percent of Inventory	**0.001%**	**0.001%**	**0.062%**	0.031%	0.040%	0.079%

Table 4.2-6 Proposed Action at Travis AFB Regional Significance Analysis and Comparison to Conformity *de minimis* Thresholds in AQCR 30 (*continued*)

Category	Pollutants Emitted (tons/year)					
	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Total Emissions from Recurring Aircraft Operations as Percent of Inventory	**0.049%**	**0.125%**	**0.752%**	0.381%	0.167%	0.391%
de minimis Threshold	**100**	100	100	NA	NA	NA
Net Change in Emissions from Recurring Aircraft Operations Exceed *de minimis*?	**No**	**No**	**Yes**	NA	NA	NA
Net Change in Emissions from Recurring Aircraft Operations Regionally Significant? (>10%)	**No**	**No**	**No**	NA	NA	NA

NA – Not Applicable. De minimis does not apply since AQCR is in attainment for pollutant.
***Bold** indicates pollutants of concern for Travis AFB.*

Source: USAF 2007.

Table 4.2-7 Comparison of Recurring Aircraft Emissions for Proposed Action at Travis AFB to Travis AFB SIP Budget Emissions Levels

	CO (tpy)	VOC (tpy)	NO_X (tpy)
Emissions from Basing Action Recurring Aircraft Operations	384	175	1,378
Emissions from Recurring LZ Operations	12	2	124
Combined Recurring Aircraft Operations Emissions	396	177	1,502
SIP Budget Emissions	4,216	2,383	1,734
Comparison of Combined Recurring Aircraft Emissions to SIP Budget	-3,820	-2,206	-232

Note: Negative numbers indicate a surplus when compared to SIP budget

Although the NO_X emissions from recurring LZ aircraft operations exceed the *de minimis* threshold (see Table 4.2-6), the NO_X emissions from recurring aircraft operations for the completed C-17 basing action at Travis AFB (*i.e.*, basing action emissions plus LZ operations emissions) will not exceed the NO_X emissions in the USEPA-approved SIP budget for the base (see Table 4.2-7) .

Based on the information in the preceding paragraph and Table 4.2-7, it is determined that the Proposed Action at Travis AFB positively conforms to the SIP for the

base. The Air Force is supporting an activity demonstrated by USEPA standards not to cause or contribute to new violations of any NAAQS in the affected area, nor increase the frequency or severity of an existing violation. Implementation of the federal action would not delay timely attainment of pollutant standards in any area of the AQCR, and the action would be in compliance or would be consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of a positive General Conformity determination for the Proposed Action at Travis AFB fulfills the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B. A Conformity Determination would not be required.

4.2.4.2 Grant County Airport

Table 4.2-8 shows the emissions that would occur from the Proposed Action aircraft operations that would be accomplished at the Grant County Airport, the resultant total emissions for all aircraft operations at the airport, and compares the emissions (*i.e.*, net change and total emissions) with the baseline AQCR emissions inventory. No construction would occur; therefore, emissions would occur only from recurring aircraft operations. The methods used to calculate and analyze aircraft operations emissions for the Proposed Action at Travis AFB were used for the Proposed Action at the Grant County Airport.

Table 4.2-8 Emissions from Proposed Action at Grant County Airport and Comparison to Conformity Significance and *de minimis* Thresholds

	Criteria Air Pollutant (tpy)					
	CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Emissions Inventory	394,296	69,253	56,620	9,077	**134,609**	38,987
Net Change in Emissions from Proposed Action Recurring Aircraft Operations at the Grant County Airport	0	0	+6	0	**+1**	+1
Emissions from Baseline Aircraft Operations	543	213	652	36	**125**	124
Total Emissions from Recurring Aircraft Operations	543	213	658	36	**126**	125
Net Change in Emissions from Recurring Aircraft Operations as Percent of Inventory	0.000%	0.000%	0.011%	0.000%	**0.001%**	0.003%
Total Emissions from Recurring Aircraft Operations as Percent of Inventory	0.138%	0.308%	1.162%	0.379%	**0.094%**	0.321%
de minimis Threshold	NA	NA	NA	NA	**100**	100
Net Change in Emissions from Recurring Aircraft Operations Exceed *de minimis* Threshold?	NA	NA	NA	NA	**No**	No
Net Change in Emissions from Recurring Aircraft Operations Regionally Significant? (>10%)	No	No	No	No	**No**	No

NA – Not Applicable. De minimis does not apply since AQCR is in attainment for pollutant.
***Bold** indicates pollutants of concern.*

The total direct and indirect PM_{10} emissions from the recurring Proposed Action aircraft operations at the Grant County Airport (*i.e*., the net change in emissions, which would be 1 tpy), would be below the *de minimis* threshold established for this pollutant within AQCR 62. As summarized in Table 4.2-8, the net change in emissions for the pollutant of concern (*i.e*., PM_{10}), would not be regionally significant. A federal action would be considered regionally significant when the total emissions from the proposed action equal or exceed 10 percent of the nonattainment or maintenance area's emissions inventory for any criteria pollutant. The AQCR is in attainment for CO, NO_X, VOC, SO_x, and $PM_{2.5}$. As summarized in Table 4.2-8, the emissions for these five pollutants would be less than 10 percent of the particular emissions inventory.

Based on the information in Table 4.2-8 and the preceding paragraph and as noted in the BAAQMD letter (see Appendix C), it is determined that the Proposed Action at the Grant County Airport positively conforms to the SIP for the AQCR. The Air Force is supporting an activity demonstrated by USEPA standards not to cause or contribute to new violations of any NAAQS in the affected area, nor increase the frequency or severity of an existing violation. Implementation of the federal action would not delay timely attainment of pollutant standards in any area of the AQCR, and the action would be in compliance or would be consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of a positive General Conformity determination for the Proposed Action at the Grant County Airport fulfills the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B. A General Conformity Determination would not be required.

4.2.4.3 Mitigation

There would be no significant impacts. No mitigation is recommended.

4.2.4.4 Cumulative Impacts

Numerous construction projects would occur under other actions announced for Travis AFB. The methods for calculating emissions for the Proposed Action at Travis AFB were used to estimate cumulative emissions. Table 4.2-9 summarizes the emissions from the combination of the other actions and the Proposed Action at Travis AFB and compares the emissions with the baseline AQCR emissions inventory.

Table 4.2-9 Proposed Action Cumulative Emissions at Travis AFB

Activity	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Emissions Inventory	807,636	141,109	199,619	19,710	77,928	33,033
Short Term Construction Emissions						
Other Action Emissions	**20**	**3**	**37**	4	18	3
Proposed Action Emissions	**56**	**4**	**21**	2	13	3
Total Construction Emissions	**76**	**7**	**58**	6	31	6
Net Change in Short Term Emissions as Percent of Inventory	**0.009%**	**0.005%**	**0.029%**	0.032%	0.040%	0.017%
de minimis Threshold	**100**	**100**	**100**	NA	NA	NA
Net Change in Short-Term Emissions Exceed *de minimis* Threshold?	**NA**	**No**	**No**	NA	NA	NA
Net Change in Short-Term Emissions Regionally Significant? (>10%)	**NA**	**No**	**No**	NA	NA	NA

NA – Not Applicable. De minimis does not apply since AQCR is in attainment for pollutant.
***Bold** indicates pollutants of concern for Travis AFB.*

The cumulative combined net change in total direct and indirect short term construction emissions for CO, VOC, and NO_X (*i.e.*, 76, 7, and 58 tpy, respectively) would be less than 10 percent of the emissions inventory, and the action would not be considered regionally significant. Additionally, the direct and indirect CO, NO_X, and VOC emissions would be below the *de minimis* thresholds established for these pollutants (*i.e.*, 100 tpy).

There would be no cumulative emissions from recurring aircraft operations because none of the other actions have aircraft operations and only the Proposed Action at Travis AFB has aircraft emissions. The analysis related to recurring aircraft operations for the Proposed Action at Travis AFB also applies. As discussed for the Proposed Action at Travis AFB, the emissions from recurring aircraft operations positively conform to the SIP budget for Travis AFB.

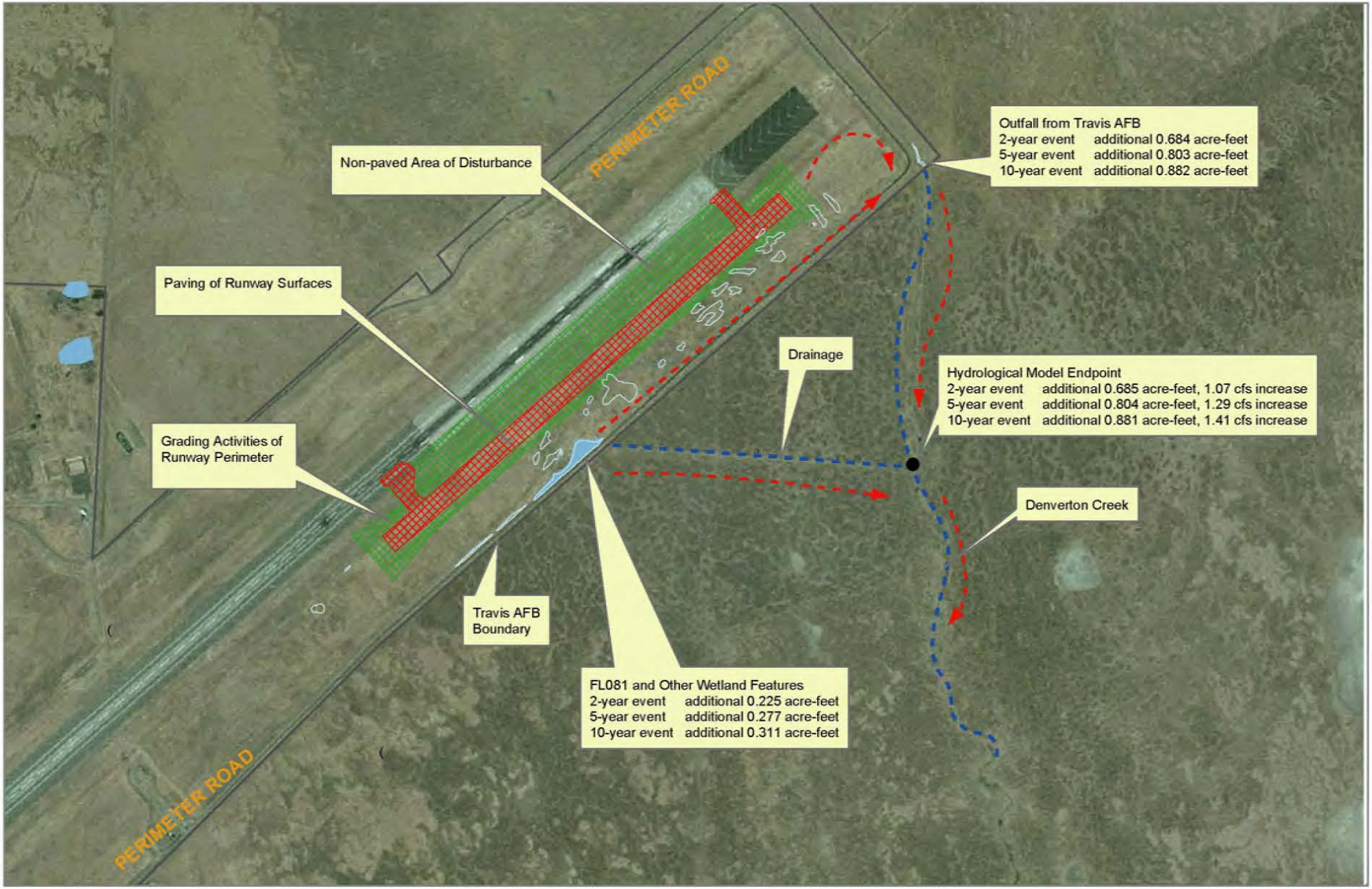
4.2.5 Biological Resources

Listed species and wetland features would be subject to direct effects associated with LZ construction activities and indirect hydrological effects associated with the addition of impervious surfaces. Direct effects include the removal of 35.1 acres of California tiger salamander upland habitat would be permanently removed by construction activities, which includes 9.6 acres of newly paved surfaces, 25.3 acres between Runway 03R-21L and the proposed C-17 runway, and the construction and use of a 0.11 acre access spur from Perimeter Road to the C-17 runway construction area. In addition to permanent losses of upland California tiger salamander habitat, 23.0 acres habitat would be temporarily lost due to grading activities on the proposed runway perimeter. These 23.0 acres are expected to return to suitable upland habitat conditions for the California tiger salamander within a few years. Effects on wetlands include the permanent removal of 0.42 acre of wetlands (0.18 acre of vernal pool habitat and 0.24 acre of seasonal

wetlands), and the temporary loss of 1.09 acres (0.64 acre of seasonal wetlands and 0.45 acre of drainage ditches).

In addition to the 1.51 acres of wetlands delineated subject to permanent and temporary removal, 2.59 acres of delineated wetland features on Base would be indirectly affected by the increased surface flows, as well as wetland features and drainages off Base. Modeling (completed as part of Section 7 Endangered Species Act [ESA] consultation with the U.S. Fish and Wildlife Service [USFWS] Sacramento Ecological Services Field Office) suggests that surface flow volumes would increase by 0.7 acre-feet (increase of 18 percent over existing conditions) for a two-year storm event, 0.8 acre-feet for a five-year event (increase of 16 percent), and 0.9 acre-feet for a 10-year event (increase of 15 percent). The on-Base flows would be channeled into a tributary of Denverton Creek, which would experience increased volumes, peak flow discharge, and peak velocities from storm events. A two-year storm event would contribute an additional 0.7 acre-feet into the Denverton Creek tributary (7.5 percent increase over existing conditions), peak flow would increase by 1.07 cubic feet per second (cfs) (8.7 percent increase), and peak velocity would increase by 0.06 feet per second (ft/sec) (7.7 percent increase). A five-year storm event would contribute an additional 0.8 acre-feet of runoff into the Denverton Creek tributary (6.0 percent increase), peak flow would increase by 1.29 cfs (7.3 percent increase), and peak velocity would increase by 0.05 ft/sec (5.6 percent increase). A 10-year storm event would contribute an additional 0.9 acre-feet of runoff into the Denverton Creek tributary (5.3 percent increase), peak flow would increase by 1.41 cfs (6.5 percent increase), and peak velocity would increase by 0.05 ft/sec (5.3 percent increase). The direct removal of California tiger salamander upland habitat may adversely affect this species, and the indirect effects associated with the altered hydrological regime would not be expected to adversely affect various special status invertebrate species. .

Table 4.2-10 summarizes the overland flow increases for on- and off-Base portions of the action area determined by the hydraulic model conducted for the BA prepared for the Proposed Action at Travis AFB (see Appendix D). Catchment areas (B-1 and B-2), as well as modeling locations are shown on Figure 4-8.



Permanent Direct Effects - 24.7 acres

Temporary Direct Effects - 29.7 acres

Ephemeral wetlands extents (CH2MHill 2001)

Medium CTS breeding potential seasonal wetlands with label (Jennings 2005)

Direction of flow

Sources:
(1) National Agricultural Imagery Program (NAIP) 2004 mosaic image of Solano County.
(2) Hydrological Analysis (included as Appendix B)

N

0 1,100 2,200 Feet

Direct and Indirect Effects to Biological Resources, Proposed Action

Figure 4-8

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Table 4.2-10 Contributions of Flows due to the Proposed Action Off-Base, Travis AFB

Modeled Storm Event[1]	On-Base			Off-Base		
	B-1	B-2	B Outfall	D1400		
	Volume (acre-feet)			Volume (acre-feet)	Peak Flow (cfs)	Peak Velocity (ft/sec)
Existing Conditions						
2 year	0.701	2.055	3.771	9.185	12.24	0.78
5 year	1.026	2.659	5.045	13.364	17.72	0.90
10 year	1.27	3.089	5.968	16.514	21.86	0.95
Proposed Action						
2 year	0.926	2.513	4.455	9.87	13.31	0.84
5 year	1.303	3.185	5.848	14.168	19.01	0.95
10 year	1.581	3.659	6.85	17.395	23.27	1.00
Difference						
2 year	0.225	0.458	0.684	0.685	1.07	0.06
5 year	0.277	0.526	0.803	0.804	1.29	0.05
10 year	0.311	0.57	0.882	0.881	1.41	0.05
Marginal Change						
2 year	32.1%	22.3%	18.1%	7.5%	8.7%	7.7%
5 year	27.0%	19.8%	15.9%	6.0%	7.3%	5.6%
10 year	24.5%	18.5%	14.8%	5.3%	6.5%	5.3%

Down-gradient portions of the Wilcox Ranch would be potentially affected by the indirect effects of additional paved surfaces. The modeling results show that runoff volumes and peak flows would increase at Denverton Creek with the addition of the LZ. Increases in storm water volume, discharge, and flow velocity may increase scouring potential along drainage features, resulting in a potential increase in sediment in downstream vernal pools. Higher amounts of storm water pollutants have been known to be associated with sediments from urban areas than from rural areas (Sartor and Boyd 1972). As such, pollutants from the LZ may become attached to storm water sediments and flow off-Base during storm events and into Denverton Creek. The storm water flows from the LZ site would combine with storm water originating from other areas, which include agricultural areas. Once in the creek, these flows may come into contact with vernal pool habitat and may pose a risk to species.

Increases in discharge, flow velocity, and flow volume may increase the contribution of pollutants associated with runway operation. Pollutants of concern from aircraft operations include chemicals used in de-icing operations in the aircraft parking areas on the west side of the airfield and rubber deposited on the LZ from aircraft landing gear tires. De-icing solution is 20 percent ethylene glycol and 80 percent water (International Union of Pure and Applied Chemists [IUPAC] 2007). The aircraft is sprayed with the product and the over spray is cleaned up using a floor scrubber vehicle. This waste is transferred from the vehicle into drums and picked up by a waste

contractor. Most de-icing operations occur in the aircraft parking area (see Figure 2.1 in Appendix D) and away from storm drains (Pontemayor 2007).

The build up of rubber can reduce the friction coefficient, causing aircraft tires to slip on the runway when landing and increasing the potential for an aircraft to slide off the runway (Speidel 2002). Residue in rubber materials is considered pollutants, and may accumulate. Rubber removal techniques include high pressure water removal, water-soluble non-toxic chemical removal, or high velocity particle blasting, and are described in the BA (see Attachment C of Appendix D). When considering damage to the runway and environmental issues, the preferred method of removal would be high pressure water blasting, ultra high pressure water blasting, or high velocity impact removal (shotblasting). By increasing the hydroperiod and by contributing more overland flow into the hydrological system, hydroperiods may increase in length. The additional flow contributions would be expected to lengthen the hydroperiod of vernal pools off-Base where Denverton Creek diffuses, affecting the life-cycle completion of T&E vernal pool species. Beneficial effects of an increased hydroperiod may be expected when wet seasons with low precipitation amounts fail to support adequate hydroperiods for the completion of species life cycles. Non-beneficial effects of an increased hydroperiod would be expected in vernal pools with normally shortened hydroperiods that experience a sudden and/or prolonged contribution of surface water. Increasing the hydroperiod in these more "flashy" vernal pools may create conditions more conducive to predatory fish, such as the stickleback. An increased volume and duration of surface flows will increase back-up of water, thereby increasing the duration of hydrologic connectivity between isolated vernal pools. This could increase the likelihood of predatory fish invasions.

The resulting flow velocity in the creek is less than 1 foot per second (ft/sec) for storm events with less than a 10-year return period (see Table 4.2-10). Velocities in this range could cause erosion dependent on the sediment particle sizes and compaction. Most particles (larger than 0.001 mm) that are fairly compact (ratio of void volume to solids volume less than 8) will have a strong erosion resistance to flows with velocities less than 1 ft/sec (Collinson and Thompson 1989). Storms with a shorter duration period will result in lower flow velocities and, therefore, less erosion. Even though erosion may be a concern, the velocity increase resulting from the Proposed Action is less than 0.06 ft/sec when compared to pre-construction velocity (see Table 4.2-10).

Construction contractors would ensure a SWPPP is completed and approved before initiating activities. The SWPPP would conform to regional requirements for projects adjacent to vernal pool areas and likely would include erosion control techniques that would be used during demolition and construction to minimize erosion. Erosion control techniques would include construction of silt fences and other erosion control features such as absorbent booms to prevent silt, oil, and grease flow down gradient. The rate of runoff from the construction site would be retarded and controlled mechanically.

With the implementation of the SWPPP and other protective/mitigative measures developed in the Section 7 ESA consultation process, the Proposed Action would not significantly impact biological resources. The Air Force and USFWS are jointly

developing protective measures that will offset any significant impacts that arise from adverse effect to special status species.

4.2.5.1 Mitigation

The Air Force completed Section 7 ESA formal consultation with the USFWS Sacramento Ecological Services Field Office for impacts of the proposed action on special status species and habitats. A BA was submitted to the USFWS on February 5, 2008, which concluded that the Proposed Action at Travis AFB would potentially adversely affect the California tiger salamander, not adversely affect special status invertebrate species, and not affect the Contra Costa goldfield. The BO prepared by the USFWS states the amount of compensation determined by the Air Force and USFWS necessary to offset the potential adverse effect on the California tiger salamander from the direct and indirect impacts of the Proposed Action at Travis AFB. The BO concluded that the Travis AFB C-17 LZ project, as proposed, is not likely to jeopardize the continued existence of the California tiger salamander. The BO also states that the proposed project is not located within designated critical habitat for the salamander; therefore, critical habitat for this species will not be affected. (Appendix D contains the BA and BO.) Subchapter 2.2.2.3 details the conservation and minimization measures associated with the Proposed Action.

4.2.5.2 Cumulative Impacts

Travis AFB has a managed landscape, and mowing, disking, building construction, and urban-like improvements would be expected to continue into the foreseeable future, with or without the Proposed Action. Natural species diversity and continuity and connectivity of habitats would be expected to decline over the long term. Some species would thrive while others would be displaced and exotic species would most likely continue to increase and displace native species and communities. Therefore, baseline conditions under the No Action Alternative would represent an environment unfavorable to the recovery and health of native aquatic habitats and the species supported by these habitats. Cumulative biological resources impacts would not be considered significant.

4.2.6 Cultural Resources

4.2.6.1 Travis AFB

The Proposed Action at Travis AFB includes construction of a permanent LZ adjacent to the existing runway in areas previously disturbed by construction activities, and does not involve any demolition or alteration of buildings or structures. No NRHP-eligible resources were identified in the ROI at Travis AFB. One Native American group responded to the notification letter and indicated the group was not aware of any "historic properties" on the project site (see Appendix E). The letter also provided individuals to contact if any new information or historic remains are found during the project. The Proposed Action at Travis AFB would have no effect on cultural resources.

4.2.6.2 Grant County Airport

The Proposed Action at the Grant County Airport would not involve any new construction or ground-disturbing activities, or demolition or alteration of buildings or structures. No NRHP-eligible resources were identified at the Grant County Airport. No Native American groups responded to the notification letter. The Proposed Action at the Grant County Airport would have no effect on cultural resources.

4.2.6.3 Mitigation

There would be no significant impacts. No mitigation is recommended.

4.2.6.4 Cumulative Impacts

The Proposed Action at Travis AFB is one of a number of other planned projects involving construction on the Base. The potential for cumulative impacts from the Proposed Action at Travis AFB and other actions is minimal based on the distance between project sites. The potential for cumulative impacts between the Proposed Action at Travis AFB and other projects would be prevented or minimized through implementation of the procedures identified in the Travis AFB ICRMP. When combining the other actions with implementation of the Proposed Action at Travis AFB, no cumulative adverse effects on significant cultural resources would occur.

4.3 SOUTHERN CALIFORNIA LOGISTICS AIRPORT ALTERNATIVE

A 3,500-foot long, 90-foot wide LZ with 300-foot long overruns at each end and connecting taxiways and would be constructed 700 feet west of the main instrument runway (Runway 17/35). Day/night LZ markings, and an IR lighting system for NVG operations would be installed. Additionally, Travis AFB aircrews would accomplish operations on an LZ that would be painted on Runway 21Left/03Right at Travis AFB and on the existing LZ at the Grant County Airport. Annually, approximately 4,279 C-17 (11.89 average daily) and 3,745 C-130 (10.40 average daily) operations would be accomplished at the SCLA LZ. Approximately 778 annual (2.16 average daily) C-17 operations would be accomplished on the LZ that would be established at Travis AFB. Approximately 3,501 annual (9.73 average daily) additional operations would be accomplished on the existing LZ at the Grant County Airport.

4.3.1 Aircraft Operations, Aircraft Safety, and Bird/Wildlife-Aircraft Strike Hazard

4.3.1.1 Southern California Logistics Airport

Aircraft Operations

Under the SCLA Alternative at the SCLA, average daily airfield operations at the airport would increase by 22.29 operations from 155.38 to 177.67 operations (compare Tables 2.2-2 and 2.2-6), an approximate 14 percent increase. Approximately 65,000

annual operations would occur under the SCLA Alternative. The anticipated annual operations would equate to approximately 25 percent of the airfield capacity, an increase of 3 percent. It is anticipated the LZ operations would be accomplished after 10:00 p.m. and that nearly all operations occur primarily between 6:00 a.m. and 2:00 a.m. Based on these hours of operation, there would be 20 hours of operations per day for hourly capacity purposes. Based on a 20-hour day, the average IFR hourly operations would be about nine operations, approximately 15 percent of the hourly capacity. There would be a decrease of about two hourly operations when comparing the baseline and the SCLA Alternative because of the increase from 15 to 20 hours per day of operation. The airfield has the capacity to accommodate the increase in operations.

Tactical C-17 maneuvers such as spiral up departures, spiral down arrivals, high-speed-low altitude arrivals and departures, steep straight-in arrivals, and steeper than normal climb out on departure would be added to the flight track inventory at the SCLA. The location for the tracks associated with these maneuvers would not be coincidental with existing tracks at the SCLA. Additionally, some of these tactical maneuvers would be initiated in High Desert TRACON airspace and transition to the SCLA air traffic control tower airspace, or vice versa. The two air traffic control agencies would develop and implement procedures to coordinate the transition of C-17s from one airspace unit to the other. The 700 feet between the LZ and Runway 17.35 would allow simultaneous VFR operations. Although there may be instances where both the C-17 and the other aircraft would need to adjust patterns, the volumes of traffic in the airspaces, in conjunction with the air traffic control procedures developed to accommodate the C-17 tactical maneuvers, would not impair operations at the SCLA.

Aircraft Safety

The additional C-17 operations at the SCLA would include tactical arrivals, departures, and closed patterns. Although these operations are not accomplished at the airport under the baseline, the Class A mishap rates for the C-17 and C-130 in Table 3.1-1 include the flying hours associated with all Air Force C-17 and C-130 operations, to include tactical events and operations at non-military airfields. Thus, the C-17 and C-130 operations at the airport would be consistent with the operations accounted for in the Air Force-wide C-17 and C-17 Class A mishap rates. For this reason, the risk is low that an aircraft involved in an accident at or around the SCLA would strike a person or structure on the ground.

Bird/Wildlife-Aircraft Strike Hazard

The background information in Subchapter 4.2.1 concerning the behavior factors of birds/wildlife and aircraft operational factors also applies to the alternative. Overall, aircraft operations at the SCLA would increase by about 14 percent. Thus, there would be potential for a corresponding increase in bird/wildlife-aircraft strikes at the SCLA. It is anticipated the altitude distribution of the additional strikes would follow the data in Table 3.1-2 because the types of operations by aircraft operating at the airfield would be consistent with the types of operations associated with data in the table. The discussion

and analysis concerning the number of bird/wildlife-aircraft strikes that result in serious mishap in Subchapter 4.2.1.1 also apply.

4.3.1.2 Travis AFB

Aircraft Operations

Under the SCLA Alternative at Travis AFB, average daily airfield operations at the Base would increase by 2.16 operations, from 221.81 to 223.97 (compare Tables 2.2-1 and 2.2-7), a 1 percent increase. Approximately 71,000 annual operations would occur under the SCLA Alternative at Travis AFB. The anticipated annual operations would equate to approximately 25 percent of the airfield capacity, or no change when compared to the baseline. Assuming nearly all operations occur primarily between 6:00 a.m. and 2:00 a.m., there would be 20 hours of operations per day for hourly capacity purposes. Based on a 20-hour day, the average IFR hourly operations would be about 11 operations, approximately 21 percent of the hourly capacity (no change from the baseline). The airfield has the capacity to accommodate the increase in operations.

Although new C-17 tactical departures, arrivals, and closed pattern events would be added to the flight track inventory for operations on the LZ, the track locations and aircraft profiles (*i.e.*, airspeed, altitude, and power settings) for the new tracks would be similar to those that occur under the baseline condition. The existing air traffic control procedures for the airspace surrounding the airfield and at the airfield would continue to accommodate the continued C-17 operations on Runways 21L/03R and 21R/03L as well as the existing and new aircraft ground tracks and increased operations on the LZ.

Aircraft Safety

It is impossible to predict the precise location where an aircraft involved in an in-flight accident would impact the ground. However, aircraft flight tracks are developed to avoid overflying residences and built-up areas to the maximum extent practicable. The types of landing and takeoff operations the C-17s would accomplish at Travis AFB would be consistent with those currently flown at the Base, and the C-17 Class A mishap rate listed in Table 3.1-1 also applies. For these reasons, the risk is low that an aircraft involved in an accident at or around the Travis AFB would strike a person or structure on the ground.

Bird/Wildlife-Aircraft Strike Hazard

The background information in Subchapter 4.2.1 concerning the behavior factors of birds/wildlife and aircraft operational factors also applies to the alternative. Overall, aircraft operations at Travis AFB would increase by about 1 percent. Thus, there would be potential for a corresponding increase in bird/wildlife-aircraft strikes at Travis AFB. It is anticipated the altitude distribution of the additional strikes would follow the data in Table 3.1-2 because the types of operations by aircraft operating at the airfield would be consistent with the types of operations associated with data in the table. The discussion

and analysis concerning the number of bird/wildlife-aircraft strikes that result in serious mishap in Subchapter 4.2.1.1 also apply.

4.3.1.3 Grant County Airport

Aircraft Operations

Under the SCLA Alternative at the Grant County Airport, average daily airfield operations at the airport would increase by 9.73 operations from 218.42 to 228.15 operations (compare Tables 2.2-3 and 2.2-8), an approximate 4 percent increase. Approximately 83,200 annual operations would occur under the SCLA Alternative at the Grant County Airport. The anticipated annual operations would equate to approximately 23 percent of the airfield capacity, an increase of 1 percent. Assuming nearly all operations would occur primarily between 6:00 a.m. and 2:00 a.m., there would be 20 hours of operations per day for hourly capacity purposes. Based on a 20-hour day, the average IFR hourly operations would be about 11 operations, approximately 19 percent of the hourly capacity (no change from the baseline). The airfield has the capacity to accommodate the increase in operations.

Aircrews from Travis AFB would schedule operations at the Grant County Airport through McChord AFB. This would ensure compliance with the McChord AFB-Grant County Airport agreement that states the maximum number of C-17s operating at the airport would not exceed two aircraft and would not operate between 2:00 a.m. and 7:00 a.m. (Ryan 2007).

As mentioned in Subchapter 3.3.1.1, C-17 aircraft accomplish operations on Runways 14R/32L and 04/22 and tactical training operations on the LZ (Runway 09/27) under the baseline condition. No new tactical departure, arrival, and closed pattern events would be added and Travis AFB aircrews would use the existing tracks for operations at the airfield. The existing air traffic control procedures for the airspace surrounding the airfield and at the airfield would accommodate the proposed C-17 operations at the airfield.

Aircraft Safety

It is impossible to predict the precise location where an aircraft involved in an in-flight accident would impact the ground. However, aircraft flight tracks are developed to avoid overflying residences and built-up areas to the maximum extent practicable. The types of landing and takeoff operations the C-17s would accomplish at the Grant County Airport would be consistent with those currently flown at the airport, and the C-17 Class A mishap rate listed in Table 3.2-1 also applies because the data include operations at non-military airfields. For these reasons, the risk is low that an aircraft involved in an accident at or around the Grant County Airport would strike a person or structure on the ground.

Bird/Wildlife-Aircraft Strike Hazard

The background information in Subchapter 4.2.1.1 concerning the behavior factors of birds/wildlife and aircraft operational factors also applies to the alternative. Overall, aircraft operations at the Grant County Airport would increase by about 4 percent. Thus, there would be potential for a corresponding increase in bird/wildlife-aircraft strikes at the airport. It is anticipated the altitude distribution of the additional strikes would follow the data in Table 3.1-2 because the types of operations by aircraft operating at the airfield would be consistent with the types of operations associated with data in the table. The discussion and analysis concerning the number of bird/wildlife-aircraft strikes that result in serious mishap in Subchapter 4.2.1.1 also apply.

4.3.1.4 Mitigation

There would be no significant impacts. No mitigation is recommended.

4.3.1.5 Cumulative Impacts

None of the other actions at the SCLA or Travis AFB include aircraft operations. Therefore, there would be no cumulative aircraft operations, aircraft safety, or bird/wildlife-aircraft strike impacts at either installation.

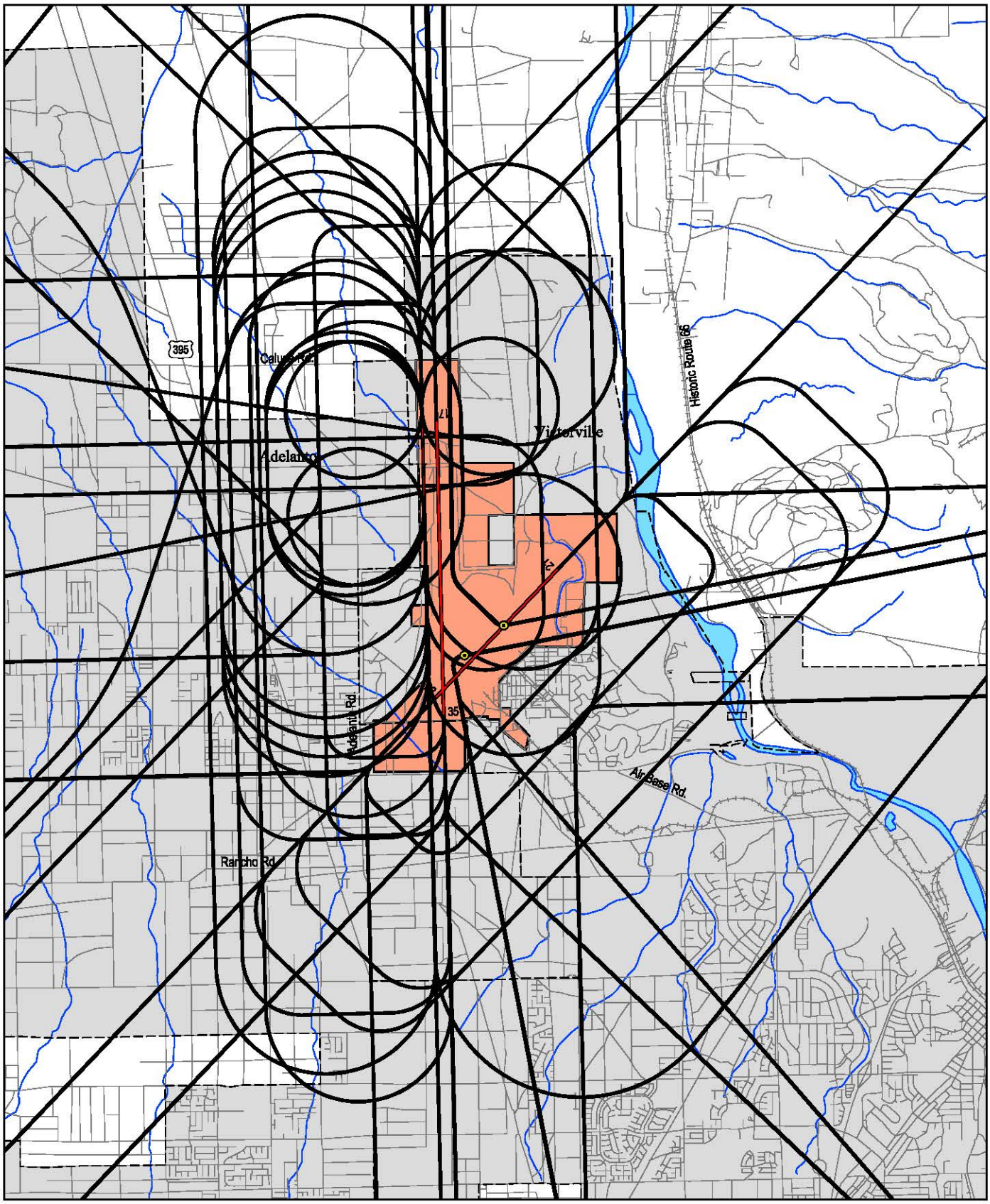
4.3.2 Noise

4.3.2.1 Southern California Logistics Airport

Noise associated with the SCLA Alternative at the SCLA would be generated by aircraft operations and construction activities.

Aircraft Noise

Figure 4-9 shows the aircraft ground tracks, and Figure 4-10 depicts the noise exposure area at the Southern California Logistics Airport after the LZ would be constructed and aircraft operations occur at the projected levels. Figure 4-11 compares the SCLA Alternative at the SCLA and the No Action Alternative noise contours. The aircraft operations modeled include the average busy day aircraft operations for the SCLA Alternative at the SCLA (see Table 2.2-6).

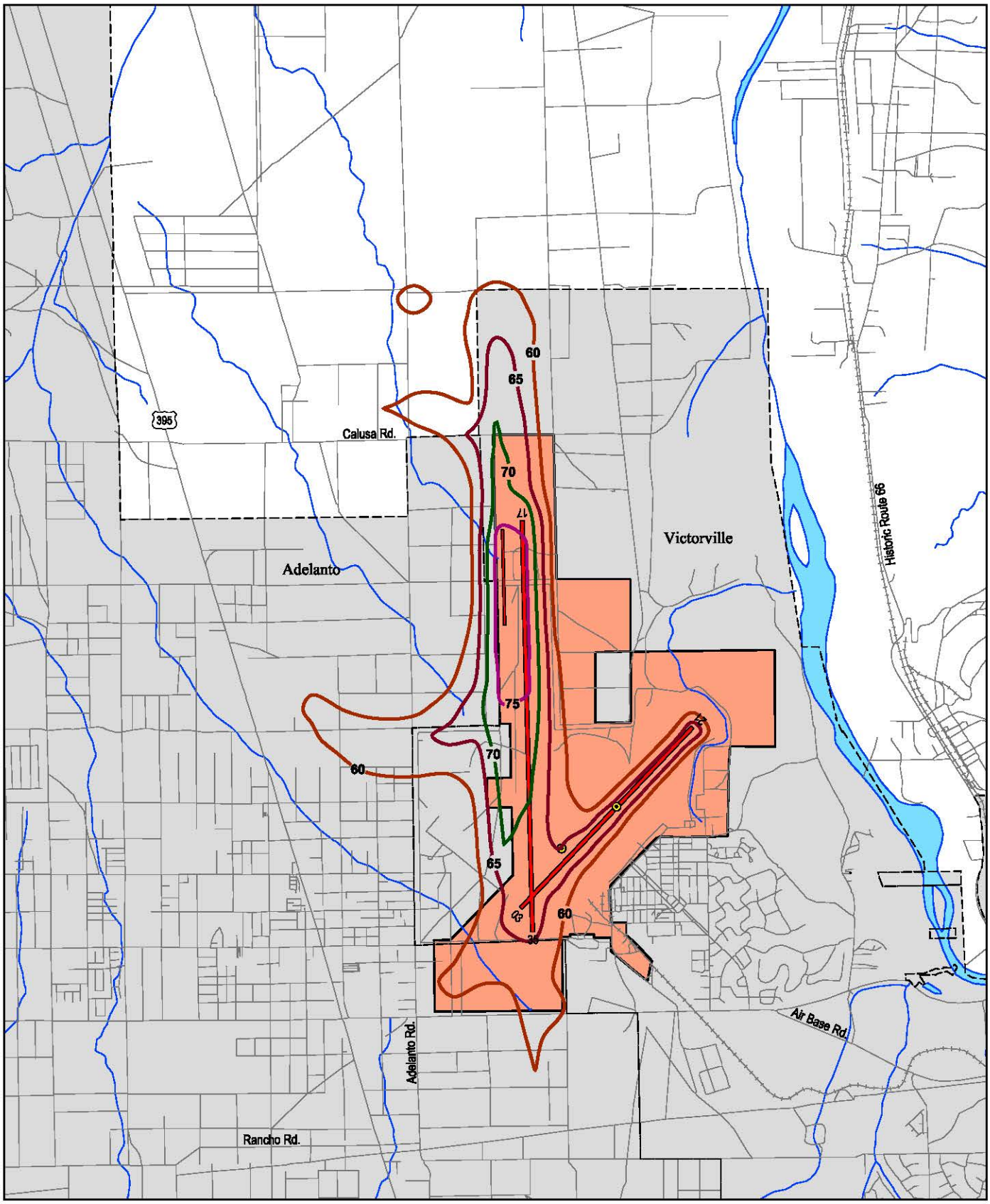


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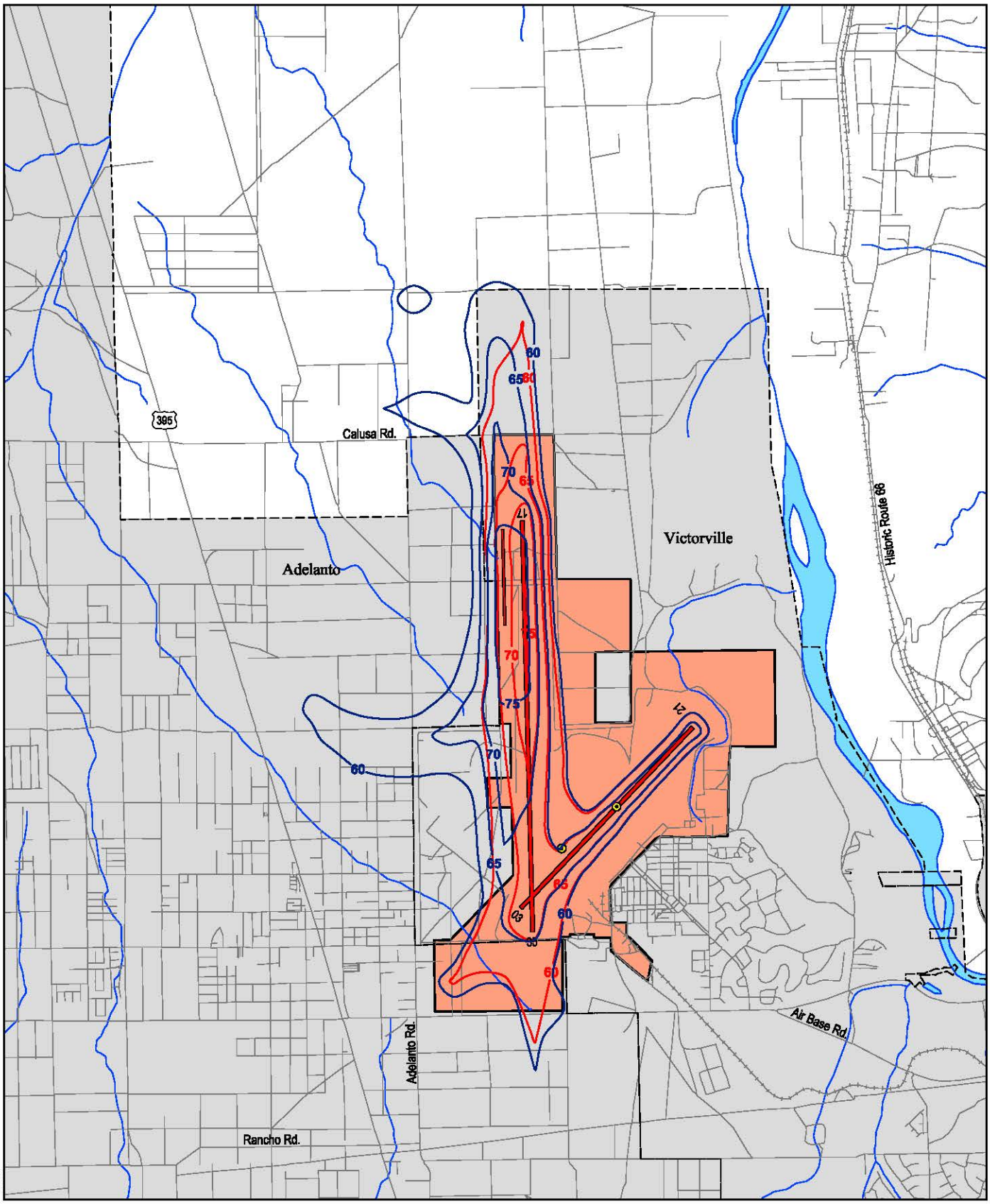
Southern California Logistics Airport Alternative Aircraft Ground Tracks at Southern California Logistics Airport

Figure 4-9

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Southern California Logistics Airport
LEGEND
CNEL 60 dB Contour
CNEL 65 dB Contour
CNEL 70 dB Contour
CNEL 75 dB Contour
CNEL 80 dB Contour
Runway
Roadway
City Limits
Drop Zone
Southern California Logistics Airport
N
0
5,000
Feet
Southern California Logistics Airport Alternative Noise Contours at Southern California Logistics Airport
Figure 4-10
744211 WCLZ-SCL-APNC.DWG
395
Calusa Rd.
Adelanto
Victorville
Historic Route 66
Air Base Rd.
Adelanto Rd.
Rancho Rd.
60
65
70
75
17
35

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Comparison of No Action and Alternative and Southern California Logistics Airport Alternative Noise Contours at Southern California Logistics Airport

Figure 4-11

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Single Event Noise Analysis

Each aircraft overflight yields a single-event noise level, presented as SEL. C-17 and C-130 aircraft would accomplish operations on the LZ after it is constructed. Thus, the SCLA and surrounding areas would be exposed to SELs from C-17s and C-130s at the levels listed in Table 3.2-2. The greatest SEL values for aircraft based at the SCLA would continue to be 115 dBA, which is produced by the B-727 aircraft (see Table 3.2-2) that, respectively, is 2 and 5 dBA louder than the C-17 and C-130 at distances of 200 feet from the aircraft.

The induced hearing data in Table 4.2-1 and related discussion in Subchapter 4.2.2 for the Proposed Action at Travis AFB also apply. Based on the level of noise exposure from the SCLA Alternative at the SCLA, it is doubtful an individual would be exposed to noise that would produce hearing loss.

Nearby schools would continue to be exposed to noise from aircraft operations. Assuming schools conduct teaching for an approximate 8-hour period (8:00 a.m. through 4:00 p.m.), about 40 percent of the 20-hour flying day would occur when classroom activities occur. Thus, approximately 40 percent (*i.e.*, 8.9 operations) of the combined additional 22.29 average daily operations (*i.e.*, 11.89 C-17 and 10.40 C-130) would occur during school time. Based on an 8-hour school day and 8.9 operations, there would be an average of about 1.1 additional overflight per hour that could interfere with classroom activities in schools that would be overflown.

Based on FICAN recommendations, outdoor SELs of 80 to 100 dBA (60 to 80 dBA indoors) could result in 4 to 10 percent awakenings, respectively, in the exposed population. Over the course of sleeping, different individuals might be awakened by different events, and some individuals might be awakened more than once. Individuals in residences in the area around the airport would continue to be exposed to indoor SEL of 60 to 80 dBA during normal sleep periods (10:00 p.m. to 7:00 a.m.). There would be a combined total of three additional off-airport persons exposed to CNEL 60 dBA and greater as a result of the SCLA Alternative at the SCLA. Assuming the number of sleep awakenings would be proportional to the increase in exposed population and that 10 percent of the persons would be awakened, about one additional person potentially could be awakened when comparing the SCLA Alternative at the SCLA to the baseline condition. Those individuals who sleep between 7:00 a.m. and 10:00 p.m. likely would be affected just as those persons who sleep during normal nighttime sleep periods.

Averaged Noise Analysis

Table 4.3-1 compares the SCLA Alternative at the SCLA with the No Action Alternative (*i.e.*, baseline) for the following: off-airport land area and population exposed to noise of CNEL 60 dBA and greater; and the population potentially highly annoyed.

Table 4.3-1 Summary of Off-Airport Land Area and Population Exposed to, and Population Potentially Highly Annoyed by DNL 65 dBA and Greater, Southern California Logistics Airport Alternative at the SCLA

		CNEL Interval (dBA)				
Category	**60-65**	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres						
No Action Alternative	284	11	0	0	0	295
SCLA Alternative at the SCLA	764	280	105	8	0	1,157
Change	+480	+269	+105	+8	0	+862
Percent Change	+169%	+2,445%	--	--	0%	+292%
Population						
No Action Alternative	0	0	0	0	0	0
SCLA Alternative at the SCLA	2	1	0	0	0	3
Change	+2	+1	0	0	0	+3
Percent Change	--	--	--	--	0.0%	--
Population Potentially Highly Annoyed						
No Action Alternative	0	0	0	0	0	0
SCLA Alternative at the SCLA	0	0	0	0	0	0
Change	0	0	0	0	0	0
Percent Change	--	--	--	--	--	--

Note: The No Action Alternative also is the baseline. Acres reflect only off-Base land area. People highly annoyed determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1-4.

The SCLA Alternative at the SCLA CNEL 60 dBA and greater noise contours along and east of Runway 17/35 would be similar to the No Action Alternative (see Figure 4-11). However, an additional 862 acres would be exposed to CNEL 60 dBA and greater, with the increases occurring to the north, west, and south of the airfield. The reason for the increased noise exposure is the addition of LZ-related C-17 aircraft flight tracks that overfly the areas, especially to the west.

People would be exposed to aircraft noise in two of the five noise zones (see Table 4.3-1), with the CNEL 60-65 dBA noise zone containing two of the three persons exposed to CNEL 60-dBA and greater. These three persons would equate to less than 1 percent of the estimated 12,436 persons (based on 2000 census data) who live within the approximate 5-mile radius area associated with airfield airspace environment, a minimal change when compared to the No Action Alternative (*i.e.*, baseline). The overall number of persons who could be potentially highly annoyed by noise exposure would be would continue to be zero.

The data in Table 4.2-3 and related discussion and analysis for the contribution of outdoor noise to indoor noise for the Proposed Action at Travis AFB in Subchapter 4.2.2 also apply. Based on the SCLA's location, the warm climate data would apply to buildings on and in the area surrounding the airport. The discussion and analysis for nonauditory health effects the Proposed Action at Travis AFB in Subchapter 4.2.2 also apply.

Effects of Noise on Structures

As discussed in Subchapter 3.1.2.2, L_{max} is used to determine the potential effects to structures from sound. The L_{max} is the highest instantaneous sound pressure during a single noise event, no matter how long the sound may persist. No damage would occur to structures in the area surrounding the SCLA from C-17 and C-130 LZ operations because the L_{max} produced by the aircraft (*i.e.*, 113 and 100 dBA at 200 feet from the aircraft) would not exceed the level at which structural damage could occur.

Construction Noise

The SCLA Alternative and Proposed Action at Travis AFB construction site locations are identical when considering location of the site on the airfield, the proximity to the airfield boundary, and distance to other action construction. Based on the similarities, the construction noise discussion and analysis for the Proposed Action at Travis AFB in Subchapter 4.2.2 also apply. The SCLA Alternative at the SCLA construction noise would be temporary and occur only during the hours that construction and demolition activity would occur and would cease when the project is completed. Sleep interference is unlikely because construction and demolition activities would occur during daytime. Speech disruption would be temporary, lasting only as long as the noise-producing event.

4.3.2.2 Travis AFB

Noise associated with the SCLA Alternative at Travis AFB would be generated by aircraft operations. Figure 4-12 depicts aircraft ground tracks for the SCLA Alternative Travis AFB. Figure 4-13 depicts the noise exposure area at the airport under the SCLA Alternative at Travis AFB. Figure 4-14 compares the SCLA Alternative at Travis AFB and the No Action Alternative noise contours. The aircraft operations modeled include the average busy day aircraft operations for the SCLA Alternative at Travis AFB (see Table 2.2-7).

Single Event Noise Analysis

Each aircraft overflight yields a single-event noise level, presented as SEL. C-17 and C-130 aircraft, which currently operate at Travis AFB, would also accomplish operations on the LZ after it is constructed. Thus, Travis AFB and surrounding areas would continue to be exposed to SELs from C-17s at the levels listed in Table 3.2-2. The greatest SEL values for the aircraft based at Travis AFB would continue to be produced the C-5 aircraft, which is 12 dBA louder than the C-17 aircraft.

The induced hearing data in Table 4.2-1 and related discussion in Subchapter 4.2.2 for the Proposed Action at Travis AFB also apply. Based on the level of noise exposure from the SCLA Alternative at Travis AFB aircraft operations in areas where people live, it is doubtful that an individual would be exposed to noise that would produce hearing loss.

Nearby schools would continue to be exposed to noise from aircraft operations. Assuming schools conduct teaching for an approximate 8-hour period (8:00 a.m. through 4:00 p.m.), about 40 percent of the 20-hour flying day would occur when classroom activities occur. Thus, approximately 40 percent of the additional 2.16 average daily C-17 operations (*i.e.*, 0.9 operations) would occur during school time. Based on an 8-hour school day and 0.9 operations, there would be an average of less than one additional overflight per hour that could interfere with classroom activities in schools that would be overflown.

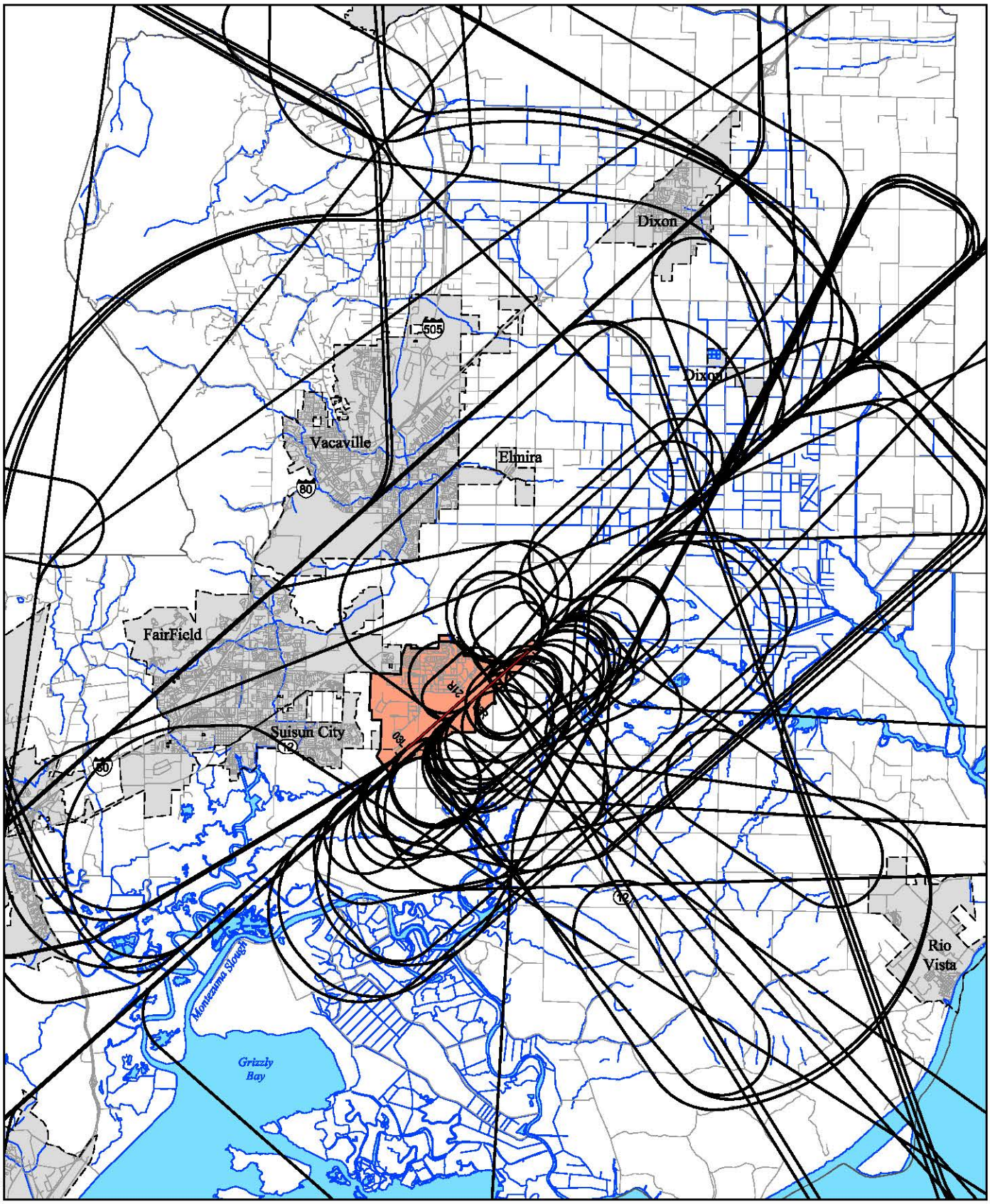
Based on FICAN recommendations, outdoor SELs of 80 to 100 dBA (60 to 80 dBA indoors) could result in 4 to 10 percent awakenings, respectively, in the exposed population. Over the course of sleeping, different individuals might be awakened by different events, and some individuals might be awakened more than once. Individuals in residences in the area around the Base would continue to be exposed to indoor SEL of 60 to 80 dBA during normal sleep periods (10:00 p.m. to 7:00 a.m.). There would be a combined total of six additional off-Base persons exposed to CNEL 60 dBA and greater as a result of the SCLA Alternative at Travis AFB. Assuming the number of sleep awakenings would be proportional to the increase in exposed population and that 10 percent of the persons would be awakened, one additional person potentially could be awakened when comparing the SCLA Alternative at Travis AFB to the baseline condition. Those individuals who sleep between 7:00 a.m. and 10:00 p.m. likely would be affected just as those persons who sleep during normal nighttime sleep periods.

Averaged Noise Analysis

Table 4.3-2 compares the SCLA Alternative at Travis AFB with the No Action Alternative (*i.e.*, baseline) for the following: off-Base land area and population exposed to noise of CNEL 60 dBA and greater; and the population potentially highly annoyed.

Overall, the SCLA Alternative at Travis AFB noise contours would be nearly identical to the No Action Alternative (*i.e.*, baseline) contours (see Figure 4-14), with the number of off-Base acres in the CNEL 60 dBA and greater exposure area increasing by 1 percent.

People would continue to be exposed to aircraft noise in four of the five noise zones (see Table 4.3-2), with the CNEL 60-65 dBA noise zone containing 261 of the 381 persons exposed to CNEL 60-dBA and greater. These 381 persons would equate to about 1 percent of the estimated 64,492 persons (based on 2000 census data) who live within the approximate 5-mile radius area associated with airfield airspace environment, or no change when compared to the No Action Alternative (*i.e.*, baseline). The density of residences in the newly exposed area would be consistent with adjacent residential areas exposed to aircraft noise under the No Action Alternative (*i.e.*, baseline). The overall number of persons who could be potentially highly annoyed by noise exposure would be 61 people, or one additional person when compared to the No Action Alternative (baseline).

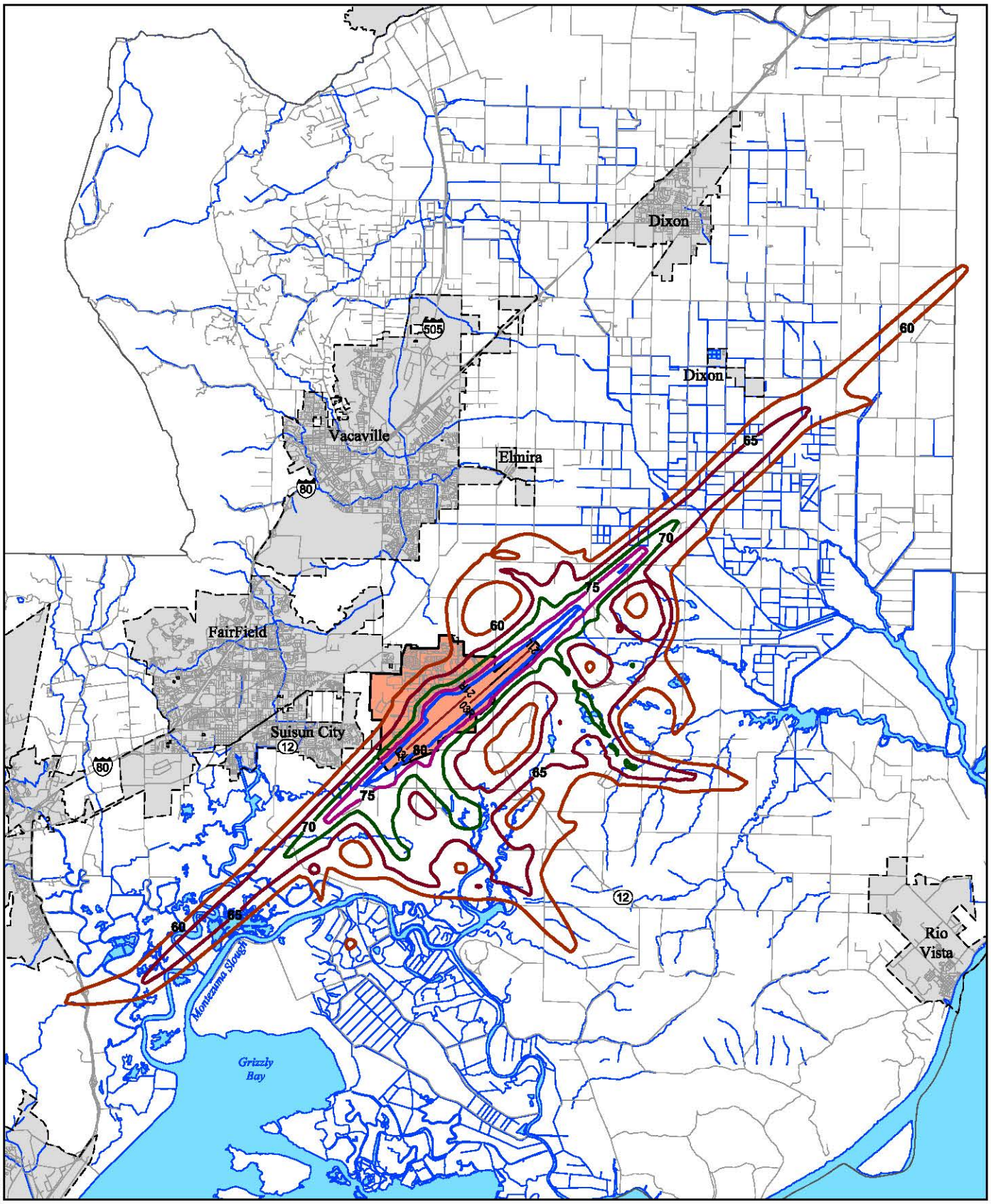


Southern California Logistics Airport Alternative Aircraft Ground Tracks at Travis AFB

Figure 4-12

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Travis AFB

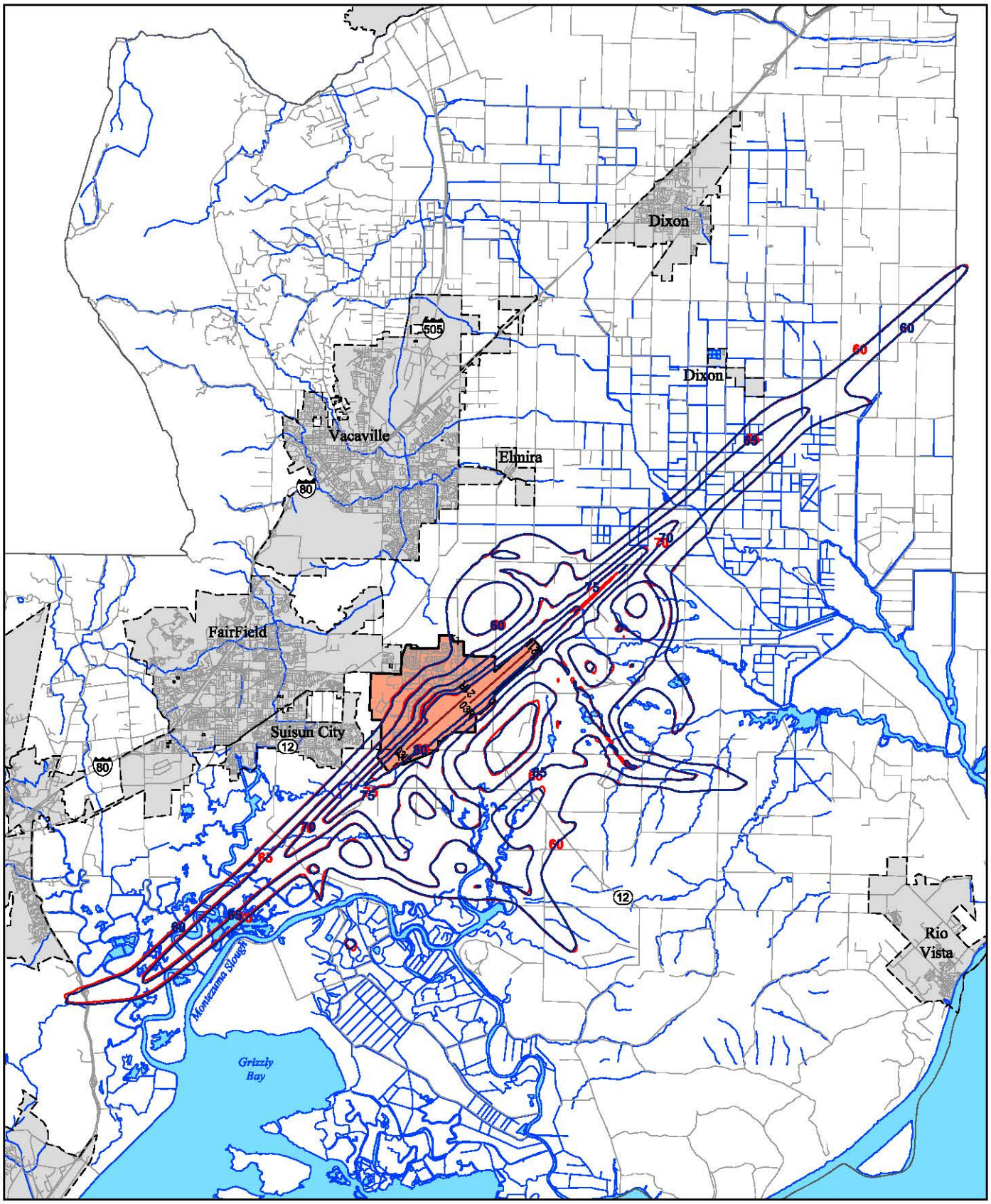
LEGEND

- CNEL 60 dB Contour
- CNEL 65 dB Contour
- CNEL 70 dB Contour
- CNEL 75 dB Contour
- CNEL 80 dB Contour
- Runway
- Roadway
- City Limits
- Travis AFB

Southern California Logistics Airport Alternative Noise Contours at Travis AFB

Figure 4-13

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Travis AFB

LEGEND

- No Action Alternative Noise Contours
- SCLA Alternative Noise Contours
- Runway
- Roadway
- City Limits
- Travis AFB

Comparison of No Action Alternative and Southern California Logistics Aiport Alternative Noise Contours at Travis AFB

Figure 4-14

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Table 4.3-2 Summary of Off-Base Land Area and Population Exposed to, and Population Potentially Highly Annoyed by CNEL 60 dBA and Greater, SCLA Alternative at Travis AFB

		CNEL Interval (dBA)				
Category	**60-65**	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres						
No Action Alternative	21,876	15,283	4,225	1,470	287	43,141
Travis AFB Alternative at Travis AFB	21,948	15,341	4,251	1,425	429	43,394
Change	+72	+58	+26	-45	+142	+253
Percent Change	0%	0%	+1%	-3%	-49%	+1%
Population						
No Action Alternative	254	102	13	6	0	375
Travis AFB Alternative at Travis AFB	261	100	14	6	0	381
Change	+7	-2	+1	0	0	+6
Percent Change	+3%	+2%	+8%	0%	0%	+2%
Population Potentially Highly Annoyed						
No Action Alternative	30	22	5	3	0	60
Travis AFB Alternative at Travis AFB	31	22	5	3	0	61
Change	+1	0	0	0	0	+1
Percent Change	+3%	0%	0%	0%	0%	+2%

Note: The No Action Alternative also is the baseline. Acres reflect only off-Base land area. People highly annoyed determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1-4.

The data in Table 4.2-3 and related discussion and analysis for the contribution of outdoor noise to indoor noise for the Proposed Action at Travis AFB in Subchapter 4.2.2 also apply. Based on the location of Travis AFB, the warm climate data would apply to buildings on and in the area surrounding the Base. The discussion and analyses for nonauditory health effects and the effects of aircraft noise on farm animals for the Proposed Action at Travis AFB in Subchapter 4.2.2 also apply.

Effects of Noise on Structures

As discussed in Subchapter 3.1.2.2, L_{max} is used to determine the potential effects to structures from sound. The L_{max} is the highest instantaneous sound pressure during a single noise event, no matter how long the sound may persist. No damage would occur to structures in the area surrounding Travis AFB from C-17 LZ operations because the L_{max} produced by the aircraft (*i.e.*, 113 dBA at 200 feet from the aircraft) would not exceed the level at which structural damage could occur.

4.3.2.3 Grant County Airport

Noise associated with the SCLA Alternative at the Grant County Airport would be generated by aircraft operations. There would be no change to the aircraft ground tracks depicted in Figure 3-15 as a result of the SCLA Alternative at the Grant County Airport. Figure 4-15 depicts the noise exposure area at the airport under the SCLA Alternative at

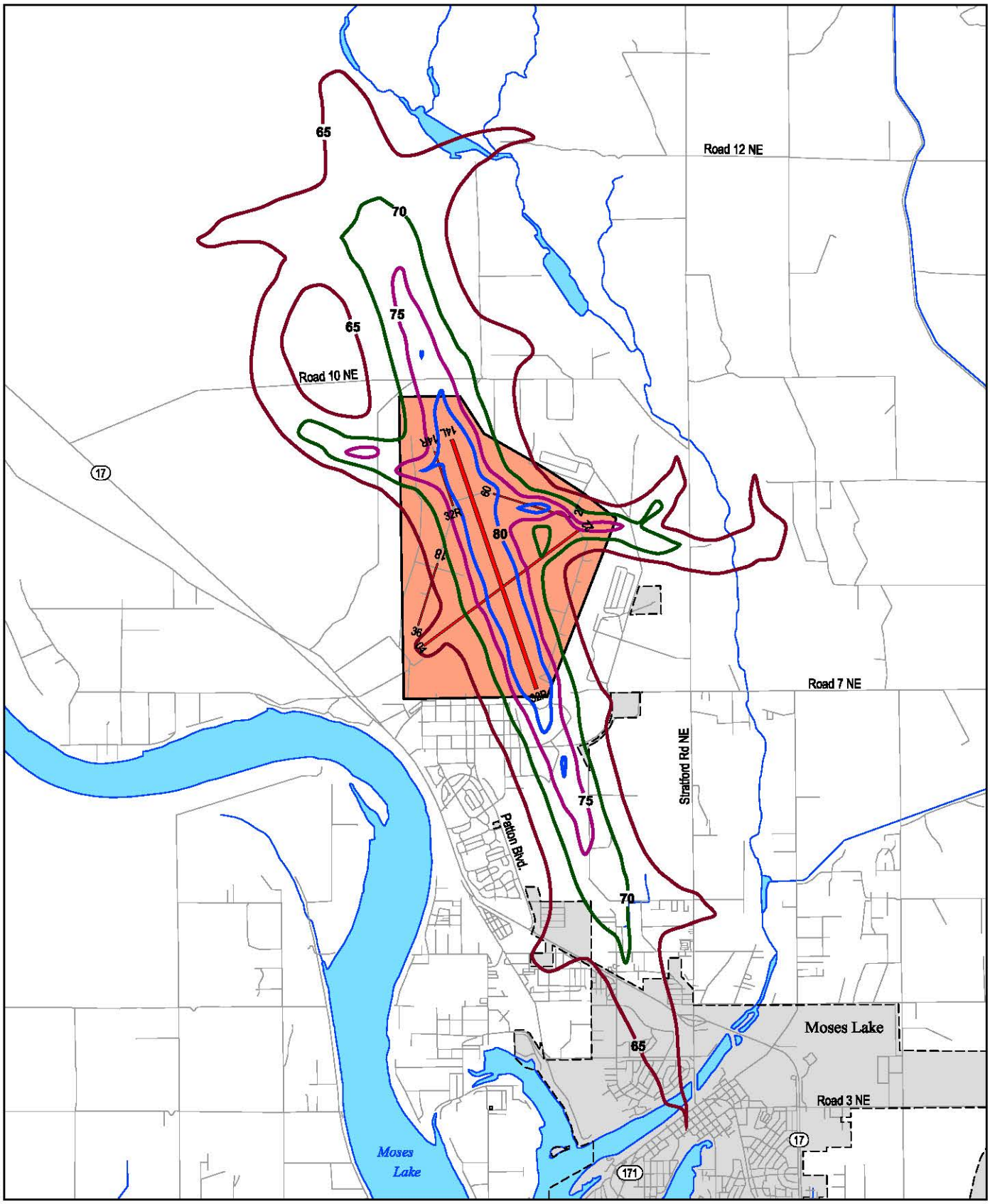
the Grant County Airport. Figure 4-16 compares the SCLA Alternative at the Grant County Airport and the No Action Alternative noise contours. The aircraft operations modeled include the average busy day aircraft operations for the SCLA Alternative at the Grant County Airport (see Table 2.2-8).

Single Event Noise Analysis

Each aircraft overflight yields a single-event noise level, presented as SEL. C-17 aircraft, which currently operate at the Grant County Airport, would continue to accomplish operations at the airport and on the LZ. Thus, the Grant County Airport and surrounding areas would continue to be exposed to SELs from C-17s at the levels listed in Table 3.3-1. The greatest SEL values for the aircraft operating at the Grant County Airport would continue to be produced by EA-6B aircraft (see Table 3.3-1), which are 11 dBA louder than the C-17.

The induced hearing data in Table 4.2-1 and related discussion in Subchapter 4.2.2 for the Proposed Action at Travis AFB also apply. Based on the level of noise exposure from the SCLA Alternative at the Grant County Airport, it is doubtful that an individual would be exposed to noise that would produce hearing loss.

Nearby schools would continue to be exposed to noise from aircraft operations. Assuming schools conduct teaching for an approximate 8-hour period (8:00 a.m. through 4:00 p.m.), about 40 percent of the 20-hour flying day would occur when classroom activities occur. Thus, approximately 40 percent of the additional 9.73 average daily C-17 operations (*i.e.*, 3.9 operations) would occur during school time. Based on an 8-hour school day and 3.9 operations, there would be an average of less than one additional overflight per hour that could interfere with classroom activities in schools that would be overflown. Based on FICAN recommendations, outdoor SELs of 80 to 100 dBA (60 to 80 dBA indoors) could result in 4 to 10 percent awakenings, respectively, in the exposed population. Over the course of sleeping, different individuals might be awakened by different events, and some individuals might be awakened more than once. Individuals in residences in the area around the Base would continue to be exposed to indoor SEL of 60 to 80 dBA during normal sleep periods (10:00 p.m. to 7:00 a.m.). There would be a combined total of 54 additional and off-airport persons exposed to DNL 65 dBA and greater as a result of the SCLA Alternative at the Grant County Airport. Assuming the number of sleep awakenings would be proportional to the increase in exposed population and that 10 percent of the persons would be awakened, about five additional persons potentially could be awakened when comparing the SCLA Alternative at the Grant County Airport to the baseline condition. Those individuals who sleep between 7:00 a.m. and 10:00 p.m. likely would be affected just as those persons who sleep during normal nighttime sleep periods.



Grant County Airport

LEGEND

- DNL 65 dBA Contour
- DNL 70 dBA Contour
- DNL 75 dBA Contour
- DNL 80 dBA Contour
- Runway
- Roadway
- City Limits
- Grant County International Airport

N

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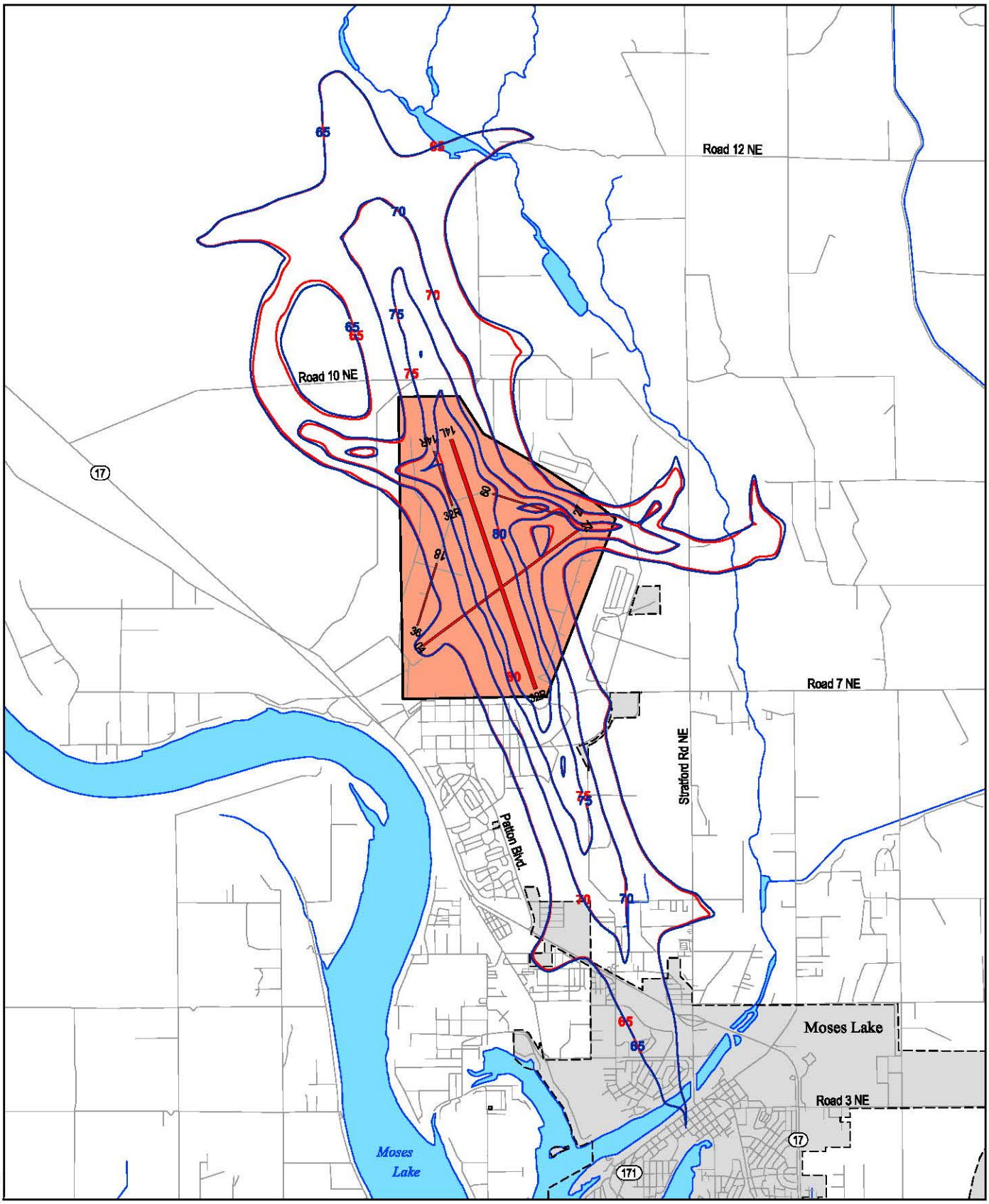
Feet

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Southern California Logistics Airport Alternative Noise Contours at Grant County Airport

Figure 4-15

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Comparison of No Action Alternative and Southern Cailfornia Logistics Airport Alternative Noise Contours at Grant County Airport

Figure 4-16

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Averaged Noise Analysis

Table 4.3-3 compares the SCLA Alternative at the Grant County Airport with the No Action Alternative (*i.e.*, baseline) for the following: off-airport land area and population exposed to noise of DNL 65 dBA and greater; and the population potentially highly annoyed.

Overall, the SCLA Alternative at the Grant County Airport noise contours would be nearly identical to the No Action Alternative (*i.e.*, baseline) (see Figure 4-16), with the number of off-airport acres in the DNL 65 dBA and greater exposure area increasing by 10 percent. People would continue to be exposed to aircraft noise in three of the four noise zones (see Table 4.3-3), with the DNL 65-70 dBA noise zone containing 2,018 of the 2,139 persons exposed to DNL 65-dBA and greater. These 2,147 persons would equate to 17 percent of the estimated 12,373 persons (based on 2000 census data) who live within the approximate 5-mile radius area associated with airfield airspace environment, or no change when compared to the No Action Alternative (*i.e.*, baseline). The density of residences in the newly exposed area would be consistent with adjacent residential areas exposed to aircraft noise under the No Action Alternative (*i.e.*, baseline). The overall number of persons who could be potentially highly annoyed by noise exposure would be 489 people, or 13 additional persons when compared to the No Action Alternative (baseline).

Table 4.3-3 Summary of Off-Airport Land Area and Population Exposed to, and Population Potentially Highly Annoyed by DNL 65 dBA and Greater, Southern California Logistics Airport Alternative at Grant County Airport

Category	DNL Interval (dBA)				Total
	65-70	70-75	75-80	80+	
Acres					
No Action Alternative	4,446	1,354	427	35	6,262
SCLA Alternative at the Grant County Airport	4,987	1,410	445	37	6,879
Change	+541	+56	+18	+2	+617
Percent Change	+12%	+4%	+4%	+6%	+10%
Population					
No Action Alternative	1,969	114	2	0	2,085
SCLA Alternative at the Grant County Airport	2,018	119	2	0	2,139
Change	+49	+5	0	0	+54
Percent Change	+2%	+4%	0%	0%	+3%
Population Potentially Highly Annoyed					
No Action Alternative	433	42	1	0	476
SCLA Alternative at the Grant County Airport	444	44	1	0	489
Change	+11	+2	0	0	+13
Percent Change	+3%	+5%	0%	0%	+3%

Note: The No Action Alternative is also the baseline. Acres reflect only off-Base land area. People highly annoyed determined by multiplying the total number of people in the noise zone times the higher percent number for the interval in Table 3.1-4.

The data in Table 4.2-3 and related discussion and analysis for the contribution of outdoor noise to indoor noise for the Proposed Action at Travis AFB in Subchapter 4.2.2 also apply. Based on the location of the Grant County Airport, the cold climate data would apply to buildings on and in the area surrounding the airport. The discussion and analyses for nonauditory health effects and the effects of aircraft noise on farm animals for the Proposed Action at Travis AFB in Subchapter 4.2.2 also apply.

Effects of Noise on Structures

As discussed in Subchapter 3.1.2.2, L_{max} is used to determine the potential effects to structures from sound. The L_{max} is the highest instantaneous sound pressure during a single noise event, no matter how long the sound may persist. No damage from C-17 LZ operations would occur to structures in the area surrounding the Grant County Airport because the L_{max} produced by the aircraft (*i.e.*, 113 dBA at 200 feet from the aircraft) would not exceed the level at which structural damage could occur.

4.3.2.4 Mitigation

There would be no significant impacts. No mitigation is recommended.

4.3.2.5 Cumulative Impacts

Southern California Logistics Airport

None of the other actions includes aircraft noise. Therefore, cumulative noise analysis applies only to construction. Based on the distance from the LZ construction site to the closest other action construction site, noise from LZ construction would attenuate to levels that, when combined with the noise from other action construction, would not produce cumulative impacts.

Travis AFB

None of the other actions include projects that would generate noise from aircraft operations. Additionally, the SCLA Alternative at Travis AFB would generate no noise from construction because the LZ would be established by painting the LZ on Runway 21L/03R. Therefore, there would be no cumulative noise from the other actions and the SCLA Alternative at Travis AFB.

4.3.3 Land Use

4.3.3.1 Southern California Logistics Airport

Implementation of the SCLA Alternative at the SCLA would increase noise contours when compared to the No Action Alternative (baseline) conditions (see Figure 4-11). The areas of increased noise exposure occur primarily to the north, west, and south of the airfield. Land uses in the area of increased exposure are primarily open and the increase in noise would not impact land uses.

The SCLA could update its Airport Master Plan to reflect the FAA-established airspace imaginary surfaces for the LZ and the noise contours resulting from the aircraft operations. RPZs could be established for the LZ in accordance with FAA Advisory Circular 150/5300-13, *Airport Design*. Figure 4-17 depicts the approximate locations for the LZ RPZs should the SCLA establish RPZs. The dimensions for a RPZ for a visual approach, nonprecision runway from which large aircraft operate (*e.g.*, an LZ) are: 1,000 feet long; 500 feet wide at the inner end, which is 200 feet from the runway end; and 700 feet wide at the outer end. The total area of the RPZ is 13.77 acres. As noted in Figure 4-17, portions of the RPZs that could be established would occur outside SCLA property.

The City of Victorville could update its Comprehensive Airport Land Use Plan to reflect the changes to Safety Review Areas 1 and 3 resulting from the construction of the LZ. The update also could include the update to Safety Review Area 2 resulting from the additional area exposed to CNEL 65 dBA to the west and northwest of the airfield (see Figure 4-10).

4.3.3.2 Travis AFB

On-Base land use conflicts would not be expected from the establishment and operation of the LZ. Land uses would be compatible with the general character of existing and planned Base land use patterns. The Travis AFB General Plan incorporated mission scenarios such as the SCLA Alternative at Travis AFB in the future land use and future development components of the General Plan.

There would be no change in the location or the dimensions of CZs or APZs associated with Runways 21Left/03Right and 03Left/21Right. It would not be necessary to establish a 1,000-foot exclusion area centered on the longitudinal axis of the LZ (500 feet to each side of the LZ centerline) in accordance with ETL 04-7 because the LZ would be established by painting the LZ markings on Runway 21Left/03Right. The exclusion area for the LZ would fall within the primary surface that currently exists for Runway 21Left/03Right. The primary surface for Runway 21Left/03Right is an imaginary surface symmetrically centered on the runway, extending 200 feet beyond each runway end that defines the limits of the obstruction clearance requirements in the vicinity of the landing area. The width of the primary surface is 2,000 feet, or 1,000 feet on each side of the runway centerline. It would not be necessary to establish CZs and APZs at the ends of the LZ because they would fall within the existing primary surface for Runway 21Left/03Right.

In accordance with AICUZ program guidance, Travis AFB may provide the SCLA Alternative at Travis AFB noise contours and the land use sections of NEPA documentation and any other relative data to local planning agencies to serve as an interim AICUZ report. A full update to the Travis AFB AICUZ Report would be provided to the community within one year after the completed mission change, funding and other constraints permitting.

As mentioned in Subchapter 4.3.2.2, the SCLA Alternative at Travis AFB noise contours would be nearly identical to the No Action Alternative (*i.e.*, baseline) contours (see Figure 4-14). Figure 4-18 compares the SCLA Alternative at Travis AFB noise contours with the ALUC noise contours. As shown in the figure, the SCLA Alternative at Travis AFB noise contours would not extend outward from the runway as far as the ALUC noise contours. Thus, the SCLA Alternative at Travis AFB would be consistent with the Solano County ALUC and City of Fairfield General Plan.

4.3.3.3 Grant County Airport

As depicted in Figure 4-16, there is minimal difference between the SCLA Alternative at the Grant County Airport noise contours and the No Action Alternative (baseline) noise contours. Therefore, land use plans for the local community would not be affected. The SCLA Alternative at the Grant County Airport would not require the airport to update or revise its 2005 Airport Master Plan or affect the FAR Part 77 imaginary surfaces or RPZs.

4.3.3.4 Mitigation

There would be no significant impacts. No mitigation is recommended.

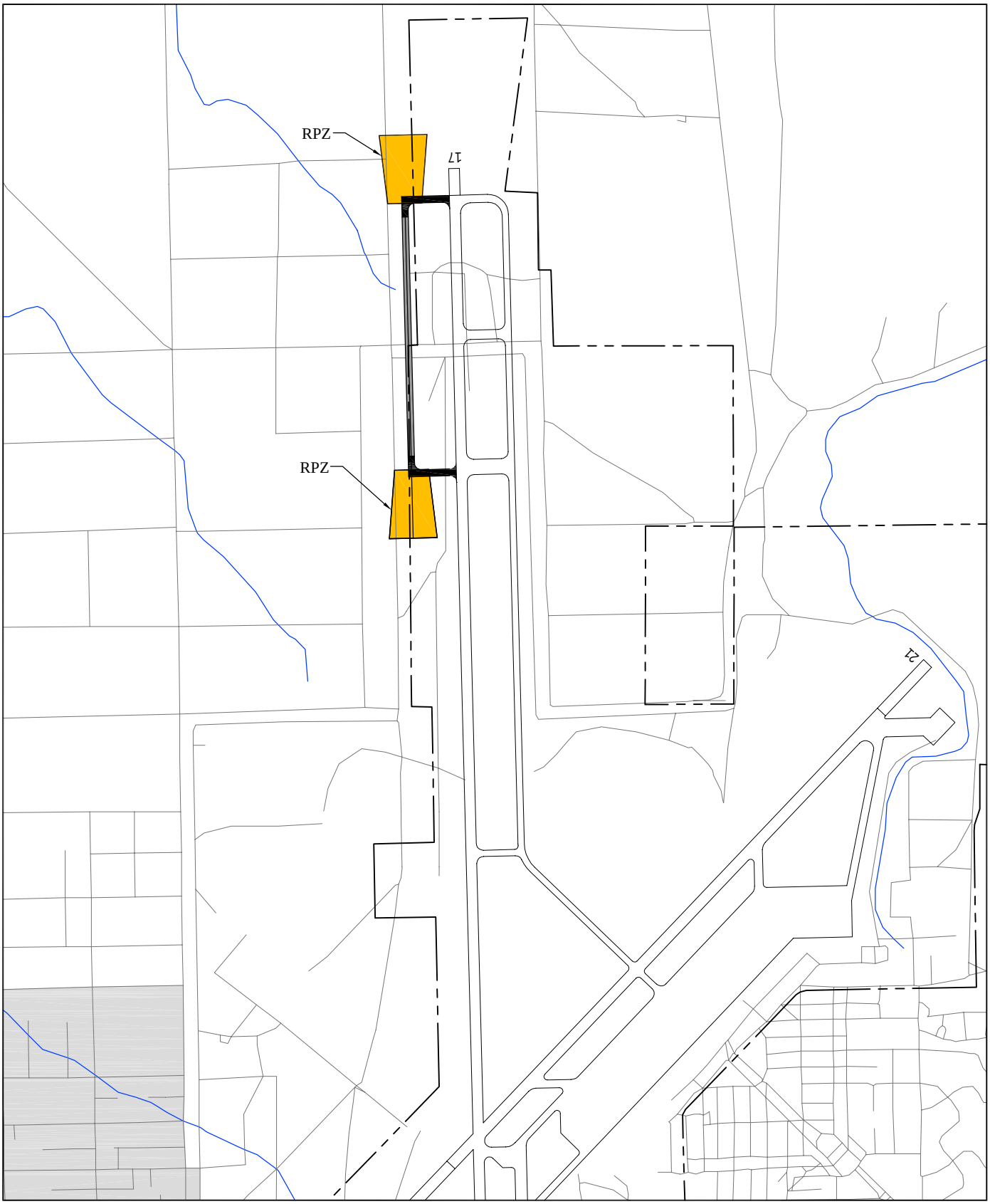
4.3.3.5 Cumulative Impacts

Southern California Logistics Airport

Other facilities would be constructed on the SCLA; however, none of the other facilities would be constructed in the general area associated with the LZ (see Figures 2-6 and 2-9). As with the SCLA Alternative at the SCLA facilities, the other facility actions would be compatible with the SCLA Airport Master Plan. Thus, the facility construction anticipated under the cumulative condition would be consistent with existing and future land use plans and programs identified in the Master Plan.

Travis AFB

Other facilities would be constructed on Travis AFB; however, none of the other facilities would be constructed in the general area associated with the LZ that would be established on Runway 21Left/03Right. The other facility actions would be compatible with the Travis AFB General Plan. Thus, the facility construction anticipated under the cumulative condition would be consistent with existing and future land use plans.



Southern California Logistics Airport

LEGEND

- Proposed Landing Zone Location
- Installation Boundary
- RPZ — Runway Protection Zone

N

0 2,000 Feet

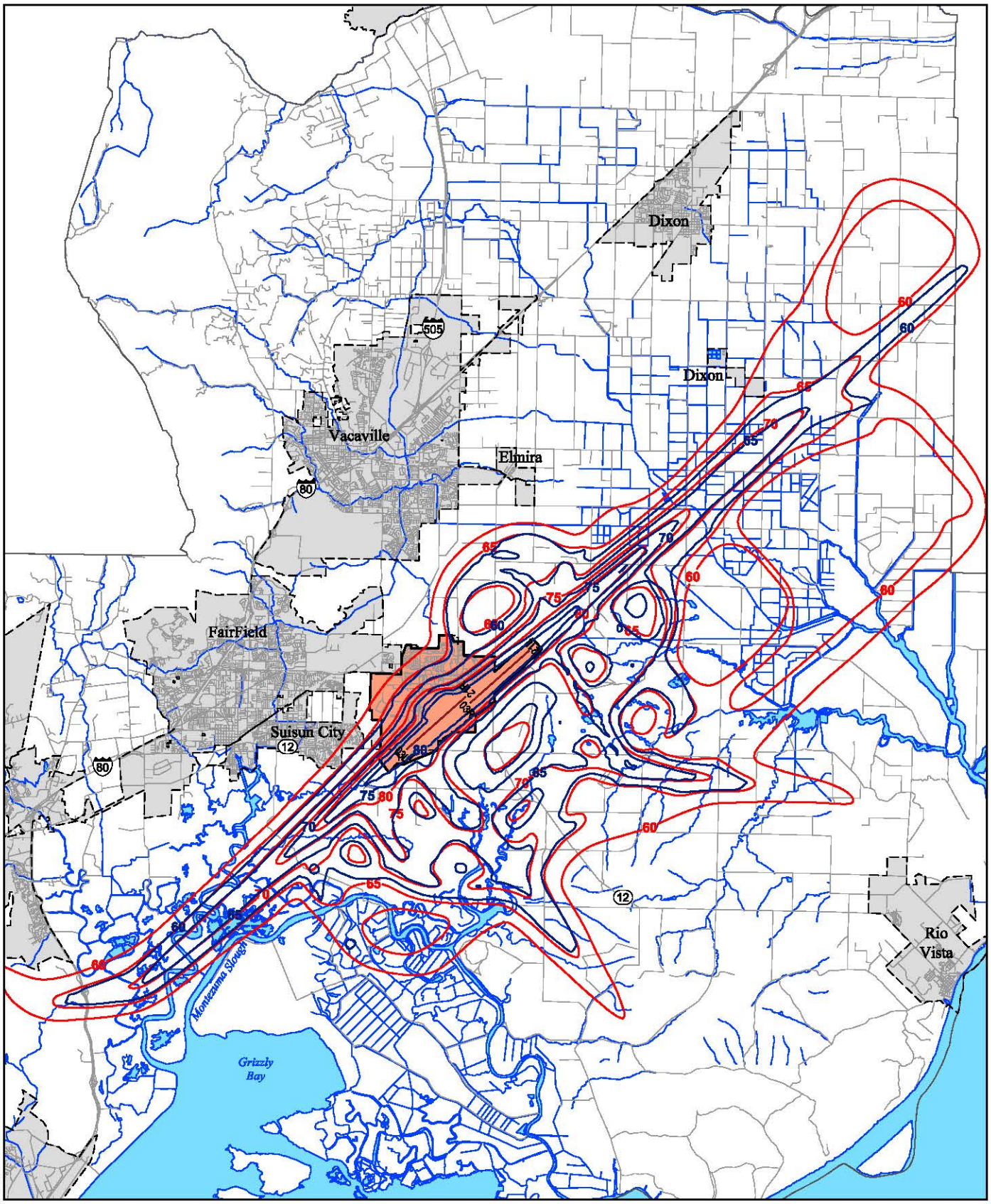
Note:
Proposed LZ and RPZ locations are approximate.

Location of Runway Protection Zones, Southern California Logistics Airport Landing Zone Alternative

Figure 4-17

744211 WCLZ-SCL-RPZ.DWG

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Travis AFB

LEGEND

- Land Use Compatibility Plan Noise Contours
- SCLA Alternative Noise Contours
- Runway
- Roadway
- City Limits
- Travis AFB

N

0 19,000 Feet

Comparison of Land Use Compatibility Plan and Southern California Logistics Airport Alternative Noise Contours at Travis AFB

Figure 4-18

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4.3.3.6 Grant County Airport

As depicted in Figure 4-16, there is minimal difference between the SCLA Alternative at the Grant County Airport noise contours and the No Action Alternative (baseline) noise contours. Therefore, land use plans for the local community would not be affected. The SCLA Alternative at the Grant County Airport would not require the airport to update or revise its 2005 Airport Master Plan or affect the FAR Part 77 imaginary surfaces or RPZs.

4.3.3.7 Mitigation

There would be no significant impacts. No mitigation is recommended.

4.3.3.8 Cumulative Impacts

Southern California Logistics Airport

Other facilities would be constructed on the SCLA; however, none of the other facilities would be constructed in the general area associated with the LZ (see Figures 2-6 and 2-9). As with the SCLA Alternative at the SCLA facilities, the other facility actions would be compatible with the SCLA Airport Master Plan. Thus, the facility construction anticipated under the cumulative condition would be consistent with existing and future land use plans and programs identified in the Master Plan.

Travis AFB

Other facilities would be constructed on Travis AFB; however, none of the other facilities would be constructed in the general area associated with the LZ that would be established on Runway 21Left/03Right. The other facility actions would be compatible with the Travis AFB General Plan. Thus, the facility construction anticipated under the cumulative condition would be consistent with existing and future land use plans.

4.3.4 Air Quality

4.3.4.1 Southern California Logistics Airport

The total direct and indirect short term VOC and NO_X emissions from the SCLA Alternative at the SCLA (*i.e.*, construction emissions, which would be 4 tpy and 21 tpy, respectively for VOC and NO_X), would be below the *de minimis* thresholds established for these pollutants within AQCR 33. As summarized in Table 4.3-4, the net change in emissions for the pollutants of concern (*i.e.*, VOC and NO_X), would not be regionally significant. A federal action would be considered regionally significant when the total emissions from the proposed action equal or exceed 10 percent of the nonattainment or maintenance area's emissions inventory for any criteria pollutant. The AQCR is in attainment for CO, SO_X, PM_{10} and $PM_{2.5}$. As summarized in Table 4.3-4, the emissions for these four pollutants would be less than 10 percent of the emissions inventory.

Table 4.3-4 Emissions from SCLA Alternative at the SCLA and Comparison to Conformity Significance and *de minimis* Thresholds

Category	Pollutants Emitted (tons/year)					
	CO	**VOC**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Emissions Inventory	219,146	45,954	84,680	4,709	175,711	53,619
Short Term Construction Emissions						
Net Change in Short-Term Emissions from SCLA Alternative Construction at SCLA	+56	**+4**	**+21**	+2	+13	+3
Net Change in Short-Term Emissions as Percent of Inventory	0.026%	**0.009%**	**0.025%**	0.043%	0.007%	0.006%
de minimis Threshold	NA	**100**	**100**	NA	NA	NA
Net Change in Short Term Emissions Exceed *de minimis?*	NA	**No**	**No**	NA	NA	NA
Net Change in Short Term Emissions Regionally Significant? (>10%)	NA	**No**	**No**	NA	NA	NA
Emissions Inventory	219,146	45,954	84,680	4,709	175,711	53,619
Long Term Emissions from Recurring Aircraft Operations						
Net change in Emissions from SCLA Alternative Recurring Aircraft Operations at SCLA	+5	**+1**	**+63**	+3	+13	+13
Emissions from Baseline Aircraft Operations	134	104	76	6	18	18
Total Emissions from Recurring Aircraft Operations	139	**105**	**139**	9	31	31
Net Change in Emissions from Recurring Aircraft Operations as Percent of Inventory	0.002%	**0.002%**	**0.074%**	0.064%	0.007%	0.024%
Total Emissions from Recurring Aircraft Operations as Percent of Inventory	0.063%	**0.228%**	**0.164%**	0.191%	0.018%	0.058%
de minimis Threshold	100	100	100	NA	NA	NA
Net Change in Emissions from Recurring Aircraft Operations Exceed *de minimis?*	No	**No**	**No**	NA	NA	NA
Net Change in Emissions from Recurring Aircraft Operations Regionally Significant? (>10%)	No	**No**	**No**	NA	NA	NA

NA – Not Applicable. De minimis does not apply since AQCR is in attainment for pollutant.
***Bold** indicates pollutants of concern for SCLA.*

The total direct and indirect VOC and NO_X emissions from the SCLA Alternative recurring aircraft operations at the SCLA (*i.e.*, the net change in emissions, which would be 1 tpy and 63 tpy, respectively for VOC and NO_X) would be below the *de minimis* thresholds established for these pollutants within AQCR 33. As summarized in Table 4.3-4, the net change in emissions for the pollutants of concern (*i.e.*, VOC and NO_X), would not be regionally significant.

Based on the information in Table 4.3-4 and the preceding paragraph, it is determined that the SCLA Alternative at the SCLA positively conforms to the SIP for the AQCR. The Air Force is supporting an activity demonstrated by USEPA standards not to cause or contribute to new violations of any NAAQS in the affected area, nor increase the frequency or severity of an existing violation. Implementation of the federal action would not delay timely attainment of pollutant standards in any area of the AQCR, and the action would be in compliance or would be consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of a positive General Conformity determination for the SCLA Alternative at the SCLA fulfills the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B. A Conformity Determination would not be required.

4.3.4.2 Travis AFB

Table 4.3-5 compares the net change in emissions associated with the SCLA Alternative at Travis AFB with *de minimis* thresholds for AQCR 30 and states whether or not the emissions exceed *de minimis* or would be regionally significant. No construction would occur; therefore, emissions would occur only from recurring aircraft operations. The methods used to calculate and analyze aircraft operations emissions for the Proposed Action at Travis AFB were used for the SCLA Alternative at Travis AFB.

The total direct and indirect CO, VOC, and NO_X emissions from the SCLA Alternative aircraft operations at Travis AFB (*i.e.*, the net change in emissions, which would be 1, 0, and 11 tpy, respectively for CO, VOC, and NO_X) would be below the *de minimis* thresholds established for these pollutants within AQCR 30. As summarized in Table 4.3-5, the net change in emissions for the pollutants of concern (*i.e.*, CO, VOC, and NO_X), would not be regionally significant. A federal action would be considered regionally significant when the total emissions from the proposed action equal or exceed 10 percent of the nonattainment or maintenance area's emissions inventory for any criteria pollutant. The AQCR is in attainment for SO_X, PM_{10} and $PM_{2.5}$. As summarized in Table 4.3-5, the emissions for these three pollutants would be less than 10 percent of the emissions inventory.

Table 4.3-5 Emissions from SCLA Alternative at Travis AFB and Comparison to Conformity Significance and *de minimis* Thresholds

Category	Pollutants Emitted (tons/year)					
	CO	**VOC**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Emissions Inventory	807,636	141,109	199,619	19,710	77,928	33,033
SCLA Alternative Emissions from Recurring Aircraft Operations at Travis AFB (net change in emissions)	**+1**	**0**	**+11**	+1	+2	+2
Emissions from Baseline Aircraft Operations	**384**	**175**	**1,378**	59	104	103
Total Emissions from Recurring Aircraft Operations	**385**	**175**	**1,389**	60	106	105
Net Change in Emissions from Recurring Aircraft Operations as Percent of Inventory	**0.000%**	**0.000%**	**0.006%**	0.005%	0.003%	0.006%
Total Emissions from Recurring Aircraft Operations as Percent of Inventory	**0.048%**	**0.124%**	**0.696%**	0.304%	0.136%	0.318%
de minimis Threshold	**100**	100	100	NA	NA	NA
Net Change in Emissions from Recurring Aircraft Operations Exceed *de minimis*?	**No**	**No**	**No**	NA	NA	NA
Net Change in Emissions from Recurring Aircraft Operations Regionally Significant? (>10%)	**No**	**No**	**No**	NA	NA	NA

NA – Not Applicable. De minimis does not apply since AQCR is in attainment for pollutant. nc=not calculated in USAF 2003a.

***Bold** indicates pollutants of concern for Travis AFB.*

Operation of a permanent LZ in the western United States would complete the west coast C-17 basing action initiated in 2003. Table 4.3-6 lists the emissions from recurring aircraft operations for the completed C-17 basing action at Travis AFB (*i.e.*, basing action emissions plus LZ operations emissions) and compares the combined emissions with the USEPA-approved 2006 SIP budget emissions for Travis AFB. As presented in Table 4.3-6, the emissions from recurring aircraft operations for the completed C-17 basing action at Travis AFB (*i.e.*, basing action emissions plus LZ operations emissions) will not exceed the emissions in the USEPA-approved SIP budget for the base.

Table 4.3-6 Comparison of Recurring Aircraft Emissions for SCLA Alternative at Travis AFB to Travis AFB SIP Budget Emissions Levels

	CO (tpy)	VOC (tpy)	NO_X (tpy)
Emissions from Basing Action Recurring Aircraft Operations	384	175	1,378
Emissions from Recurring LZ Operations	1	0	11
Combined Recurring Aircraft Operations Emissions	385	175	1,389
SIP Budget Emissions	4,216	2,383	1,734
Comparison of Combined Recurring Aircraft Emissions to SIP Budget	-3,831	-2,208	-345

Based on the information in Tables 4.3-5 and 4.3-6, it is determined that the SCLA Alternative at Travis AFB positively conforms to the SIP for the AQCR. The Air Force is supporting an activity demonstrated by USEPA standards not to cause or contribute to new violations of any NAAQS in the affected area, nor increase the frequency or severity of an existing violation. Implementation of the federal action would not delay timely attainment of pollutant standards in any area of the AQCR, and the action would be in compliance or would be consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of a positive General Conformity determination for the SCLA Alternative at Travis AFB fulfills the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B. A Conformity Determination would not be required.

4.3.4.3 Grant County Airport

Table 4.3-7 shows the emissions that would occur from the SCLA Alternative aircraft operations that would be accomplished at the Grant County Airport, the resultant total emissions for all aircraft operations at the airport, and compares the emissions (*i.e.*, net change and total emissions) with the baseline AQCR emissions inventory. No construction would occur; therefore, emissions would occur only from recurring aircraft operations. The methods used to calculate and analyze aircraft operations emissions for the Proposed Action at Travis AFB were used for the SCLA Alternative at the Grant County Airport.

The total direct and indirect PM_{10} emissions from the SCLA Alternative aircraft operations at the Grant County Airport (*i.e.*, 11 tpy for PM_{10}) would be below the *de minimis* threshold established for this pollutant within AQCR 62. As summarized in Table 4.3-7, the net change in emissions for the pollutant of concern (*i.e.*, PM_{10}), would not be regionally significant. A federal action would be considered regionally significant when the total emissions from the proposed action equal or exceed 10 percent of the nonattainment or maintenance area's emissions inventory for any criteria pollutant. The AQCR is in attainment for CO, NO_X, VOC, and SO_x. As summarized in Table 4.3-7, the emissions for these four pollutants would be less than 10 percent of the emissions inventory.

Table 4.3-7 Emissions from SCLA Alternative at Grant County Airport and Comparison to Conformity Significance and *de minimis* Thresholds

	Criteria Air Pollutant (tpy)					
	CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Emissions Inventory	394,296	69,253	56,620	9,077	**134,609**	38,987
Net Change in Emissions from SCLA Alternative Recurring Aircraft Operations at the Grant County Airport	+4	+1	+51	+2	**+11**	+11
Emissions from Baseline Aircraft Operations	543	213	652	36	**125**	124
Total Emissions from Recurring Aircraft Operations	547	214	703	38	**136**	135
Net Change in Emissions from Recurring Aircraft Operations as Percent of Inventory	0.001%	0.001%	0.090%	0.022%	**0.008%**	0.028%
Total Emissions from Recurring Aircraft Operations as Percent of Inventory	0.139%	0.309%	1.242%	0.419%	**0.101%**	0.346%
de minimis Threshold	NA	NA	NA	NA	**100**	100
Net Change in Emissions from Recurring Aircraft Operations Exceed *de minimis* Threshold?	NA	NA	NA	NA	**No**	NA
Net Change in Emissions from Recurring Aircraft Operations Regionally Significant? (>10%)	NA	NA	NA	NA	**No**	NA

NA – Not Applicable. De minimis does not apply since AQCR is in attainment for pollutant.
***Bold** indicates pollutants of concern.*

Based on the information in Table 4.3-7 and the preceding paragraph, it is determined that the SCLA Alternative at the Grant County Airport positively conforms to the SIP for the AQCR. The Air Force is supporting an activity demonstrated by USEPA standards not to cause or contribute to new violations of any NAAQS in the affected area, nor increase the frequency or severity of an existing violation. Implementation of the federal action would not delay timely attainment of pollutant standards in any area of the AQCR, and the action would be in compliance or would be consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of a positive General Conformity determination for the SCLA Alternative at the Grant County Airport fulfills the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B. A Conformity Determination would not be required.

4.3.4.4 Mitigation

There would be no significant impacts. No mitigation is recommended.

4.3.4.5 Cumulative Impacts

Southern California Logistics Airport

Numerous construction projects would occur under other actions announced for the SCLA. The methods for calculating emissions for the Proposed Action at Travis AFB were used to estimate cumulative emissions. Table 4.3-8 summarizes the emissions from the combination of the other actions and the SCLA Alternative at the SCLA and compares the emissions with the baseline AQCR emissions inventory.

Table 4.3-8 SCLA Alternative Cumulative Emissions at the SCLA

Activity	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
AQCR CY05 Totals	219,146	45,954	84,680	4,709	175,711	53,619
Construction Emissions (net change)						
Other Action Emissions	9	2	20	2	9	1
SCLA Alternative Emissions	56	4	21	2	13	3
Total Construction Emissions	65	6	41	4	22	4
Net Change in Construction Emissions as Percent of AQCR Emissions	0.030%	0.013%	0.048%	0.085%	0.013%	0.007%
Aircraft Emissions (net change)						
SCLA Alternative	8	2	78	4	17	17
Combined Construction and Aircraft Operations Emissions	73	**8**	**119**	8	39	21
Net Change in Emissions from Construction and Aircraft Operations as Percent of Inventory	0.033%	**0.017%**	**0.141%**	0.170%	0.022%	0.039%
de minimis Threshold	NA	**50**	**100**	NA	NA	NA
Exceed *de minimis* Threshold?	Yes	**No**	**Yes**	NA	NA	NA
Regionally Significant? (>10%)	No	**No**	**No**	NA	NA	NA

NA – Not Applicable. De minimis does not apply since AQCR is in attainment for pollutant.
***Bold** indicates pollutants of concern for SCLA.*

The cumulative combined net change (*i.e.*, construction plus aircraft emissions) in total direct and indirect emissions for VOC and NO_X (*i.e.*, 8 and 119 tpy, respectively) would be less than 10 percent of the emissions inventory, and the action would not be considered regionally significant. While the additional direct and indirect VOC emissions would be below the *de minimis* threshold established for this pollutant (*i.e.*, 50 tpy), the increase in direct and indirect NO_X emissions exceeds the *de minimis* threshold established for this pollutant (*i.e.*, 100 tpy).

There would be no cumulative emissions from recurring aircraft operations because only the SCLA Alternative at the SCLA has aircraft emissions. As noted in the analysis for the SCLA Alternative at the SCLA, the total direct and indirect VOC and NO_X emissions from the SCLA Alternative aircraft operations at the SCLA would be below the *de minimis* thresholds and would not be regionally significant.

Construction emissions would be short-term and would end when the projects are completed. Thus, when considering long-term emissions from recurring aircraft

operations, the total direct and indirect VOC and NO_X emissions from the SCLA Alternative aircraft operations at the SCLA would be below the *de minimis* thresholds and would not be regionally significant. Thus, for recurring aircraft operations, the Air Force would be supporting an activity demonstrated by USEPA standards not to cause or contribute to new violations of any NAAQS in the affected area, nor increase the frequency or severity of an existing violation. Implementation of the federal action would not delay timely attainment of pollutant standards in any area of the AQCR, and the action would be in compliance or would be consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of a positive General Conformity determination for the SCLA Alternative at the SCLA fulfills the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B. A Conformity Determination would not be required.

Travis AFB

None of the other actions include projects that would generate emissions from aircraft operations. Additionally, the SCLA Alternative at Travis AFB would generate no emissions from construction because the LZ would be established by painting the LZ on Runway 21L/03R. Therefore, there would be no cumulative emissions from the other actions and the SCLA Alternative at Travis AFB.

4.3.5 Biological Resources

4.3.5.1 Southern California Logistics Airport

The SCLA Alternative may affect populations of the federally listed desert tortoise (threatened), the state-listed Mojave ground squirrel (threatened), and/or the burrowing owl (state species of concern). However, conservation and minimization measures would minimize any harming or harassing of these species. Construction of the LZ at the SCLA would result in permanent habitat removal. Other federally and state-listed species are associated with a riparian corridor to the east of the SCLA and would not be impacted by the SCLA Alternative.

4.3.5.2 Travis AFB

No special status species would be affected by the SCLA Alternative at Travis AFB because the LZ would be established by painting the LZ on Runway 21L/3R, obviating the need for ground disturbance or additional impervious cover.

4.3.5.3 Mitigation

The SCLA Alternative would require conservation measures similar to those for the Proposed Action at Travis AFB to avoid, minimize, or offset impacts to the desert tortoise, Mojave ground squirrel, and/or the burrowing owl. The Air Force would conduct the necessary protocol surveys approved by the USFWS and/or CDFG to minimize impacts at the SCLA as appropriate. Conservation and minimization options

could include purchasing credits through the Desert Tortoise Preserve Committee for assistance in land preserve acquisition or in-lieu fee payments to conservation organizations that manage for species of concern that could potentially be affected by the SCLA Alternative. Other conservation and minimization measures could be developed in consultation with the CDGF and the USFWS Carlsbad Ecological Services Field Office.

There would be no significant impacts at Travis AFB. No mitigation is recommended.

4.3.5.4 Cumulative Impacts

Southern California Logistics Airport

As with the SCLA Alternative at the SCLA, the other projects considered for cumulative impact purposes would occur within developed, maintained areas with highly modified and disturbed landscape that is now either paved or has lawns and landscaping. There would be no cumulative disturbance of high quality and/or native vegetation within either the project or adjacent areas due to the alternative action and other projects at the SCLA.

Travis AFB

Although construction occurs as a result of the other actions at Travis AFB, there would be no potential for cumulative biological resources impacts because no construction would occur at the Base under the SCLA Alternative.

4.3.6 Cultural Resources

4.3.6.1 Southern California Logistics Airport

The SCLA Alternative at the SCLA includes construction of a permanent LZ adjacent to the existing runway in areas previously disturbed by construction activities, and does not involve any demolition or alteration of buildings or structures. No NRHP-eligible resources were identified at the SCLA. No Native American groups responded to the notification letter. The SCLA Alternative at the SCLA would have no effect on cultural resources.

4.3.6.2 Travis AFB

The SCLA Alternative at Travis AFB includes establishment of an LZ on Runway 21Left/03Right, and does not involve any construction or demolition or alteration of buildings or structures. No NRHP-eligible resources were identified in the ROI at Travis AFB. One Native American Group responded to the notification letter. The SCLA Alternative at Travis AFB would have no effect on cultural resources.

4.3.6.3 Grant County Airport

The SCLA Alternative at the Grant County Airport would not involve any new construction, ground-disturbing activities, or demolition or alteration of buildings or structures. No NRHP-eligible resources were identified at the Grant County Airport. No Native American groups responded to the notification letter. The SCLA Alternative at the Grant County Airport would have no effect on cultural resources.

4.3.6.4 Mitigation

There would be no significant impacts. No mitigation is recommended.

4.3.6.5 Cumulative Impacts

Southern California Logistics Airport

The SCLA Alternative at the SCLA is one of a number of other planned projects involving construction on the airport. The potential for cumulative impacts from the SCLA Alternative at the SCLA and other actions is minimal based on the distance between project sites. As with the LZ, construction of the other actions would occur in areas previously disturbed by construction activities. No NRHP-eligible resources were identified at the SCLA. No cumulative adverse effects on significant cultural resources would occur.

Travis AFB

The potential for cumulative impacts from the SCLA Alternative at Travis AFB and other actions is minimal based on the distance between project sites. The potential for cumulative impacts between the SCLA Alternative at Travis AFB and other projects would be prevented or minimized through implementation of the procedures identified in the Travis AFB ICRMP. No cumulative adverse effects on significant cultural resources would occur when combining the other actions with implementation of the SCLA Alternative at Travis AFB.

4.4 UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts would result from implementation of the Proposed Action at Travis AFB.

Air Quality

Air emissions from aircraft operations is an unavoidable condition. The Air Force's consultation with the State of California would ensure the air emissions from the Proposed Action at Travis AFB would conform to the California SIP for attainment of air quality standards.

Noise

Noise resulting from anticipated aircraft operations is an unavoidable condition. However, the effects of aircraft noise would not be considered significant.

Safety

The potential for aircraft mishaps is an unavoidable condition. Although the potential for this unavoidable situation would increase when compared to the baseline condition, the increase would not be considered significant and the risk is low that an aircraft involved in an in-flight accident would strike a structure or person.

Biological Resources

LZ construction would remove vegetation and wildlife that occupies or uses the affected area. The project site is in an area of the base that was previously disturbed and would not presently provide significant habitat for many species. Plants and wildlife would be extirpated from the site, decreasing site floral and faunal diversity. The Air Force is in formal consultation with the USFWS and, when the process is concluded, the loss of flora and fauna would not be considered significant.

4.5 RELATIONSHIP BETWEEN SHORT-TERM USES AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The proposed action would not result in intensification of land use within the areas surrounding the respective airfield. Implementation of the Proposed Action, the SCLA Alternative, or the No Action Alternative would not represent a loss of open space. Therefore, it is not anticipated that the Proposed Action, SCLA Alternative, or No Action Alternative would result in any cumulative land use or aesthetic impacts. Long-term productivity of land within the area around the respective airfield would not be affected by implementation of the Proposed Action.

Irreversible and Irretrievable Commitment of Resources

The irreversible environmental changes that would result from implementation of the Proposed Action, the SCLA Alternative, or the No Action Alternative involve consumption of energy resources. The use of this resource is considered to be permanent.

Energy Resources

Jet fuel would be used for aircraft operations and would be irretrievably lost. However, the amount of jet fuel consumed would not be greater than that assessed in the West Coast C-17 Basing EA because the proposed action in this EA does not include additional sorties and flying time than that previously assessed.

Land

Open land would be lost to the constructed LZ; however, the amount of land that would be lost is minimal when compared to the surrounding area and is land that was previously set aside in airport plans for airfield use.

Human Resources

No additional personnel would be added to a result of the Proposed Action, SCLA Alternative, or No Action Alternative. Thus, there would be no impact to human resources.

Biological Resources

The Proposed Action and SCLA Alternative would result in the irreversible destruction or loss of the vegetation and wildlife habitat on proposed construction sites. Neither action would remove a significant amount of open space or undeveloped land currently functioning as biological habitat. Although the loss of flora and fauna would be permanent, the effect of the loss of the resources would be minimized through measures resulting from the Air Force-USFWS consultation process.

CHAPTER 5
LIST OF PREPARERS

Name	Degree	Resource	Years of Experience
Bupp, Susan	B.A., Anthropology M.A., Anthropology	Cultural Resources	31
Crisologo, Rosemarie	B.S., Biological Sciences M.S., Environmental Engineering	Public Involvement	24
Houston, Taylor	B.A., Natural Resource Management	Biological Resources	7
Miller, Dorothy	B.S., Mathematics	Aircraft Noise Modeling	29
Moeur, John	Ph.D., Zoology	Biological Resources	28
Schnapp, Angela	B.S., Nuclear Engineering M.S., Environmental Engineering	Air Quality	9
Wallin, John	B.A., Biology M.A., Management	Project Manager; Airspace and Airfield Operations, BASH, and Aircraft Safety; Noise; Land Use	37
Wooten, R.C., Ph.D.	Ph.D., Ecology and Biology	Technical Manager	39

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CHAPTER 6
PERSONS AND AGENCIES CONSULTED

The following persons and agencies consulted during preparation of this EA.

Brooks City-Base, Texas, Headquarters Air Force Center for Engineering and the Environment

Dickinson, Scott (HQ AFCEE/TDW)
Maxwell, Laura (HQ AFCEE/ICM)

Scott AFB, Illinois, Headquarters Air Mobility Command

Allbright, Doug (HQ AMC/A7PC)

Travis Air Force Base, California, 60th Air Mobility Wing

Bass, John Lt (60 CES/CEVN)
Castillo, Paul MSgt (60 AMW/C-17PO)
Dorcey, Paul Lt Col (60 AMW/C-17PO)
Kelley, Thomas (60 OSS/OSO)
Marty, Jaymee Maj (60 CES/CEV)
Parrott, Gregory (60 AMW/JA)
Pontemayor, Rodolfo (60 CES/CEVP)
Williams, Wayne (60 CES/CEV)

McChord Air Force Base, Washington, 62nd Airlift Wing

Ryan, John (62 OSS/OSK)

Southern California Logistics Airport, Victorville, California

Soderquist, Peter (Airport Manager)

Grant County International Airport, Moses Lake, Washington

Reda, Carl (Air Traffic Control Tower)

United States Fish and Wildlife Service, Sacramento, California Fish and Wildlife Office

Sanchez, Ken (Assistant Field Supervisor)

AhaMaKav Cultural Society, Fort Mojave Indian Tribe, Mohave Valley, Arizona

Linda Otero, Director

Cortina Band of Indians, Williams, California

Elaine Patterson, Chairperson

Chemehuevi Reservation, Chemehuevi Valley, California

Charles Wood, Chairperson

Colville Business Council, Nespelem, Washington

Mike Marchand, Chairman

Kesner Flores, Wheatland, California

Morongo Band of Mission Indians, Cabazon, California

Britt W. Wilson, Cultural Resources Project Manager

Rumsey Rancheria, Brooks, California

Marshall McKay, Chairperson

San Fernando Band of Mission Indians, Newhall, California

John Valenzuela, Chairperson

San Manuel Band of Mission Indians, Highland, California

Henry Duro, Chairperson

Ann Brierty, Environmental Department

Serrano Band of Indians, Highland, California

Goldie Walker

Spokane Business Council, Wellpinit, Washington

Richard L. Sherwood, Chairman

Tehachapi Indian Tribe, Acton, California

Charlie Cooke

Wintun Environmental Protection Agency, Williams, California

Ron Wermuth, Kernville, California

Yakama Tribal Council, Toppenish, Washington

Lavina Washines, Chairwoman

CHAPTER 7
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APPENDIX A
INTERAGENCY AND INTERGOVERNMENTAL CORRESPONDENCE FOR ENVIRONMENTAL PLANNING

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Air Force Instruction (AFI) 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning*, provides the procedures to comply with applicable federal, state, and local directives for Interagency and Intergovernmental Coordination for Environmental Planning (IICEP). The AFI implements the following:

- Air Force Planning Document 32-70, *Environmental Quality*;
- Department of Defense (DoD) Directive 4165.61, *Intergovernmental coordination of DoD Federal Development Programs and Activities*;
- Executive Order 12372, *Intergovernmental Review of Federal Programs*;
- Title IV of the *Intergovernmental Coordination Act (ICA) of 1968*; and
- Section 204 of the *Demonstration Cities and Metropolitan Development Act of 1966*.

Section 401(b) of the ICA states that, "All viewpoints-national, regional, state, and local…will be fully considered…when planning federal or federally assisted development programs and projects."

To comply with the IICEP, Travis AFB notified numerous agencies in California of the intent to prepare an EA for the establishment and operation of a permanent western United States landing zone. A California Form A was included with the notification letter sent to the California Clearinghouse. The letter to the agencies, the distribution list, and the California Form A are contained in this appendix.

The draft EA was sent to federal, state, and local agencies for review. A California Form A was included with the draft EA sent to the California Clearinghouse. The letter to the agencies, the distribution list, and the California Form A are contained in this appendix.

Three responses to the draft EA were received from governmental agencies. The responses, as well as how the California Department of Fish and Game comments were addressed in the final EA, are contained in this appendix.

The final EA with signed FONSI was was sent to federal, state, and local agencies. The letter transmitting the final EA to the agencies are included in this appendix. A California Form A was included with the final EA sent to the California Clearinghouse.

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DEPARTMENT OF THE AIR FORCE

HEADQUARTERS AIR MOBILITY COMMAND

MEMORANDUM FOR SEE DISTRIBUTION

FROM: HQ AMC/A7P
507 Symington Drive
Scott AFB IL 62225-5022

SUBJECT: Environmental Assessment to Construct a Permanent C-17 Landing Zone in the Southwestern United States

The U.S. Air Force is preparing an Environmental Assessment (EA) for the proposed construction of a C-17 Landing Zone (LZ) for aircraft operations in the southwestern United States. The proposed LZ allows C-17 aircraft predominantly from California (Travis Air Force Base and March Air Reserve Base) to conduct required tactical day and night training.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation and solicit comments on the attached Description of Proposed Actions and Alternatives (DOPAA) for this EA. Comments may include any issues related to this EA. The following paragraph describes the Proposed Action, an alternative action, and the No Action Alternative. Please provide any comments no later than 30 days from the date of this letter directly to Mr. Doug Allbright, HQ AMC/A7PC, 507 Symington Drive, Scott AFB, Illinois 62225-5022.

The proposed action would construct a 3,500 foot-long, 90-foot wide LZ, a 300 foot-long overrun at each end, and connecting taxiways at Travis AFB. The alternative would construct the same size LZ at the Southern California Logistics Airport (SCLA, formerly George AFB), Victorville, California. The proposed location of the Travis LZ is 350 feet east of Runway 21Left/03Right. The SCLA Alternative would construct the LZ 700 feet west of Runway 17/35 on airport property. Both LZ locations are depicted at attachment 1. Construction would begin in 2008 and be completed in 2009. C-17 and C-130 aircraft will perform approximately 18,300 operations annually at the LZ once constructed. Under the No Action Alternative, a permanent C-17 LZ would not be constructed in the southwest.

Additionally, we solicit your assistance to identify any resources within your agency's purview that may be impacted. We also request any point-of-contact information, relevant documentation available that would assist in preparing the EA, or identification of any other major projects you're aware of that may contribute to cumulative effects and would facilitate cumulative impact analysis for this EA.

If members of your staff have any questions on this EA, our point of contact is Mr Doug Allbright, (618) 229-0846. For local issues, our POC at Travis AFB is Mr. Rudy Pontemayor, (707) 424-7517.

FRANK GINES, Colonel, USAFR
Acting Chief, Plans & Programs Division
Directorate of Installations & Mission Support

Attachments:
1. DOPAA Permanent Landing Zone Location
2. Distribution List

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Distribution List

Federal Aviation Administration Planning and Programming San Francisco Airports Division Attn: Mr. Joe Rodriguez 831 Mitten Road, Room 210 Burlingame, CA 94010	US Forest Service Ecosystem Planning Pacific Southwest Region Attn: Ms. Kathy Clement 1323 Club Drive Vallejo, CA 94592
Department of the Interior Office of Environmental Policy and Compliance Attn: Ms. Patricia Port 1111 Jackson Street, Suite 520 Oakland, CA 94607	U.S. Department of Interior Fish and Wildlife Service Federal Building 2800 Cottage, Room W-2605 Sacramento, CA 95825-1846
U.S. Environmental Protection Agency Region 9 75 Hawthorne Street San Francisco, CA 94105	AFF AWP-910 1500 Aviation Blvd. Hawthorne, CA 90250
Governor's Office of Planning and Research State Clearinghouse P.O. Box 3044 Sacramento, CA 95814	State Historic Preservation Officer Department of Parks and Recreation P.O. Box 942896 Sacramento, CA 94296-0001
Air Force Western Regional Environmental Office Attn: Mr. Gary Munsterman AFCEE/CCR-S 333 Market Street., Suite 600 San Francisco, CA 94105	California Department of Fish and Game P.O. Box 944209 Sacramento, CA 94299-2090
California Air Resources Board Air Quality and Transportation Division 1001 "I" Street P.O. Box 2815 Sacramento, CA 95812	Bay Area AQMD 939 Ellis Street San Francisco, CA 94109-7799
Yolo-Solano AQMD 1947 Galileo Ct., Ste 103 Davis, CA 95616-4882	Department of Resource Management Solano County 675 Texas Street, Suite 5500 Fairfield, CA 94533
Antelope Valley AQMD 43301 Division Street, Suite 206 Lancaster CA 93535	Kern County APCD 2700 "M" Street, Suite 302 Bakersfield, California 93301-2370

Mojave Desert AQMD 14306 Park Ave. Victorville, CA 92392	Imperial County APCD 150 South 9th Street El Centro, CA 92243-2801
South Coast AQMD 21865 Copley Dr. Diamond Bar, CA 91765	

Form A

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P. O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # _____

Project Title: ENVIRONMENTAL ASSESSMENT PERMANENT SOUTHWESTERN UNITED STATES C-17 LANDING ZONE
Lead Agency: U.S. AIR FORCE / 60TH AIR MOBILITY WING Contact Person: MR. RUDY PONTEMAYOR
Mailing Address: 60 CES/CEV 411 ARMEN DR Phone: 707/424-7517
City: TRAVIS AFB, CA Zip: 94535 County:

Project Location:
County: SOLANO / SAN BERNARDINO City/Nearest Community: _____ Total Acres: _____
Cross Streets: _____ Zip Code: _____
Assessor's Parcel No. _____ Section: _____ Twp. _____ Range: _____ Base: _____
Within 2 Miles: State Hwy #: _____ Waterways: _____
Airports: _____ Railways: _____ Schools: _____

Document Type:

CEQA: ☐ NOP ☐ Draft EIR NEPA: ☐ NOI Other: ☐ Joint Document
☐ Early Cons ☐ Supplement to EIR (Note prior SCH # below) ☐ EA ☐ Final Document
☐ Neg Dec ☐ Subsequent EIR (Note prior SCH # below) ☐ Draft EIS ☐ Other _____
☐ Mit Neg Dec ☐ Other _____ ☐ FONSI

Local Action Type:

☐ General Plan Update ☐ Specific Plan ☐ Rezone ☐ Annexation
☐ General Plan Amendment ☐ Master Plan ☐ Prezone ☐ Redevelopment
☐ General Plan Element ☐ Planned Unit Development ☐ Use Permit ☐ Coastal Permit
☐ Community Plan ☐ Site Plan ☐ Land Division (Subdivision, etc.) ☒ Other NEPA DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

Development Type:

☐ Residential: Units_____ Acres_____
☐ Office: Sq.ft._____ Acres_____ Employees_____
☐ Commercial: Sq.ft._____ Acres_____ Employees_____
☐ Industrial: Sq.ft._____ Acres_____ Employees_____
☐ Educational _____
☐ Recreational _____

☐ Water Facilities: Type_____ MGD_____
☐ Transportation: Type_____
☐ Mining: Mineral _____
☐ Power: Type_____ MW _____
☐ Waste Treatment: Type_____ MGD_____
☐ Hazardous Waste: Type_____
☒ Other: N/A

Project Issues Discussed in Document:

☐ Aesthetic/Visual ☐ Fiscal ☐ Recreation/Parks ☐ Vegetation
☐ Agricultural Land ☐ Flood Plain/Flooding ☐ Schools/Universities ☐ Water Quality
☐ Air Quality ☐ Forest Land/Fire Hazard ☐ Septic Systems ☐ Water Supply/Groundwater
☐ Archeological/Historical ☐ Geologic/Seismic ☐ Sewer Capacity ☐ Wetland/Riparian
☐ Biological Resources ☐ Minerals ☐ Soil Erosion/Compaction/Grading ☐ Growth Inducement
☐ Coastal Zone ☐ Noise ☐ Solid Waste ☐ Land Use
☐ Drainage/Absorption ☐ Population/Housing Balance ☐ Toxic/Hazardous ☐ Cumulative Effects
☐ Economic/Jobs ☐ Public Services/Facilities ☐ Traffic/Circulation ☒ Other N/A THIS DOCUMENT

Present Land Use/Zoning/General Plan Designation:

N/A

Project Description: *(please use a separate page if necessary)*

CONSTRUCT A C-17 LANDING ZONE AND CONDUCT AIRCRAFT OPERATIONS ON THE ZONE (SEE LETTER TRANSMITTING THIS FORM FOR PROJECT DESCRIPTION)

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

September 2005

Reviewing Agencies Checklist

continued

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X". If you have already sent your document to the agency please denote that with an "S".

_____Air Resources Board
_____Boating & Waterways, Department of
_____California Highway Patrol
_____Caltrans District #_____
_____Caltrans Division of Aeronautics
_____Caltrans Planning
_____Coachella Valley Mountains Conservancy
_____Coastal Commission
_____Colorado River Board Commission
_____Conservation, Department of
_____Corrections, Department of
_____Delta Protection Commission
_____Education, Department of
_____Office of Public School Construction
_____Energy Commission
_____Fish & Game Region # _____
_____Food & Agriculture, Department of
_____Forestry & Fire Protection
_____General Services, Department of
_____Health Services, Department of
_____Housing & Community Development
_____Integrated Waste Management Board
_____Native American Heritage Commission
_____Office of Emergency Services
_____Office of Historic Preservation
_____Parks & Recreation
_____Pesticide Regulation, Department of
_____Public Utilities Commission
_____Reclamation Board
_____Regional WQCB #_____
_____Resources Agency
_____S.F. Bay Conservation & Development Commission
_____San Gabriel & Lower Los Angeles Rivers & Mountains Conservancy
_____San Joaquin River Conservancy
_____Santa Monica Mountains Conservancy
_____State Lands Commission
_____SWRCB: Clean Water Grants
_____SWRCB: Water Quality
_____SWRCB: Water Rights
_____Tahoe Regional Planning Agency
_____Toxic Substances Control, Department of
_____Water Resources, Department of

_____Other _____
_____Other _____

Local Public Review Period (to be filled in by lead agency)

Starting Date N/A FOR THIS DOCUMENT Ending Date _____

Lead Agency (Complete if applicable):

Consulting Firm: PARSONS
Address: 8000 CENTRE PARK DR
City/State/Zip: AUSTIN, TX 78754
Contact: JOHN WALLIN
Phone: (512) 719-6010

Applicant: 60 CES/CEV
Address: 411 AIRMEN DR
City/State/Zip: TRAVIS AFB, CA 94535
Phone: (707) 424-7517

Signature of Lead Agency Representative JM Wall Date 1/3/07

Authority cited: Section 21083 and 21087, Public Resources Code. Reference: Section 21161, Public Resources Code.

PARSONS

8000 Centre Park Drive, Suite 200 • Austin, Texas 78754 • (512) 719-6000 • Fax: (512) 719-6099 • www.parsons.com

July 11, 2008

Re: Draft Environmental Assessment
Permanent Western United States C-17 Landing Zone

To Whom It May Concern:

The United States Air Force, with Parsons assistance, has prepared a Draft Environmental Assessment (EA) for the proposed establishment of C-17 Landing Zones (LZs) for aircraft operations on an permanent basis in the western United States. The proposed LZs would allow C-17 aircraft from Travis Air Force Base (AFB), California to conduct required day and night training. The Draft EA describes and analyzes alternative plans to implement the Proposed Action, the Southern California Logistics Airport Alternative, and the No Action Alternative.

Please review the enclosed Draft EA and provide any comments or concerns you may have by August 12, 2008 to Mr. Doug Allbright, HQ AMC/A7PI, 507 Symington Drive, Scott AFB, IL 62225, (618) 229-0846, fax (618) 256-8624. The point of contact for local issues at Travis AFB is Mr. Rudy Pontemayor, 60 CES/CEAN, 411 Airmen Drive, Travis AFB, CA 94535, (707) 424-7517, fax (707) 424-0894.

Sincerely,

PARSONS

Peggy Bezlaudy (for)

John Wallin

Attachments: 1. Distribution List
2. Draft EA

Distribution List

Federal Aviation Administration Planning and Programming San Francisco Airports Division Attn: Mr. Joe Rodriguez 831 Mitten Road, Room 210 Burlingame, CA 94010	Federal Aviation Administration Northwest Mountain Region 1601 Lind Ave. SW Renton, WA 98055
Department of the Interior Office of Environmental Policy and Compliance Attn: Ms. Patricia Port 1111 Jackson Street, Suite 520 Oakland, CA 94607	U.S. Department of Interior Fish and Wildlife Service Federal Building 2800 Cottage, Room W-2605 Sacramento, CA 95825-1846
U.S. Environmental Protection Agency Region 9 75 Hawthorne Street San Francisco, CA 94105	California Department of Fish and Game P.O. Box 944209 Sacramento, CA 94299-2090
Governor's Office of Planning and Research State Clearinghouse P.O. Box 3044 Sacramento, CA 95814	State Historic Preservation Officer Department of Parks and Recreation P.O. Box 942896 Sacramento, CA 94296-0001
Air Force Western Regional Environmental Office Attn: Mr. Gary Munsterman AFCEE/CCR-S 333 Market Street., Suite 600 San Francisco, CA 94105	Department of Resource Management Solano County 675 Texas Street, Suite 5500 Fairfield, CA 94533
California Air Resources Board Air Quality and Transportation Division 1001 "I" Street P.O. Box 2815 Sacramento, CA 95812	Bay Area AQMD 939 Ellis Street San Francisco, CA 94109-7799
Yolo-Solano AQMD 1947 Galileo Ct., Ste 103 Davis, CA 95616-4882	Kern County APCD 2700 "M" Street, Suite 302 Bakersfield, California 93301-2370
Antelope Valley AQMD 43301 Division Street, Suite 206 Lancaster CA 93535	South Coast AQMD 21865 Copley Dr. Diamond Bar, CA 91765

Mojave Desert AQMD 14306 Park Ave. Victorville, CA 92392	Imperial County APCD 150 South 9th Street El Centro, CA 92243-2801
Washington Department of Natural Resources P.O. Box 190 Colville, WA 99114	Washington State Department of Ecology Eastern Regional Office – Air Quality N. 4601 Monroe St, Suite 100 Spokane, WA 99205-1295
State of Washington Environmental Review Washington Department of Ecology P.O. Box 47600 Olympia, WA 98504	Southern California Logistics Airport Mr. Peter Soderquist, Airport Director 18374 Phantom Victorville, CA 92394
Executive Manager Port of Moses Lake 7810 Andrews St. N. E., Suite 200 Moses Lake, WA 98837	Mr. Frank J. Andrews 1107 Kentucky Street Fairfield, CA 94533
Mr. Richard C. Jacobs Howard Rice Nemerovski Canady Falk & Rabkin Three Embarcadero Center Seventh Floor San Francisco, CA 94111-4024	Mike Marchand, Chairman Colville Business Council P.O. Box 150 Nespelem, WA 99155-0150
Richard L. Sherwood, Chairman Spokane Business Council P.O. Box 100 Wellpinit, WA 99040-0100	Lavina Washines, Chairwoman Yakama Tribal Council P.O. Box 151 Toppenish, Wa 98948-0151
Linda Otero, Director AhaMaKav Cultural Society Fort Mojave Indian Tribe P.O. Box 5990 Mohave Valley, AZ 86440	Elaine Patterson, Chairperson Cortina Band of Indians P.O. Box 1630 Williams, CA 95987
Charles Wood, Chairperson Chemehuevi Reservation P.O. Box 1976 Chemehuevi Valley, CA 92363	Britt W. Wilson, Cultural Resources-Project Manager Morongo Band of Mission Indians 49750 Seminole Drive Cabazon, CA 92230
Marshall McKay, Chairperson Rumsey Rancheria P.O. Box 18 Brooks, CA 95606	John Valenzuela, Chairperson San Fernando Band of Mission Indians P.O. Box 221838 Newhall, CA 91322
Henry Duro, Chairperson San Manuel Band of Mission Indians 26569 Community Center Drive Highland, CA 92346	Ann Brierty, Environmental Department San Manuel Band of Mission Indians 101 Pure Water Lane Highland, CA 92346
Goldie Walker Serrano Band of Indians 6588 Valeria Drive Highland, CA 92346	Wintun Environmental Protection Agency P.O. Box 1839 Williams, CA 95987
Charlie Cooke Tehachapi Indian Tribe 32835 Santiago Road Acton, CA 993510	Kesner Flores P.O. Box 1047 Wheatland, CA 95692
Ron Wermuth P.O. Box 168 Kernville, CA 93238	Muzzy Farms 1107 Kentucky Street Fairfield, CA 94533
Weintraub Genshlea Chediak Attn: Mr. Michael A. Kvarme 400 Capitol Mall, Eleventh Floor Sacramento, CA 95814	

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Form A

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P. O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # _____

Project Title: ENVIRONMENTAL ASSESSMENT PERMANENT WESTERN UNITED STATES C-17 LANDING ZONE

Lead Agency: U. S. AIR FORCE / 60TH AIR MOBILITY WING Contact Person: MR. RUDY PONTEMAYOR

Mailing Address: 60 CES/CEAN, 411 ARMEN DR Phone: 707/424-7517

City: TRAVIS AFB, CA Zip: 94535 County: _____

Project Location:

County: SOLANO / SAN BERNARDINO City/Nearest Community: _____ Total Acres: _____

Cross Streets: _____ Zip Code: _____

Assessor's Parcel No. _____ Section: _____ Twp. _____ Range: _____ Base: _____

Within 2 Miles: State Hwy #: _____ Waterways: _____

Airports: _____ Railways: _____ Schools: _____

Document Type:

CEQA: ☐ NOP ☐ Draft EIR NEPA: ☐ NOI Other: ☐ Joint Document
☐ Early Cons ☐ Supplement to EIR (Note prior SCH # below) ☑ EA DRAFT ☐ Final Document
☐ Neg Dec ☐ Subsequent EIR (Note prior SCH # below) ☐ Draft EIS ☐ Other _____
☐ Mit Neg Dec ☐ Other _____ ☑ FONSI DRAFT

Local Action Type:

☐ General Plan Update ☐ Specific Plan ☐ Rezone ☐ Annexation
☐ General Plan Amendment ☐ Master Plan ☐ Prezone ☐ Redevelopment
☐ General Plan Element ☐ Planned Unit Development ☐ Use Permit ☐ Coastal Permit
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☐ Commercial: Sq.ft. _____ Acres _____ Employees _____
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☐ Water Facilities: Type _____ MGD _____
☐ Transportation: Type _____
☐ Mining: Mineral _____
☐ Power: Type _____ MW _____
☐ Waste Treatment: Type _____ MGD _____
☐ Hazardous Waste: Type _____
☒ Other: NA

Project Issues Discussed in Document:

☐ Aesthetic/Visual ☐ Fiscal ☐ Recreation/Parks ☐ Vegetation
☐ Agricultural Land ☐ Flood Plain/Flooding ☐ Schools/Universities ☐ Water Quality
☑ Air Quality ☐ Forest Land/Fire Hazard ☐ Septic Systems ☐ Water Supply/Groundwater
☑ Archeological/Historical ☐ Geologic/Seismic ☐ Sewer Capacity ☐ Wetland/Riparian
☑ Biological Resources ☐ Minerals ☐ Soil Erosion/Compaction/Grading ☐ Growth Inducement
☐ Coastal Zone ☑ Noise ☐ Solid Waste ☑ Land Use
☐ Drainage/Absorption ☐ Population/Housing Balance ☐ Toxic/Hazardous ☐ Cumulative Effects
☐ Economic/Jobs ☐ Public Services/Facilities ☐ Traffic/Circulation ☑ Other AIRCRAFT OPERATIONS

Present Land Use/Zoning/General Plan Designation:

N/A

Project Description: *(please use a separate page if necessary)*

CONSTRUCT AND OPERATE A C-17 LANDING ZONE IN THE WESTERN UNITED STATES

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September 2005

Reviewing Agencies Checklist

continued

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_____California Highway Patrol
_____Caltrans District #_____
_____Caltrans Division of Aeronautics
_____Caltrans Planning
_____Coachella Valley Mountains Conservancy
_____Coastal Commission
_____Colorado River Board Commission
_____Conservation, Department of
_____Corrections, Department of
_____Delta Protection Commission
_____Education, Department of
_____Office of Public School Construction
_____Energy Commission
_____Fish & Game Region # _____
_____Food & Agriculture, Department of
_____Forestry & Fire Protection
_____General Services, Department of
_____Health Services, Department of
_____Housing & Community Development
_____Integrated Waste Management Board
_____Native American Heritage Commission
_____Office of Emergency Services
_____Office of Historic Preservation
_____Parks & Recreation
_____Pesticide Regulation, Department of
_____Public Utilities Commission
_____Reclamation Board
_____Regional WQCB #_____
_____Resources Agency
_____S.F. Bay Conservation & Development Commission
_____San Gabriel & Lower Los Angeles Rivers & Mountains Conservancy
_____San Joaquin River Conservancy
_____Santa Monica Mountains Conservancy
_____State Lands Commission
_____SWRCB: Clean Water Grants
_____SWRCB: Water Quality
_____SWRCB: Water Rights
_____Tahoe Regional Planning Agency
_____Toxic Substances Control, Department of
_____Water Resources, Department of

_____Other _____
_____Other _____

Local Public Review Period (to be filled in by lead agency)

Starting Date JULY 14, 2008 Ending Date AUGUST 12, 2008

Lead Agency (Complete if applicable):

Consulting Firm: PARSONS
Address: 8000 CENTRE PARK DR
City/State/Zip: AUSTIN, TX 78754
Contact: JOHN WALLIN
Phone: (512) 719-6000

Applicant: 60 CES/CEAN
Address: 411 AIRMEN DR
City/State/Zip: TRAVIS AFB, CA 94535
Phone: (707) 424-7517

Signature of Lead Agency Representative JM Wallin Date 7/9/08

Authority cited: Section 21083 and 21087, Public Resources Code. Reference: Section 21161, Public Resources Code.

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		20080711	FB4427S193 XOO5XXXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*

IMPERIAL COUNTY APCD
150 SOUTH 9TH STREET
EL CENTRO, CA 92243-2801

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR

PHONE: 760-482-4606
IMPERIAL COUNTY APCD
150 SOUTH 9TH STREET
EL CENTRO, CA 92243-2801

12. DATE SHIPPED *(YYYYMMDD)*:

b. 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA

AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
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17. SPECIAL HANDLING:

18. RECAPITULATION OF SHIPMENT

ISSUED BY: Dac

CHECKED BY: HSOLA 6193

PACKED BY:

TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
		TOTAL →		

1107

19. RECEIPT

	DATE *(YYYYMMDD)*	BY	
CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE *(YYYYMMDD)*	BY	GRAND TOTAL
POSTED	DATE *(YYYYMMDD)*	BY	20. RECEIVER'S VOUCHER NO.

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Ship date	Jul 11, 2008			
Delivery date	Jul 14, 2008 9:48 AM	**Destination**	EL CENTRO, CA	Tracking a FedEx SmartPost Shipment? Go to shipper login
		Delivered to	Receptionist/Front Desk	
		Service type	Priority Overnight	
		Weight	4.0 lbs.	
Status	Delivered			
Signature image available	Yes			

Date/Time		Activity	Location	Details
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	8:48 AM	On FedEx vehicle for delivery	IMPERIAL, CA	
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	2:32 PM	Picked up	PACHECO, CA	



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7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*
GOVERNOR'S OFFICE OF PLANNING & RESEARCH, STATE CLEARING HOUSE
1400 TENTH ST.
SACRAMENTO, CA 95814

9. AUTHORITY OR PURPOSE
TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*
SHERY CASSIDY

3. SHIP TO - MARK FOR
PHONE: 916-445-0613
GOVERNOR'S OFFICE OF PLANNING & RESEARCH, STATE CLEARING HOUSE
1400 TENTH ST.
SACRAMENTO, CA 95814

12. DATE SHIPPED *(YYYYMMDD)*:

b. 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

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AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (I)
1	Booklet (15 copies ea) THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. X Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO

17. SPECIAL HANDLING

18. RECAPITULATION OF SHIPMENT

ISSUED BY	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
Dave					
CHECKED BY: HSOLA 8193					
PACKED BY					
			← TOTAL →		

1107

19. RECEIPT

CONTAINERS RECEIVED EXCEPT AS NOTED	DATE (YYYYMMDD)	BY	SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE (YYYYMMDD)	BY	GRAND TOTAL
POSTED	DATE (YYYYMMDD)	BY	20. RECEIVER'S VOUCHER NO.

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Delivery date	Jul 14, 2008 10:26 AM	**Destination**	SACRAMENTO, CA
		Delivered to	Shipping/Receiving
		Service type	Priority Overnight
		Weight	49.0 lbs.
Status	Delivered		
Signature image available	Yes		

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Jul 14, 2008	9:56 AM	**Delivered**	SACRAMENTO, CA	
	8:28 AM	On FedEx vehicle for delivery	SACRAMENTO, CA	
	7:50 AM	At local FedEx facility	SACRAMENTO, CA	
Jul 12, 2008	6:26 AM	At dest sort facility	SACRAMENTO, CA	
Jul 11, 2008	8:09 PM	Package data transmitted to FedEx		
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1. FROM: *(Include ZIP Code)*

60 CES/CEA
411 AIRMEN DR.
TRAVIS AFB CA 94535-2001

SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4427893X007XXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*

KERN COUNTY APCD
2700 "M" STREET, SUITE 302
BAKERSFIELD, CA 93301-2370

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR

PHONE: 661-862-5250
KERN COUNTY APCD
2700 "M" STREET, SUITE 302
BAKERSFIELD, CA 93301-2370

12. DATE SHIPPED *(YYYYMMDD)*:

b. 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA AMOUNT

AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. X Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO

17. SPECIAL HANDLING

18. RECAPITULATION OF SHIPMENT

ISSUED BY: DOC

CHECKED BY: HSOLA 8193

PACKED BY:

TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
		TOTAL		

19. RECEIPT

	DATE *(YYYYMMDD)*	BY	
CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE *(YYYYMMDD)*	BY	GRAND TOTAL
POSTED	DATE *(YYYYMMDD)*	BY	20. RECEIVER'S VOUCHER NO.

1101

DD FORM 1149, APR 2000

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Tracking number	8137515635	**Reference**	FB44278193X007X XX	**Wrong Address?** Reduce future mistakes by using FedEx Address Checker.
Signed for by	T.FERDON			
Ship date	Jul 11, 2008			
Delivery date	Jul 14, 2008 10:24 AM	**Destination**	BAKERSFIELD, CA	Tracking a FedEx SmartPost Shipment? Go to shipper login
		Delivered to	Receptionist/Front Desk	
		Service type	Priority Overnight	
		Weight	4.0 lbs.	
Status	Delivered			
Signature image available	Yes			

Date/Time		Activity	Location	Details
Jul 14, 2008	10:24 AM	**Delivered**	BAKERSFIELD, CA	
	8:05 AM	On FedEx vehicle for delivery	BAKERSFIELD, CA	
	7:55 AM	At local FedEx facility	BAKERSFIELD, CA	
Jul 12, 2008	3:32 AM	At dest sort facility	ONTARIO, CA	
	2:20 AM	Departed FedEx location	OAKLAND, CA	
Jul 11, 2008	8:09 PM	Package data transmitted to FedEx		
	6:03 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	



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E-mail address	**Language**	**Exception updates**	**Delivery updates**
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	English	☐	☐
	English	☐	☐

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Fed Ex # 813751562 6

HIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

Form Approved
OMB No. 0704-0246
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1. FROM: *(Include ZIP Code)*
60 CES/CEA
411 AIRMEN DR.
TRAVIS AFB CA 94535-2001

SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4427893X008XXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*
MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT
14306 PARK AVE
VICTORVILLE, CA 92392

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR
PHONE: 760-245-1661
MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT
14306 PARK AVE
VICTORVILLE, CA 92392

12. DATE SHIPPED *(YYYYMMDD)*:

b.: 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA
AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. X Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO:

17. SPECIAL HANDLING:

18. RECAPITULATION OF SHIPMENT

ISSUED BY: Dave
CHECKED BY: HASOLA 8193
PACKED BY:

TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
		← TOTAL →		

19. RECEIPT

	DATE (YYYYMMDD)	BY	
CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE (YYYYMMDD)	BY	GRAND TOTAL
POSTED	DATE (YYYYMMDD)	BY	20. RECEIVER'S VOUCHER NO.

1101

DD FORM 1149, APR 2000

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Tracking number	8137515626	**Reference**	FB44278193X008X XX	**Wrong Address?** Reduce future mistakes by using FedEx Address Checker.
Signed for by	K.NOWAK			
Ship date	Jul 11, 2008			
Delivery date	Jul 14, 2008 9:58 AM	**Destination**	VICTORVILLE, CA	Tracking a FedEx SmartPost Shipment? Go to shipper login
		Delivered to	Receptionist/Front Desk	
		Service type	Priority Overnight	
		Weight	4.0 lbs.	
Status	Delivered			
Signature image available	Yes			

Date/Time		Activity	Location	Details
Jul 14, 2008	9:58 AM	**Delivered**	VICTORVILLE, CA	
	9:01 AM	On FedEx vehicle for delivery	VICTORVILLE, CA	
	8:22 AM	At local FedEx facility	VICTORVILLE, CA	
Jul 12, 2008	3:32 AM	At dest sort facility	ONTARIO, CA	
	2:20 AM	Departed FedEx location	OAKLAND, CA	
Jul 11, 2008	8:09 PM	Package data transmitted to FedEx		
	6:03 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	



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E-mail address	Language	Exception updates	Delivery updates
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	English	☐	☐
	English	☐	☐
	English	☐	☐

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SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

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411 AIRMEN DR.
TRAVIS AFB CA 94535-2001

SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4427 8193 X 009 XXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 COPLEY DR.
DIAMOND BAR, CA 91765

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR

PHONE: 909-396-2000
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 COPLEY DR.
DIAMOND BAR, CA 91765

12. DATE SHIPPED *(YYYYMMDD)*:

b. 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA

AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. X Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO

17. SPECIAL HANDLING

18. RECAPITULATION OF SHIPMENT

ISSUED BY	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
Joe					
CHECKED BY: HISOLA 9193					
PACKED BY					
			TOTAL		

110

19. RECEIPT

	DATE *(YYYYMMDD)*	BY	
CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE *(YYYYMMDD)*	BY	GRAND TOTAL
POSTED	DATE *(YYYYMMDD)*	BY	20. RECEIVER'S VOUCHER NO.

DD FORM 1149, APR 2000

61 62 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Tracking number	8137515617	**Reference**	FB44278193X009X XX	**Wrong Address?** Reduce future mistakes by using FedEx Address Checker.
Signed for by	B.GREEN			
Ship date	Jul 11, 2008			
Delivery date	Jul 14, 2008 8:46 AM	**Destination**	DIAMOND BAR, CA	Tracking a FedEx SmartPost Shipment? Go to shipper login
		Delivered to	Guard/Security Station	
		Service type	Priority Overnight	
		Weight	4.0 lbs.	
Status	Delivered			
Signature image available	Yes			



Date/Time		Activity	Location	Details
Jul 14, 2008	8:46 AM	**Delivered**	DIAMOND BAR, CA	
	7:07 AM	On FedEx vehicle for delivery	CITY OF INDUSTRY, CA	
	6:59 AM	At local FedEx facility	CITY OF INDUSTRY, CA	
Jul 12, 2008	12:54 PM	At dest sort facility	LOS ANGELES, CA	
	2:20 AM	Departed FedEx location	OAKLAND, CA	
Jul 11, 2008	8:09 PM	Package data transmitted to FedEx		
	6:03 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	

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SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

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411 AIRMEN DR.
TRAVIS AFB CA 94535-2001

SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4427808 3x 010XXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*
BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 ELLIS STREET
SAN FRANCISCO, CA 94109-7799

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR
PHONE: 415-771-6000
BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 ELLIS STREET
SAN FRANCISCO, CA 94109-7799

12. DATE SHIPPED *(YYYYMMDD)*:

b. 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA
AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. X Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO:

17. SPECIAL HANDLING:

18. RECAPITULATION OF SHIPMENT

ISSUED BY: Dan

CHECKED BY: ABSOLA 9193

PACKED BY:

TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
		TOTAL		

19. RECEIPT

	DATE *(YYYYMMDD)*	BY	
CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE *(YYYYMMDD)*	BY	GRAND TOTAL
POSTED	DATE *(YYYYMMDD)*	BY	20. RECEIVER'S VOUCHER NO.

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51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Tracking number	8137515601	**Reference**	FB44278193X010X XX	**Wrong Address?** Reduce future mistakes by using FedEx Address Checker.
Signed for by	B.COOPER			
Ship date	Jul 11, 2008			
Delivery date	Jul 14, 2008 8:44 AM	**Destination**	SAN FRANCISCO, CA	Tracking a FedEx SmartPost Shipment? Go to shipper login
		Delivered to	Receptionist/Front Desk	
		Service type	Priority Overnight	
		Weight	4.0 lbs.	
Status	Delivered			
Signature image available	Yes			



Date/Time		Activity	Location	Details
Jul 14, 2008	8:44 AM	**Delivered**	SAN FRANCISCO, CA	
	7:46 AM	On FedEx vehicle for delivery	SAN FRANCISCO, CA	
	6:35 AM	At local FedEx facility	SAN FRANCISCO, CA	
Jul 12, 2008	6:37 AM	Departed FedEx location	OAKLAND, CA	
Jul 11, 2008	9:13 PM	Arrived at FedEx location	OAKLAND, CA	
	8:09 PM	Package data transmitted to FedEx		
	7:56 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	

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E-mail address	**Language**	**Exception updates**	**Delivery updates**
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	English	☐	☐
	English	☐	☐

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REQUISITION AND INVOICE/SHIPPING DOCUMENT

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1. FROM: *(Include ZIP Code)*
60 CES/CEA
411 AIRMEN DR.
TRAVIS AFB CA 94535-2001

SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4427 8193 X011 XXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*
YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT
1947 GALILEO CT, SUITE 103
DAVIS, CA 95616

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR
PHONE: 530-757-3650
YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT
1947 GALILEO CT, SUITE 103
DAVIS, CA 95616

12. DATE SHIPPED *(YYYYMMDD)*:

b.: 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA: AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. X Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO:

17. SPECIAL HANDLING:

18. RECAPITULATION OF SHIPMENT

ISSUED BY	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
Doe					
CHECKED BY: HILO LA 96720					
PACKED BY					
			TOTAL		

1101

19. RECEIPT

	DATE (YYYYMMDD)	BY	SHEET TOTAL
CONTAINERS RECEIVED EXCEPT AS NOTED			
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE (YYYYMMDD)	BY	GRAND TOTAL
POSTED	DATE (YYYYMMDD)	BY	20. RECEIVER'S VOUCHER NO.

DD FORM 1149, APR 2000

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Tracking number	8137515592	**Reference**	FB44278193X011X XX	**Wrong Address?** Reduce future mistakes by using FedEx Address Checker.
Signed for by	H.CHAMBERS			
Ship date	Jul 11, 2008			
Delivery date	Jul 14, 2008 9:59 AM	**Destination**	DAVIS, CA	Tracking a FedEx SmartPost Shipment? Go to shipper login
		Delivered to	Receptionist/Front Desk	
		Service type	Priority Overnight	
		Weight	4.0 lbs.	
Status	Delivered			
Signature image available	Yes			

Date/Time		Activity	Location	Details
Jul 14, 2008	9:59 AM	**Delivered**	DAVIS, CA	
	8:00 AM	On FedEx vehicle for delivery	SACRAMENTO, CA	
	7:52 AM	At local FedEx facility	SACRAMENTO, CA	
Jul 11, 2008	8:09 PM	Package data transmitted to FedEx		
	6:03 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	



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	English	☐	☐
	English	☐	☐
	English	☐	☐

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REQUISITION AND INVOICE/SHIPPING DOCUMENT

Form Approved
OMB No. 0704-0246
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1. FROM: *(Include ZIP Code)*
60 CES/CEA
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TRAVIS AFB CA 94535-2001

SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4427S193X012XXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*
ANTELOPE VALLEY AIR QUALITY MANAGEMENT DISTRICT
43301 DIVISION STREET, SUITE 206
LANCASTER, CA 93535

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR
PHONE: 661-723-8070
ANTELOPE VALLEY AIR QUALITY MANAGEMENT DISTRICT
43301 DIVISION STREET, SUITE 206
LANCASTER, CA 93535

12. DATE SHIPPED *(YYYYMMDD)*:

b. 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA
AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. X Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO

17. SPECIAL HANDLING

18. RECAPITULATION OF SHIPMENT		TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
	ISSUED BY: Doc					
	CHECKED BY: HILOLA 6193					
	PACKED BY:					
				TOTAL		

1101

19. RECEIPT

	DATE *(YYYYMMDD)*	BY	SHEET TOTAL
CONTAINERS RECEIVED EXCEPT AS NOTED			
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE *(YYYYMMDD)*	BY	GRAND TOTAL
POSTED	DATE *(YYYYMMDD)*	BY	20. RECEIVER'S VOUCHER NO.

DD FORM 1149, APR 2000

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Tracking number	8137515583	**Reference**	FB44278193X012X XX	**Wrong Address?** Reduce future mistakes by using FedEx Address Checker.
Signed for by	C.BATES			
Ship date	Jul 11, 2008			
Delivery date	Jul 14, 2008 8:30 AM	**Destination**	LANCASTER, CA	Tracking a FedEx SmartPost Shipment? Go to shipper login
		Delivered to	Receptionist/Front Desk	
		Service type	Priority Overnight	
		Weight	4.0 lbs.	
Status	Delivered			
Signature image available	Yes			



Date/Time		Activity	Location	Details
Jul 14, 2008	8:30 AM	**Delivered**	LANCASTER, CA	
	7:58 AM	On FedEx vehicle for delivery	LANCASTER, CA	
	7:51 AM	At local FedEx facility	LANCASTER, CA	
Jul 12, 2008	2:20 AM	Departed FedEx location	OAKLAND, CA	
Jul 11, 2008	8:09 PM	Package data transmitted to FedEx		
	6:03 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	

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	English	☐	☐
	English	☐	☐
	English	☐	☐

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REQUISITION AND INVOICE/SHIPPING DOCUMENT

Form Approved
OMB No. 0704-0246
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TRAVIS AFB CA 94535-2001

SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4487 8193 X013 XXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*
CALIFORNIA DEPT OF FISH & GAME
1416 9TH ST.
SACRAMENTO, CA 95814

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR
PHONE: 916-445-0411
CALIFORNIA DEPT OF FISH & GAME
1416 9TH ST.
SACRAMENTO, CA 95814

12. DATE SHIPPED *(YYYYMMDD)*:

b. 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA
AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. X Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO:

17. SPECIAL HANDLING:

18. RECAPITULATION OF SHIPMENT

ISSUED BY	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
CHECKED BY: HSOLA 8193					
PACKED BY					
			← TOTAL →		

1101

19. RECEIPT

CONTAINERS RECEIVED EXCEPT AS NOTED	DATE (YYYYMMDD)	BY	SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE (YYYYMMDD)	BY	GRAND TOTAL
POSTED	DATE (YYYYMMDD)	BY	20. RECEIVER'S VOUCHER NO.

DD FORM 1149, APR 2000

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Tracking number	8137515574	**Reference**	FB44278193X013X XX	**Wrong Address?** Reduce future mistakes by using FedEx Address Checker.
Signed for by	C.HOWELL			
Ship date	Jul 11, 2008			
Delivery date	Jul 14, 2008 9:14 AM	**Destination**	SACRAMENTO, CA	Tracking a FedEx SmartPost Shipment? Go to shipper login
		Delivered to	Receptionist/Front Desk	
		Service type	Priority Overnight	
		Weight	4.0 lbs.	
Status	Delivered			
Signature image available	Yes			

Date/Time		Activity	Location	Details
Jul 14, 2008	9:14 AM	**Delivered**	SACRAMENTO, CA	
	8:01 AM	On FedEx vehicle for delivery	SACRAMENTO, CA	
	7:52 AM	At local FedEx facility	SACRAMENTO, CA	
Jul 11, 2008	8:09 PM	Package data transmitted to FedEx		
	6:03 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	



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E-mail address	Language	Exception updates	Delivery updates
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	English	☐	☐
	English	☐	☐
	English	☐	☐

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REQUISITION AND INVOICE/SHIPPING DOCUMENT

Form Approved
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TRAVIS AFB CA 94535-2001

SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4127 8193 X014 XXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*
CALIFORNIA AIR RESOURCES BOARD
1001 "I" STREET
SACRAMENTO, CA 95812

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR
PHONE: AIR QUALITY & TRANSPORTATION DIVISION, 916-322-2886
CALIFORNIA AIR RESOURCES BOARD
1001 "I" STREET
SACRAMENTO, CA 95812

12. DATE SHIPPED *(YYYYMMDD)*:

b. 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA
AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. x Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO

17. SPECIAL HANDLING

18. RECAPITULATION OF SHIPMENT

ISSUED BY	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
CHECKED BY: HISOLA 8193					
PACKED BY					
			← TOTAL →		

19. RECEIPT

CONTAINERS RECEIVED EXCEPT AS NOTED	DATE *(YYYYMMDD)*	BY	SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE *(YYYYMMDD)*	BY	GRAND TOTAL
POSTED	DATE *(YYYYMMDD)*	BY	20. RECEIVER'S VOUCHER NO.

11d

DD FORM 1149, APR 2000

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Detailed Results

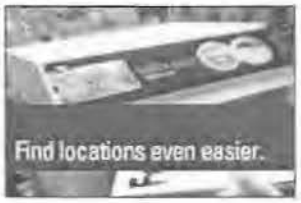
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Select another track: 8137515565 Previous | Next

Tracking number	8137515565	**Reference**	FB44278193X014X XX
Signed for by	J.ROA		
Ship date	Jul 11, 2008		
Delivery date	Jul 14, 2008 8:32 AM	**Destination**	SACRAMENTO, CA
		Delivered to	Shipping/Receiving
		Service type	Priority Overnight
		Weight	4.0 lbs.
Status	Delivered		
Signature image available	Yes		

Wrong Address?
Reduce future mistakes by using FedEx Address Checker.

Tracking a FedEx SmartPost Shipment?
Go to shipper login



Date/Time		Activity	Location	Details
Jul 14, 2008	8:32 AM	**Delivered**	SACRAMENTO, CA	
	7:59 AM	On FedEx vehicle for delivery	SACRAMENTO, CA	
	7:50 AM	At local FedEx facility	SACRAMENTO, CA	
Jul 11, 2008	8:09 PM	Package data transmitted to FedEx		
	6:03 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	

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	English	☐	☐
	English	☐	☐
	English	☐	☐

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SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

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60 CES/CEA
411 AIRMEN DR.
TRAVIS AFB CA 94535-2001

SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4427 8193 x015 XX1

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*
AIR FORCE WESTERN REGIONAL ENVIRONMENTAL OFFICE, AFCEE/CCR-S
50 FREMONT ST., SUITE 2450
SAN FRANCISCO, CA 94105

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR
ATTN: MR. GARY MUNSTERMAN, 415-977-8884
AIR FORCE WESTERN REGIONAL ENVIRONMENTAL OFFICE, AFCEE/CCR-S
50 FREMONT ST., SUITE 2450
SAN FRANCISCO, CA 94105

12. DATE SHIPPED *(YYYYMMDD)*:

b.: 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA
AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. x Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO:

17. SPECIAL HANDLING:

18. RECAPITULATION OF SHIPMENT

ISSUED BY	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
Dan					
CHECKED BY HISDLA 8193					
PACKED BY					
			← TOTAL →		

1101

19. RECEIPT

CONTAINERS RECEIVED EXCEPT AS NOTED	DATE (YYYYMMDD)	BY	SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE (YYYYMMDD)	BY	GRAND TOTAL
POSTED	DATE (YYYYMMDD)	BY	20. RECEIVER'S VOUCHER NO.

DD FORM 1149, APR 2000

61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Tracking number	8137515714	**Reference**	FB44278193X015X XX	**Wrong Address?** Reduce future mistakes by using FedEx Address Checker.
Signed for by	F.CASTILLO			
Ship date	Jul 11, 2008			
Delivery date	Jul 14, 2008 9:31 AM	**Destination**	SAN FRANCISCO, CA	Tracking a FedEx SmartPost Shipment? Go to shipper login
		Delivered to	Receptionist/Front Desk	
		Service type	Priority Overnight	
		Weight	4.0 lbs.	
Status	Delivered			
Signature image available	Yes			

Date/Time		Activity	Location	Details
Jul 14, 2008	9:31 AM	**Delivered**	SAN FRANCISCO, CA	
	7:00 AM	On FedEx vehicle for delivery	SAN FRANCISCO, CA	
Jul 12, 2008	6:37 AM	Departed FedEx location	OAKLAND, CA	
Jul 11, 2008	9:13 PM	Arrived at FedEx location	OAKLAND, CA	
	8:09 PM	Package data transmitted to FedEx		
	7:56 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	



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E-mail address	Language	Exception updates	Delivery updates
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	English	☐	☐
	English	☐	☐
	English	☐	☐

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411 AIRMEN DR.
TRAVIS AFB CA 94535-2001

2. TO: *(Include ZIP Code)*
AFF AWP-910
1500 AVIATION BLVD
HAWTHORNE, CA 90250

3. SHIP TO - MARK FOR
PHONE: 310-725-3901
AFF AWP-910
1500 AVIATION BLVD
HAWTHORNE, CA 90250

SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4H278193XQ16XXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

12. DATE SHIPPED *(YYYYMMDD)*:

b.: 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA: AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. x Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO:

17. SPECIAL HANDLING:

18. RECAPITULATION OF SHIPMENT

ISSUED BY	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
Doc					
CHECKED BY HSDLA 9193					
PACKED BY					
			← TOTAL →		

19. RECEIPT

	DATE (YYYYMMDD)	BY	
CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED			GRAND TOTAL
POSTED			20. RECEIVER'S VOUCHER NO.

110

DD FORM 1149, APR 2000

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Tracking number	8137515723	**Reference**	FB44278193X016XXX	**Wrong Address?** Reduce future mistakes by using FedEx Address Checker.
Signed for by	W.LEWIS			
Ship date	Jul 11, 2008			
Delivery date	Jul 14, 2008 10:58 AM	**Destination**	HAWTHORNE, CA	Tracking a FedEx SmartPost Shipment? Go to shipper login
		Delivered to	Shipping/Receiving	
		Service type	Priority Overnight	
		Weight	4.0 lbs.	
Status	Delivered			
Signature image available	Yes			

Date/Time		Activity	Location	Details
Jul 14, 2008	10:58 AM	**Delivered**	HAWTHORNE, CA	
	10:10 AM	Delivery exception	HAWTHORNE, CA	Incorrect address
	9:34 AM	On FedEx vehicle for delivery	HAWTHORNE, CA	
	6:38 AM	At local FedEx facility	HAWTHORNE, CA	
Jul 12, 2008	12:54 PM	At dest sort facility	LOS ANGELES, CA	
	2:20 AM	Departed FedEx location	OAKLAND, CA	
Jul 11, 2008	8:09 PM	Package data transmitted to FedEx		
	6:03 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	



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E-mail address	Language	Exception updates	Delivery updates
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	English	☐	☐
	English	☐	☐

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411 AIRMEN DR.
TRAVIS AFB CA 94535-2001

SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4427S193X017XXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*

DEPT OF PARKS & RECREATION
1416 9TH ST.
SACRAMENTO, CA 95814

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR

PHONE: STATE HISTORIC PRESERVATION OFFICER, 916-653-6624
DEPT OF PARKS & RECREATION
1416 9TH ST.
SACRAMENTO, CA 95814

12. DATE SHIPPED *(YYYYMMDD)*:

b. 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA

AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. X Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO:

17. SPECIAL HANDLING:

18. RECAPITULATION OF SHIPMENT	ISSUED BY	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
	CHECKED BY: HISOLA 9193					
	PACKED BY					
				← TOTAL →		

1101

19. RECEIPT				
	CONTAINERS RECEIVED EXCEPT AS NOTED	DATE *(YYYYMMDD)*	BY	SHEET TOTAL
	QUANTITIES RECEIVED EXCEPT AS NOTED	DATE *(YYYYMMDD)*	BY	GRAND TOTAL
	POSTED	DATE *(YYYYMMDD)*	BY	20. RECEIVER'S VOUCHER NO.

DD FORM 1149, APR 2000

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Tracking number	8137515766	**Reference**	FB44278193X017XXX	**Wrong Address?** Reduce future mistakes by using FedEx Address Checker.
Signed for by	K.FREEMAN			
Ship date	Jul 11, 2008			
Delivery date	Jul 14, 2008 9:07 AM	**Destination**	SACRAMENTO, CA	Tracking a FedEx SmartPost Shipment? Go to shipper login
		Delivered to	Mailroom	
		Service type	Priority Overnight	
		Weight	4.0 lbs.	
Status	Delivered			
Signature image available	Yes			



Date/Time		Activity	Location	Details
Jul 14, 2008	9:07 AM	**Delivered**	SACRAMENTO, CA	
	8:02 AM	On FedEx vehicle for delivery	SACRAMENTO, CA	
	7:52 AM	At local FedEx facility	SACRAMENTO, CA	
Jul 11, 2008	8:09 PM	Package data transmitted to FedEx		
	6:03 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	

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	English	☐	☐
	English	☐	☐
	English	☐	☐

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TRAVIS AFB CA 94535-2001

SHEET NO. | NO. OF SHEETS | 5. REQUISITION DATE: 20080711 | 6. REQUISITION NUMBER: FB4427 8193 X018 XXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY

2. TO: *(Include ZIP Code)*
US Forest Service, Ecosystem Planning, Pacific Southwest Region
1323 Club Dr
Vallejo, CA 94592

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR
ATTN: Ms Kathy Clement, 707-562-8737
US Forest Service, Ecosystem Planning, Pacific Southwest Region
1323 Club Dr
Vallejo, CA 94592

12. DATE SHIPPED *(YYYYMMDD)*

b. 4-3739

13. MODE OF SHIPMENT

14. BILL OF LADING NUMBER

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.

4. APPROPRIATIONS DATA
AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. x Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO

17. SPECIAL HANDLING

18. RECAPITULATION OF SHIPMENT	ISSUED BY	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
	Sue					
	CHECKED BY: HISDLA 9193					
	PACKED BY					
				← TOTAL →		

1101

19. RECEIPT			
CONTAINERS RECEIVED EXCEPT AS NOTED	DATE *(YYYYMMDD)*	BY	SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE *(YYYYMMDD)*	BY	GRAND TOTAL
POSTED	DATE *(YYYYMMDD)*	BY	20. RECEIVER'S VOUCHER NO.

DD FORM 1149, APR 2000

61 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Tracking number	8137515784	**Reference**	FB44278193X018XXX
Signed for by	S.CAMERON		
Ship date	Jul 11, 2008		
Delivery date	Jul 14, 2008 10:27 AM	**Destination**	VALLEJO, CA
		Delivered to	Shipping/Receiving
		Service type	Priority Overnight
		Weight	4.0 lbs.
Status	Delivered		
Signature image available	Yes		

Wrong Address?
Reduce future mistakes by using FedEx Address Checker.

Tracking a FedEx SmartPost Shipment?
Go to shipper login



Date/Time		Activity	Location	Details
Jul 14, 2008	10:27 AM	**Delivered**	VALLEJO, CA	
	7:55 AM	On FedEx vehicle for delivery	PACHECO, CA	
	7:15 AM	At local FedEx facility	PACHECO, CA	
Jul 12, 2008	6:36 AM	Departed FedEx location	OAKLAND, CA	
Jul 11, 2008	9:13 PM	Arrived at FedEx location	OAKLAND, CA	
	8:09 PM	Package data transmitted to FedEx		
	7:56 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	

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E-mail address	**Language**	**Exception updates**	**Delivery updates**
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	English	☐	☐
	English	☐	☐

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TRAVIS AFB CA 94535-2001

SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4427 8193 X 019 XXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*

DEPARTMENT OF THE INTERIOR, OFFICE OF ENVIRO POLICY & COMPLIANCE
1111 JACKSON ST, SUITE 520
OAKLAND, CA 94607

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR

ATTN: MS PATRICIA PORT, 510-817-1477
DEPARTMENT OF THE INTERIOR, OFFICE OF ENVIRO POLICY & COMPLIANCE
1111 JACKSON ST, SUITE 520
OAKLAND, CA 94607

12. DATE SHIPPED *(YYYYMMDD)*:

b. 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA

AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. x Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO:

17. SPECIAL HANDLING:

18. RECAPITULATION OF SHIPMENT

ISSUED BY	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
Joe					
CHECKED BY: HISDLA 8193					
PACKED BY					
			TOTAL		

1101

19. RECEIPT

	DATE *(YYYYMMDD)*	BY	
CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE *(YYYYMMDD)*	BY	GRAND TOTAL
POSTED	DATE *(YYYYMMDD)*	BY	20. RECEIVER'S VOUCHER NO.

DD FORM 1149, APR 2000

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Tracking number	8137515793	**Reference**	FB44278193X019X XX	**Wrong Address?** Reduce future mistakes by using FedEx Address Checker.
Signed for by	R.ROMERO			
Ship date	Jul 11, 2008			
Delivery date	Jul 14, 2008 9:45 AM	**Destination**	OAKLAND, CA	Tracking a FedEx SmartPost Shipment? Go to shipper login
		Delivered to	Receptionist/Front Desk	
		Service type	Priority Overnight	
		Weight	4.0 lbs.	
Status	Delivered			
Signature image available	Yes			



Date/Time		Activity	Location	Details
Jul 14, 2008	9:45 AM	**Delivered**	OAKLAND, CA	
	7:11 AM	On FedEx vehicle for delivery	EMERYVILLE, CA	
	7:04 AM	At local FedEx facility	EMERYVILLE, CA	
Jul 12, 2008	7:00 AM	Departed FedEx location	OAKLAND, CA	
Jul 11, 2008	9:13 PM	Arrived at FedEx location	OAKLAND, CA	
	8:09 PM	Package data transmitted to FedEx		
	7:56 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	

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411 AIRMEN DR.
TRAVIS AFB CA 94535-2001

SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4427 8193 x020 xxx

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*

FEDERAL AVIATION ADMINISTRATION
831 MITTEN ROAD, ROOM 210
BURLINGAME, CA 94010

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR

Attn: ATTN: MR. JOE RODRIQUEZ, 650-876-2771
FEDERAL AVIATION ADMINISTRATION
PLANNING AND PROGRAMMING
831 MITTEN ROAD, ROOM 210
BURLINGAME, CA 94010

12. DATE SHIPPED *(YYYYMMDD)*:

b.: 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA

AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. x Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO:

17. SPECIAL HANDLING:

18. RECAPITULATION OF SHIPMENT

ISSUED BY: Joe

CHECKED BY: HSDCA 9193

PACKED BY:

TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
		← TOTAL →		

19. RECEIPT

	DATE (YYYYMMDD)	BY	
CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE (YYYYMMDD)	BY	GRAND TOTAL
POSTED	DATE (YYYYMMDD)	BY	20. RECEIVER'S VOUCHER NO.

(101)

DD FORM 1149, APR 2000

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Tracking number	8137515802	**Reference**	FB44278193X020X XX	**Wrong Address?** Reduce future mistakes by using FedEx Address Checker.
Signed for by	J.CAMARAO			
Ship date	Jul 11, 2008			
Delivery date	Jul 14, 2008 9:49 AM	**Destination**	BURLINGAME, CA	Tracking a FedEx SmartPost Shipment? Go to shipper login
		Delivered to	Receptionist/Front Desk	
		Service type	Priority Overnight	
		Weight	4.0 lbs.	
Status	Delivered			
Signature image available	Yes			

Date/Time		Activity	Location	Details
Jul 14, 2008	9:49 AM	**Delivered**	BURLINGAME, CA	
	7:08 AM	On FedEx vehicle for delivery	SOUTH SAN FRANCISCO, CA	
	7:00 AM	At local FedEx facility	SOUTH SAN FRANCISCO, CA	
Jul 12, 2008	6:52 AM	Departed FedEx location	OAKLAND, CA	
Jul 11, 2008	9:13 PM	Arrived at FedEx location	OAKLAND, CA	
	8:09 PM	Package data transmitted to FedEx		
	7:56 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	



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	English	☐	☐
	English	☐	☐

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1. FROM: *(Include ZIP Code)*
60 CES/CEA
411 AIRMEN DR.
TRAVIS AFB CA 94535-2001

SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4427 8193 X021 XXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*
US FISH & WILDLIFE SERVICE
2800 COTTAGE WAY, SUITE 2605
SACRAMENTO, CA 95825

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR
Attn: US DEPARTMENT OF INTERIOR, 916-414-6600
US FISH & WILDLIFE SERVICE
2800 COTTAGE WAY, SUITE W2605
SACRAMENTO, CA 95825

12. DATE SHIPPED *(YYYYMMDD)*:

b. 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA
AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. X Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO:

17. SPECIAL HANDLING:

18. RECAPITULATION OF SHIPMENT

ISSUED BY: Doc

CHECKED BY: HISDLA 8193

PACKED BY:

TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
		← TOTAL →		

19. RECEIPT

	DATE *(YYYYMMDD)*	BY	SHEET TOTAL
CONTAINERS RECEIVED EXCEPT AS NOTED			
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE *(YYYYMMDD)*	BY	GRAND TOTAL
POSTED	DATE *(YYYYMMDD)*	BY	20. RECEIVER'S VOUCHER NO.

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61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Tracking number	8137515827	**Reference**	FB44278193X021X XX	**Wrong Address?** Reduce future mistakes by using FedEx Address Checker.
Signed for by	R.HARPER			
Ship date	Jul 11, 2008			
Delivery date	Jul 14, 2008 10:13 AM	**Destination**	SACRAMENTO, CA	Tracking a FedEx SmartPost Shipment? Go to shipper login
		Delivered to	Mailroom	
		Service type	Priority Overnight	
		Weight	4.0 lbs.	
Status	Delivered			
Signature image available	Yes			

Date/Time		Activity	Location	Details
Jul 14, 2008	10:13 AM	**Delivered**	SACRAMENTO, CA	
	7:26 AM	On FedEx vehicle for delivery	RANCHO CORDOVA, CA	
	6:49 AM	At local FedEx facility	RANCHO CORDOVA, CA	
Jul 12, 2008	6:12 AM	At dest sort facility	SACRAMENTO, CA	
	2:40 AM	Departed FedEx location	OAKLAND, CA	
Jul 11, 2008	8:09 PM	Package data transmitted to FedEx		
	2:32 PM	Picked up	PACHECO, CA	



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	English	☐	☐
	English	☐	☐
	English	☐	☐

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SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4827S193X022XXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (US EPA)
75 HAWTHORNE ST, REGION 9
SAN FRANCISCO, CA 94105

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR
Attn: 415-947-8021
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (US EPA)
75 HAWTHORNE ST
SAN FRANCISCO, CA 94105

12. DATE SHIPPED *(YYYYMMDD)*:

b. 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER:

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA
AA 5783400 308 65TT 3A4404 020000 46200 41879F 667100 F67100, Mord # F3Z3457288M002

AMOUNT:

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
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16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO:

17. SPECIAL HANDLING:

18. RECAPITULATION OF SHIPMENT

ISSUED BY	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
Joe					
CHECKED BY: HIXOLA (101)					
PACKED BY					
			TOTAL		

8193

19. RECEIPT

	DATE *(YYYYMMDD)*	BY	
CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED			GRAND TOTAL
POSTED			20. RECEIVER'S VOUCHER NO.

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Signed for by	A.GODWIN			
Ship date	Jul 11, 2008			
Delivery date	Jul 14, 2008 8:37 AM	**Destination**	SAN FRANCISCO, CA	Tracking a FedEx SmartPost Shipment? Go to shipper login
		Delivered to	Mailroom	
		Service type	Priority Overnight	
		Weight	4.0 lbs.	
Status	Delivered			
Signature image available	Yes			

Date/Time		Activity	Location	Details
Jul 14, 2008	8:37 AM	**Delivered**	SAN FRANCISCO, CA	
	7:32 AM	On FedEx vehicle for delivery	SAN FRANCISCO, CA	
	6:56 AM	At local FedEx facility	SAN FRANCISCO, CA	
Jul 12, 2008	6:37 AM	Departed FedEx location	OAKLAND, CA	
Jul 11, 2008	9:13 PM	Arrived at FedEx location	OAKLAND, CA	
	8:09 PM	Package data transmitted to FedEx		
	7:56 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	



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TRAVIS AFB CA 94535-2001

SHEET NO.	NO. OF SHEETS	5. REQUISITION DATE	6. REQUISITION NUMBER
		20080711	FB4487 8193 X 023 XXX

7. DATE MATERIAL REQUIRED *(YYYYMMDD)*: 20080714

8. PRIORITY:

2. TO: *(Include ZIP Code)*

SOLANO COUNTY DEPT OF RESOURCE MANAGEMENT
675 TEXAS STREET SUITE 5500
FAIRFIELD CA 94533

9. AUTHORITY OR PURPOSE: TO AVOID SERIOUS PENALTIES

10. SIGNATURE: Shery Cassidy

11a. VOUCHER NUMBER & DATE *(YYYYMMDD)*: SHERY CASSIDY

3. SHIP TO - MARK FOR

Attn: (707) 427-5104
SOLANO COUNTY DEPT OF RESOURCE MANAGEMENT
675 TEXAS STREET SUITE 5500
FAIRFIELD CA 94533

12. DATE SHIPPED *(YYYYMMDD)*:

b. 4-3739

13. MODE OF SHIPMENT:

14. BILL OF LADING NUMBER: 8000718494

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.:

4. APPROPRIATIONS DATA

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1	Booklet THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE OR HAZARDOUS MATERIAL. X Shery Cassidy							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO

17. SPECIAL HANDLING

18. RECAPITULATION OF SHIPMENT	ISSUED BY	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
	Dac					
	CHECKED BY: HLSOLA 8193					
	PACKED BY					
				TOTAL		

19. RECEIPT				
	CONTAINERS RECEIVED EXCEPT AS NOTED	DATE *(YYYYMMDD)*	BY	SHEET TOTAL
	QUANTITIES RECEIVED EXCEPT AS NOTED	DATE *(YYYYMMDD)*	BY	GRAND TOTAL
	POSTED	DATE *(YYYYMMDD)*	BY	20. RECEIVER'S VOUCHER NO.

1107

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Tracking number	8137515696	**Reference**	FB44278193X023X XX
Signed for by	R.JAMES		
Ship date	Jul 11, 2008		
Delivery date	Jul 14, 2008 9:15 AM	**Destination**	FAIRFIELD, CA
		Delivered to	Receptionist/Front Desk
		Service type	Priority Overnight
		Weight	4.0 lbs.
Status	Delivered		
Signature image available	Yes		

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Date/Time		Activity	Location	Details
Jul 14, 2008	9:15 AM	**Delivered**	FAIRFIELD, CA	
	7:24 AM	On FedEx vehicle for delivery	PACHECO, CA	
	7:18 AM	At local FedEx facility	PACHECO, CA	
Jul 12, 2008	6:36 AM	Departed FedEx location	OAKLAND, CA	
Jul 11, 2008	9:13 PM	Arrived at FedEx location	OAKLAND, CA	
	8:09 PM	Package data transmitted to FedEx		
	7:56 PM	Left FedEx origin facility	PACHECO, CA	
	2:32 PM	Picked up	PACHECO, CA	

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Mojave Desert Air Quality Management District
14306 Park Avenue, Victorville, CA 92392-2310
760.245.1661 • fax 760.245.2699
Visit our web site: http://www.mdaqmd.ca.gov
Eldon Heaston, Executive Director

Tuesday, July 22, 2008

Mr. Doug Allbright
HQ AMC/A7PI
507 Symington Drive
Scott AFB, IL 62225

Permanent Western United States C-17 Landing Zone

Dear Mr. Allbright:

The Mojave Desert Air Quality Management District has received the Draft Environmental Assessment for the Permanent Western United States C-17 Landing Zone. This project proposes establishment of C-17 Landing Zones (LZs) for aircraft operations on a permanent basis in the western United States. The proposed LZs would allow C-17 aircraft from Travis Air Force Base to conduct required day and night training. This project has a Southern California Logistics Airport (SCLA) Alternative which is a 3,500 foot-long, 90 foot-wide Landing Zone (LZ) with associated day/night LZ markings and an IR lighting system.

We have reviewed the project and, based on the information available to us at this time, we have no comments.

Thank you for the opportunity to review this planning document. If you have any questions regarding this letter, please contact me at (760) 245-1661, extension 6726, or Tracy Walters at extension 6122.

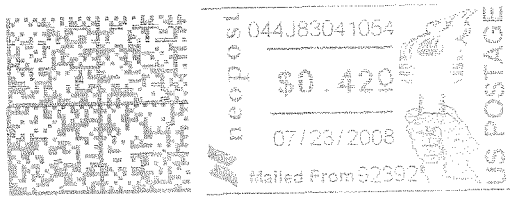
Sincerely,

Alan J. De Salvio
Supervising Air Quality Engineer

TW/AJD Dept of AF Perm C-17 LZ

MOJAVE
air quality management district
DESERT

14306 Park Avenue
Victorville, CA 92392



92225+5022 0000

DEPARTMENT OF TRANSPORTATION
DIVISION OF AERONAUTICS – M.S.#40
1120 N STREET
P. O. BOX 942873
SACRAMENTO, CA 94273-0001
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JUL 30 2008

July 21, 2008

Mr. Rudy Pontemayor
United States Air Force
60th Air Mobility Wing
411 Airmen Drive
Travis AFB, CA 94535

Dear Mr. Pontemayor:

The Department of the Air Force's Draft Environmental Assessment, Permanent C-17 Landing Zone in the Southwestern United States; SCH# 2008074001

The California Department of Transportation (Caltrans), Division of Aeronautics (Division), reviewed the above-referenced document with respect to airport-related noise and safety impacts and regional aviation land use planning issues pursuant to the California Environmental Quality Act (CEQA). The Division has technical expertise in the areas of airport operations safety and airport land use compatibility.

The proposed action would be the construction of a 3,500-foot long, 90-foot wide C-17 Landing Zone (LZ) with associated day or night LZ markings and an infrared lighting system for night vision goggle operations on the Travis Air Force Base (AFB) airfield in Solano County. Travis AFB aircrews will also use the existing LZ at the Grant County Airport at Moses Lake in Washington State. The Air Force will base 13 C-17 aircraft at Travis AFB. The Air Force anticipates approximately 23 average daily operations occurring at Travis AFB and one daily operation occurring at the Grant County Airport. The alternative location for the California LZ is Southern California Logistics Airport (SCLA) in San Bernardino County.

The Division previously commented on this proposal in the enclosed letter dated March 29, 2007. The Draft Environmental Assessment (EA) appears to very thorough in addressing the proposal's potential airport-related noise and safety impacts.

In accordance with the California Code of Regulations, Title 21, Section 3533, Travis AFB is exempt from the State airport permit requirements. SCLA, however, operates with a State permit issued by the Division. A new runway at SCLA will require an amended State airport permit. Information regarding the airport permit process can be viewed on-line at http://www.dot.ca.gov/hq/planning/aeronaut/airportpermit.html.

These comments reflect the areas of concern to the Division with respect to airport-related noise and safety impacts and regional airport land use planning issues. We advise you to contact our Caltrans district offices concerning surface transportation issues.

Thank you for the opportunity to review and comment on this proposal. If you have any questions, please call me at (916) 654-5314.

Sincerely,

Sandy Hesnard

SANDY HESNARD
Aviation Environmental Specialist

Enclosure

c: State Clearinghouse, Solano County ALUC, City of Victorville, SCLA

State of California - The Resources Agency ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF FISH AND GAME

http://www.dfg.ca.gov
Inland Deserts Region (IDR)
407 West Line Street
Bishop, CA 93514
(760) 872-1171
(760) 872-1284-Fax

August 14, 2008

Mr. Rudy Pontemayor
Unites States Air Force
411 Airmen Drive
Travis AFB, CA 94535

Subject: Comments on Draft Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for Permanent Western United States C-17 Landing Zone
State Clearinghouse # 2008074001

Dear Mr. Pontemayor:

The Department of Fish and Game (Department) has reviewed the EA and FONSI. The proposed project would make provisions for a series of permanent C-17 Landing Zones, one location at Travis AFB, Fairfield California and another at the Southern California Logistics Airfield (SCLA), Victorville, California. The scope of the SCLA site can not be clearly distinguished from those operations and associated project minimization measures for the Travis AFB. As submitted, the environmental documentation is insufficient for the Department's CEQA review purposes.

The Department is providing comments on the EA/FONSI as the State agency which has statutory and common law responsibilities with regard to fish and wildlife resources and habitats. California's fish and wildlife resources, including their habitats, are held in trust for the people of the State by the Department (Fish and Game Code §711.7). The Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitats necessary for biologically sustainable populations of those species (Fish and Game Code §1802). The Department's Fish and wildlife management functions are implemented through its administration and enforcement of Fish and Game Code (Fish and Game Code §702). The Department is a trustee agency for fish and wildlife under the California Environmental Quality Act (see CEQA Guidelines, 14 Cal. Code Regs. §15386(a)). The Department is providing these comments in furtherance of these statutory responsibilities, as well as its common law role as trustee for the public's fish and wildlife.

In this letter, the Department is providing comments in context of the SCLA project site in particular.

Line 37-42 Page 5
As identified in the EA/FONSI on page five, "No special status species would be affected. The distribution and life history descriptions for the desert tortoise and Mojave ground squirrel suggest that the occurrence of these species at the SCLA would be highly unlikely."

The proposed project is well within the range, both historically and currently, of the desert tortoise. The Department has records that reflect presence of the desert tortoise within the SCLA property. The proposed project site is located within the range of the Mohave ground squirrel (MGS); however, protocol surveys for MGS were not performed. Please reference lines 23-28, page 3-65 of the EA/FONSI.

Line 33 Page 1-6

The EA/FONSI identifies negotiations with Grant County and the Washington State Department of Natural Resources. Negotiations with the Washington State Department of Natural Resources has indicated "...no record of rare plants or high quality eco-systems at the airport."

This section of the document needs updating to reflect the current project.

Line 1 Page 2-11

Alternative 1 (later identified as the "preferred alternative [line 15-17, page 2-11]") would require the acquisition of "Approximately 37 acres of land that possibly has one federally listed endangered species, or would provide habitat for the species, would be affected" (page 2-11).

This document should address the extent of affects and appropriate actions.

Pages 2-23 through 2-34

The construction/contractor conditions as well as the conservation and minimization measures apply, from what is evident, solely to the Travis AFB and the California tiger salamander. The Department was unable to distinguish any measures designed or otherwise committed for the SCLA project site.

Page 2-44 and Appendix D

The EA/FONSI states "No mitigation would be required to reduce the impacts for aircraft operations and safety and BASH, noise, land use, air quality (i.e., Proposed Action at the Grant County Airport and the SCLA Alternative at any of the three airfields), or cultural resources to less than significant."

Since surveys for the SCLA site has not been provided, the Department can not concur with these conclusions as there is a federally listed species (desert tortoise) at the SCLA site.

The last paragraph under section **2.6 Mitigation** goes on to say that "The Air Force conducted Section 7 ESA consultation with the USFWS [United States Fish and Wildlife Service] Sacramento Ecological Services Field Office for impacts of the proposed action on special status species and habitats. The process is summarized in subchapter 1.3 and Appendix D contains the BA and BO associated with the project as well as a summary of the history of consultation. Subchapter 2.2.2.3 details the conservation and minimization measures associated with the Proposed Action at Travis AFB."

The information provided within the EA/FONSI does indicate that the USFWS was consulted for the proposed project at Travis AFB. However, the consultation did not include the SCLA site, nor does it include consultation with the USFWS

for the federally listed desert tortoise found at SCLA a species not addressed in the BO for the California tiger salamander.

Line 20-27 Page 4-90
"The SCLA alternative would not affect populations of the federally listed desert tortoise (threatened) or the state-listed Mojave Desert ground squirrel (threatened). Due to the past land use and airport construction activities, the quality of habitats for these two is species have been reduced to a degree where occurrence is highly unlikely. Further, there are no records of the desert tortoise or Mojave ground squirrel occurring at the SCLA. Other federally and state-listed species are associated with a riparian corridor to the east of the SCLA and would not be impacted by the SCLA Alternative."
Please refer to the comment provided for **Line 37-42 Page 5**.

The EA/FONSI, also, fails to address burrowing owl *(Athene cunicularia)* or the species' associated habitat.

Lastly, the Department would request a copy of the biological study (similar to that of the included Travis AFB report) for the SCLA site and its associated species and/or habitats.

Questions regarding this letter and further coordination on these issues should be directed to Mr. Eric Weiss, Environmental Scientist at (760) 246-8828.

Sincerely,

Tonya Moore

Tonya Moore
Senior Environmental Scientist

cc: Eric Weiss, DFG
State Clearinghouse

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Draft Environmental Assessment Permanent Western United States C-17 Landing Zone June 2008			
Comment No.	**Author**	**Comment**	**Response**
1	Mojave Air Quality Management District, Victorville, CA	No actionable comments	Noted.
2	California Department of Transportation/Division of Aeronautics, Sacramento, CA	No actionable comments	Noted.
3	William Riley, Soap Lake, Washington	No actionable comments	Noted.
4	California Department of Fish and Game, Bishop, CA	The Department is providing comments in context of the SCLA project site in particular.	Noted.

5	California Department of Fish and Game, Bishop, CA	Line 37-42, page 5. As identified in the EA/FONSI on page five, "No special status species would be affected. The distribution and life history descriptions for the desert tortoise and Mojave ground squirrel suggest the occurrence of these species at the SCLA would be highly unlikely." The proposed project is well within the range, both historically and currently, of the desert tortoise. The Department has records that reflect the presence of the desert tortoise within the SCLA property. The proposed project site is located within the range of the Mohave ground squirrel (MGS); however, protocol surveys for MGS were not performed. Please reference lines 23-28, page 3-65 of the EA/FONSI.	This comment pertains to the Biological Resources summary for the SCLA Alternative in the FONSI. The summary was revised as follows: "The SCLA is within the range of three special status species that may be affected by this alternative—the desert tortoise, the Mojave ground squirrel, and the burrowing owl. The California Department of Fish and Game (DFG) has records of desert tortoise occurrence within the SCLA boundary; however, the distribution and life history requirements for this species coupled with the prior land use practices decreases the suitability of the desert tortoise habitat within the SCLA. The Mojave ground squirrel also has potential to occur within the SCLA boundary; however, the SCLA LZ location does not contain alluvial fans or other landform features associated with the squirrel. The burrowing owl, a state species of concern, does occur within the SCLA boundary; however, there are no records of occurrence within the SCLA LZ site location although suitable habitat conditions are present." Additionally, the following text was added to the Mitigation and Conservation and Minimization section of the FONSI: "The conservation and minimization measures listed above apply to the Proposed Action at Travis AFB (*i.e.*, the Preferred Alternative). Should the Air Force, for an unforeseeable reason, choose the SCLA Alternative rather than the Proposed Action, three species of concern may be impacted. Selection of the SCLA Alternative would require conservation measures similar to those for the Proposed Action at Travis AFB to avoid, minimize, or offset impacts to the desert tortoise, Mojave ground squirrel, and/or the burrowing owl. The Air Force would conduct the necessary protocol surveys approved by the USFWS and/or DFG to minimize impacts as appropriate. Conservation and minimization options could include purchasing credits through the Desert Tortoise Preserve Committee for assistance in land preserve acquisition or in-lieu fee payments to conservation organizations that manage for species of concern that could potentially be affected by the SCLA Alternative. Other conservation and minimization measures could be developed in consultation with the DGF and the USFWS Carlsbad Ecological Services Field Office."

6	California Department of Fish and Game, Bishop, CA	Line 33, page 1-6. The EA/FONSI identifies negotiations with Grant County and the Washington State Department of Natural Resources. Negotiations with the Washington Department of Natural Resources has indicated "…no record of rare plants or high quality ecosystems at the airport." This section of the document needs updating to reflect the current period.	The Description of Proposed Action and Alternatives was distributed to the Washington Department of Resources prior to preparation of the Draft EA for review and identification of resources that may be impacted by the project. The Department did not identify any resources of concern. Additionally, the proposed project for the Permanent LZ EA at Grant County Airport is identical to the proposed project at the Airport for the Interim LZ EA when considering biological resources. The Department provided no comments from review of the Draft Interim LZ EA. Thus, when considering the described process to update the condition at the Airport, the literature used to support why biological resources are not assessed is current.
7	California Department of Fish and Game, Bishop, CA	Line 1, page 2-11. Alternative 1 (later identified as the "preferred alternative [line 15-17, page 2-11]") would require the acquisition of "Approximately 37 acres of land that possibly has one federally listed endangered species, or would provide habitat for the species, would be affected." This document should address the extent of affects and appropriate actions.	The EA and FONSI were revised to address listed species. See responses to other comments.

8	California Department of Fish and Game, Bishop, CA	Pages 2-23 through 2-34. The construction/contractor conditions as well as the conservation and minimization measures apply, from what is evident, solely to the Travis AFB and the California tiger salamander. The Department was unable to distinguish any measures designed or otherwise committed for the SCLA project site.	Subchapter 2.2.3.3, with the following text, was added to the EA: "Selection of the SCLA Alternative would require conservation measures similar to those for the Proposed Action at Travis AFB to avoid, minimize, or offset impacts to the desert tortoise, Mojave ground squirrel, and/or the burrowing owl (see Subchapter 2.2.2.3). The Air Force would conduct the necessary protocol surveys approved by the USFWS and/or DFG to minimize impacts as appropriate. Conservation and minimization options could include purchasing credits through the Desert Tortoise Preserve Committee for assistance in land preserve acquisition or in-lieu fee payments to conservation organizations that manage for species of concern that could potentially be affected by the SCLA Alternative. Other conservation and minimization measures could be developed in consultation with the DGF and the USFWS Carlsbad Ecological Services Field Office."

9	California Department of Fish and Game, Bishop, CA	Page 2-44 and Appendix D. The EA/FONSI states "No mitigation would be required to reduce the impacts for aircraft operations and safety and BASH, noise, land use, air quality (i.e., Proposed Action at the Grant County Airport and the SCLA Alternative at any of the three airfields), or cultural resources to less than significant. Since surveys for the SCLA site has not been provided, the Department can not concur with these conclusions as there is a federally listed species (desert tortoise) at the SCLA site. The last paragraph under section **2.6 Mitigation** goes on to say that "The Air Force conducted Section 7 ESA consultation with the USFWS [United States Fish and Wildlife Service] Sacramento Ecological Services Field Office for impacts of the proposed action on special status species and habitats. The process is summarized in subchapter 1.3 and Appendix D contains the BA and BO associated with the project as well as a summary of the history of consultation. Subchapter 2.2.2.3 details the conservation and minimization measures associated with the Proposed Action at Travis AFB." The information provided with the EA/FONSI does indicate that the USFWS was consulted for the proposed project at Travis AFB. However, the consultation did not include the SCLA site, nor does it include consultation with the USFWS for the federally listed desert tortoise found at SCLA a species not addressed in the BO for the California tiger salamander.	The following paragraph was added to Subchapter 2.6, Conservation and Minimization Measures, following the paragraph related to Travis AFB: "As indicated in Subchapter 2.4, the Preferred Alternative is the Proposed Action. Should the Air Force, for an unforeseeable reason, choose the SCLA Alternative rather than the Proposed Action, three species of concern may be impacted. Selection of the SCLA Alternative would require conservation measures similar to those for the Proposed Action at Travis AFB to avoid, minimize, or offset impacts to the desert tortoise, Mojave ground squirrel, and/or the burrowing owl. The Air Force would conduct the necessary protocol surveys approved by the USFWS and/or DFG to minimize impacts at the SCLA as appropriate. Conservation and minimization options could include purchasing credits through the Desert Tortoise Preserve Committee for assistance in land preserve acquisition or in-lieu fee payments to conservation organizations that manage for species of concern that could potentially be affected by the SCLA Alternative. Other conservation and minimization measures could be developed in consultation with the DGF and the USFWS Carlsbad Ecological Services Field Office."

10	California Department of Fish and Game, Bishop, CA	Line 20-27, page 4-90. "The SCLA Alternative would not affect populations of the federally listed desert tortoise (threatened) or the state-listed Mojave Desert ground squirrel (threatened). Due to the past land use and airport construction activities, the quality of habitats for these two is species have been reduced to a degree where occurrence is highly unlikely. Further, there are no records of the desert tortoise or Mojave ground squirrel occurring at the SCLA. Other federally and state-listed species are associated with a riparian corridor to the east of the SCLA and would not be impacted by the SCLA Alternative." Please refer to the comment provided for Line 37-42, Page 5.	Subchapter 3.2.5.2 was revised based on the concepts the California Department of Fish and Game presented in the comment. The text on page 4-90 was revised as follows: "The SCLA Alternative may affect populations of the federally listed desert tortoise (threatened), the state-listed Mojave ground squirrel (threatened), and/or the burrowing owl (state species of concern). However, conservation and minimization measures would minimize any harming or harassing of these species. Construction of the LZ at the SCLA would result in permanent habitat removal. Other federally and state-listed species are associated with a riparian corridor to the east of the SCLA and would not be impacted by the SCLA Alternative." In addition to the above identified revisions based on the California Department of Fish and Game comments, Subchapter 4.3.5.3, Mitigation, was revised with the following text: "Selection of the SCLA Alternative would require conservation measures similar to those for the Proposed Action at Travis AFB to avoid, minimize, or offset impacts to the desert tortoise, Mojave ground squirrel, and/or the burrowing owl. The Air Force would conduct the necessary protocol surveys approved by the USFWS and/or DFG to minimize impacts at the SCLA as appropriate. Conservation and minimization options could include purchasing credits through the Desert Tortoise Preserve Committee for assistance in land preserve acquisition or in-lieu fee payments to conservation organizations that manage for species of concern that could potentially be affected by the SCLA Alternative. Other conservation and minimization measures could be developed in consultation with the DGF and the USFWS Carlsbad Ecological Services Field Office." See response to comment 5.

11	California Department of Fish and Game, Bishop, CA	The EA/FONSI also fails to address burrowing owl (*Athene cunicularia*) or the species associated habitat.	See response to comment 10.
12	California Department of Fish and Game, Bishop, CA	Lastly, the Department would request a copy of the biological study (similar to that of the included Travis AFB report) for the SCLA site and its associated species and/or habitats.	As indicated in the Decision paragraph of the draft FONSI, the Air Force will implement the Proposed Action, which includes construction of the LZ at Travis AFB and ensuing aircraft operations on the LZ as well as operations at the Grant County Airport. Subchapter 2.4 of the draft EA stated that the Preferred Alternative is the Proposed Action as described in the preceding sentence. As mentioned in responses to other comments, the Air Force would accomplish biological studies should, for an unforeseeable reason, the Air Force chose the SCLA Alternative rather than the Proposed Action.

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PARSONS

8000 Centre Park Drive, Suite 200 • Austin, Texas 78754 • (512) 719-6000 • Fax: (512) 719-6099 • www.parsons.com

September 29, 2008

Re: Final Environmental Assessment
Permanent Western United States C-17 Landing Zone

To Whom It May Concern:

The United States Air Force, with Parsons assistance, prepared a Final Environmental Assessment (EA) for the establishment of C-17 Landing Zones (LZs) for aircraft operations on an permanent basis in the western United States. The LZs allow C-17 aircraft from Travis Air Force Base (AFB), California to conduct required day and night training. The Final EA describes and analyzes alternative plans to implement the Proposed Action, the Southern California Logistics Airport Alternative, and the No Action Alternative.

Mr. Doug Allbright, Headquarters Air Mobility Command (618) 229-0846, is the primary point of contact for preparation of the EA. The point of contact for local issues at Travis AFB is Mr. Rudy Pontemayor, (707) 424-7517.

Sincerely,

PARSONS

Peggy Bzdawka (for)

John Wallin

Attachments: 1. Distribution List
2. Final EA

Distribution List

Federal Aviation Administration Planning and Programming San Francisco Airports Division Attn: Mr. Joe Rodriguez 831 Mitten Road, Room 210 Burlingame, CA 94010	Federal Aviation Administration Northwest Mountain Region 1601 Lind Ave. SW Renton, WA 98055
Department of the Interior Office of Environmental Policy and Compliance Attn: Ms. Patricia Port 1111 Jackson Street, Suite 520 Oakland, CA 94607	U.S. Department of Interior Fish and Wildlife Service Federal Building 2800 Cottage, Room W-2605 Sacramento, CA 95825-1846
U.S. Environmental Protection Agency Region 9 75 Hawthorne Street San Francisco, CA 94105	California Department of Fish and Game P.O. Box 944209 Sacramento, CA 94299-2090
Governor's Office of Planning and Research State Clearinghouse P.O. Box 3044 Sacramento, CA 95814	State Historic Preservation Officer Department of Parks and Recreation P.O. Box 942896 Sacramento, CA 94296-0001
Air Force Western Regional Environmental Office Attn: Mr. Gary Munsterman AFCEE/CCR-S 333 Market Street., Suite 600 San Francisco, CA 94105	Department of Resource Management Solano County 675 Texas Street, Suite 5500 Fairfield, CA 94533
California Air Resources Board Air Quality and Transportation Division 1001 "I" Street P.O. Box 2815 Sacramento, CA 95812	Bay Area AQMD 939 Ellis Street San Francisco, CA 94109-7799
Yolo-Solano AQMD 1947 Galileo Ct., Ste 103 Davis, CA 95616-4882	Kern County APCD 2700 "M" Street, Suite 302 Bakersfield, California 93301-2370
Antelope Valley AQMD 43301 Division Street, Suite 206 Lancaster CA 93535	South Coast AQMD 21865 Copley Dr. Diamond Bar, CA 91765

Mojave Desert AQMD 14306 Park Ave. Victorville, CA 92392	Imperial County APCD 150 South 9th Street El Centro, CA 92243-2801
Washington Department of Natural Resources P.O. Box 190 Colville, WA 99114	Washington State Department of Ecology Eastern Regional Office – Air Quality N. 4601 Monroe St, Suite 100 Spokane, WA 99205-1295
State of Washington Environmental Review Washington Department of Ecology P.O. Box 47600 Olympia, WA 98504	Southern California Logistics Airport Mr. Peter Soderquist, Airport Director 18374 Phantom Victorville, CA 92394
Executive Manager Port of Moses Lake 7810 Andrews St. N. E., Suite 200 Moses Lake, WA 98837	Mr. Frank J. Andrews 1107 Kentucky Street Fairfield, CA 94533
Mr. Richard C. Jacobs Howard Rice Nemerovski Canady Falk & Rabkin Three Embarcadero Center Seventh Floor San Francisco, CA 94111-4024	Mike Marchand, Chairman Colville Business Council P.O. Box 150 Nespelem, WA 99155-0150
Richard L. Sherwood, Chairman Spokane Business Council P.O. Box 100 Wellpinit, WA 99040-0100	Lavina Washines, Chairwoman Yakama Tribal Council P.O. Box 151 Toppenish, Wa 98948-0151
Linda Otero, Director AhaMaKav Cultural Society Fort Mojave Indian Tribe P.O. Box 5990 Mohave Valley, AZ 86440	Elaine Patterson, Chairperson Cortina Band of Indians P.O. Box 1630 Williams, CA 95987
Charles Wood, Chairperson Chemehuevi Reservation P.O. Box 1976 Chemehuevi Valley, CA 92363	Britt W. Wilson, Cultural Resources-Project Manager Morongo Band of Mission Indians 49750 Seminole Drive Cabazon, CA 92230
Marshall McKay, Chairperson Rumsey Rancheria P.O. Box 18 Brooks, CA 95606	John Valenzuela, Chairperson San Fernando Band of Mission Indians P.O. Box 221838 Newhall, CA 91322
Henry Duro, Chairperson San Manuel Band of Mission Indians 26569 Community Center Drive Highland, CA 92346	Ann Brierty, Environmental Department San Manuel Band of Mission Indians 101 Pure Water Lane Highland, CA 92346
Goldie Walker Serrano Band of Indians 6588 Valeria Drive Highland, CA 92346	Wintun Environmental Protection Agency P.O. Box 1839 Williams, CA 95987
Charlie Cooke Tehachapi Indian Tribe 32835 Santiago Road Acton, CA 993510	Kesner Flores P.O. Box 1047 Wheatland, CA 95692
Ron Wermuth P.O. Box 168 Kernville, CA 93238	Muzzy Farms 1107 Kentucky Street Fairfield, CA 94533
Weintraub Genshlea Chediak Attn: Mr. Michael A. Kvarme 400 Capitol Mall, Eleventh Floor Sacramento, CA 95814	

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Form A

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P. O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # _____

Project Title: ENVIRONMENTAL ASSESSMENT PERMANENT WESTERN UNITED STATES C-17 LANDING ZONE

Lead Agency: U.S. AIR FORCE / 60TH AIR MOBILITY WING Contact Person: MR. RUDY PONTEMAYOR

Mailing Address: 60CES/CEAN, 411 ARMEN DR Phone: 707/424-7517

City: TRAVIS AFB, CA Zip: 94534 County: _____

Project Location:

County: SOLANO City/Nearest Community: _____ Total Acres: _____

Cross Streets: _____ Zip Code: _____

Assessor's Parcel No. _____ Section: _____ Twp. _____ Range: _____ Base: _____

Within 2 Miles: State Hwy #: _____ Waterways: _____

Airports: _____ Railways: _____ Schools: _____

Document Type:

CEQA: ☐ NOP ☐ Draft EIR NEPA: ☐ NOI Other: ☐ Joint Document
☐ Early Cons ☐ Supplement to EIR (Note prior SCH # below) ☒ EA FINAL ☐ Final Document
☐ Neg Dec ☐ Subsequent EIR (Note prior SCH # below) ☐ Draft EIS ☐ Other _____
☐ Mit Neg Dec ☐ Other _____ ☒ FONSI FINAL

Local Action Type:

☐ General Plan Update ☐ Specific Plan ☐ Rezone ☐ Annexation
☐ General Plan Amendment ☐ Master Plan ☐ Prezone ☐ Redevelopment
☐ General Plan Element ☐ Planned Unit Development ☐ Use Permit ☐ Coastal Permit
☐ Community Plan ☐ Site Plan ☐ Land Division (Subdivision, etc.) ☒ Other N/A

Development Type:

☐ Residential: Units_____ Acres_____
☐ Office: Sq.ft._____ Acres_____ Employees_____
☐ Commercial: Sq.ft._____ Acres_____ Employees_____
☐ Industrial: Sq.ft._____ Acres_____ Employees_____
☐ Educational _____
☐ Recreational _____
☐ Water Facilities: Type_____ MGD_____
☐ Transportation: Type_____
☐ Mining: Mineral _____
☐ Power: Type_____ MW _____
☐ Waste Treatment: Type_____ MGD_____
☐ Hazardous Waste: Type_____
☒ Other: N/A

Project Issues Discussed in Document:

☐ Aesthetic/Visual ☐ Fiscal ☐ Recreation/Parks ☐ Vegetation
☐ Agricultural Land ☐ Flood Plain/Flooding ☐ Schools/Universities ☐ Water Quality
☒ Air Quality ☐ Forest Land/Fire Hazard ☐ Septic Systems ☐ Water Supply/Groundwater
☒ Archeological/Historical ☐ Geologic/Seismic ☐ Sewer Capacity ☐ Wetland/Riparian
☒ Biological Resources ☐ Minerals ☐ Soil Erosion/Compaction/Grading ☐ Growth Inducement
☐ Coastal Zone ☒ Noise ☐ Solid Waste ☒ Land Use
☐ Drainage/Absorption ☐ Population/Housing Balance ☐ Toxic/Hazardous ☐ Cumulative Effects
☐ Economic/Jobs ☐ Public Services/Facilities ☐ Traffic/Circulation ☒ Other AIRCRAFT OPERATIONS

Present Land Use/Zoning/General Plan Designation:

N/A

Project Description: *(please use a separate page if necessary)*

CONSTRUCT AND OPERATE C-17 LANDING ZONES IN THE WESTERN UNITED STATES

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

continued

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X". If you have already sent your document to the agency please denote that with an "S".

_____Air Resources Board
_____Boating & Waterways, Department of
_____California Highway Patrol
_____Caltrans District #_____
_____Caltrans Division of Aeronautics
_____Caltrans Planning
_____Coachella Valley Mountains Conservancy
_____Coastal Commission
_____Colorado River Board Commission
_____Conservation, Department of
_____Corrections, Department of
_____Delta Protection Commission
_____Education, Department of
_____Office of Public School Construction
_____Energy Commission
_____Fish & Game Region # _____
_____Food & Agriculture, Department of
_____Forestry & Fire Protection
_____General Services, Department of
_____Health Services, Department of
_____Housing & Community Development
_____Integrated Waste Management Board
_____Native American Heritage Commission
_____Office of Emergency Services
_____Office of Historic Preservation
_____Parks & Recreation
_____Pesticide Regulation, Department of
_____Public Utilities Commission
_____Reclamation Board
_____Regional WQCB #_____
_____Resources Agency
_____S.F. Bay Conservation & Development Commission
_____San Gabriel & Lower Los Angeles Rivers & Mountains Conservancy
_____San Joaquin River Conservancy
_____Santa Monica Mountains Conservancy
_____State Lands Commission
_____SWRCB: Clean Water Grants
_____SWRCB: Water Quality
_____SWRCB: Water Rights
_____Tahoe Regional Planning Agency
_____Toxic Substances Control, Department of
_____Water Resources, Department of

_____Other _____
_____Other _____

Local Public Review Period (to be filled in by lead agency)

Starting Date N/A COMPLETED AUGUST 12, 2008 Ending Date _____

Lead Agency (Complete if applicable):

Consulting Firm: PARSONS
Address: 8000 CENTRE PARK DR
City/State/Zip: AUSTIN, TX 78754
Contact: JOHN WALLIN
Phone: (512) 719-6500

Applicant: GO CES/CEAN
Address: 411 ARMEN DR
City/State/Zip: TRAVIS AFB CA 94535
Phone: (707) 424-7517

Signature of Lead Agency Representative JM Wallin Date 29 SEP 08

Authority cited: Section 21083 and 21087, Public Resources Code. Reference: Section 21161, Public Resources Code.

APPENDIX B
PUBLIC INVOLVEMENT

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PUBLIC INVOLVEMENT

The *Air Force Environmental Impact Analysis Process* (32 CFR 989), 15 Jul 99, and amended 28 Mar 01, states that the environmental assessment and Finding of No Significant Impact should be made available to agencies under the IICEP (see Appendix A) and the public for comment.

A notice announcing the 30-day public comment period and the availability of the draft EA was published in newspapers on July 14, 2008. Copies of the draft EA were sent to interested individuals (see Appendix A). Additionally, a copy of the draft EA was placed in libraries for public review. The names of the newspapers in which the notices of availability were published and the libraries in which the draft EA was placed are listed below. No substantive comments on the draft EA were received from the public. Copies of the final EA were sent to interested individuals (see Appendix A).

Columbia Basin Herald (Moses Lake, Washington)
Daily Republic (Fairfield, California)
Tailwind (Travis AFB newspaper)
Victorville Daily Press (Victorville, California)

Moses Lake Library 418 E 5th Avenue Moses Lake, WA 98837-1797
Fairfield-Suisun Community Library 1150 Kentucky Street Fairfield, CA 94533
Victorville City Library 15011 Circle Dr. Victorville, CA 92395
Vacaville Public Library 1020 Ulatis Drive Vacaville, CA 95688
Adelanto Branch Library 11497 Bartlett Ave. Adelanto, CA 92301
Mitchell Memorial Library 510 Travis Boulevard Travis AFB, CA 64535

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July 9, 2008

Reference Librarian - Adult Reference Desk
Vacaville Public Library
1020 Ulatis Drive
Vacaville, CA 95688

Subject: Draft Environmental Assessment
Permanent Western United States C-17 Landing Zone

Dear Reference Librarian:

On behalf of the U.S. Air Force, Headquarters Air Mobility Command at Scott Air Force Base, Illinois, Parsons is pleased to provide you with this copy of the Draft Environmental Assessment for the proposed establishment and operation of permanent C-17 landing zones in the western United States. This document should be made available to the public upon request. This document is also available on line at http://public.travis.amc.af.mil/. Additional printed copies of this document are also available upon request from (618) 229-0846.

We request that your receipt of this document be confirmed. Please fill in and sign the bottom portion of this letter and fax it back to (512) 719-6099 attn: John Wallin. The confirmation can also be mailed to the above address, attn: John Wallin. You may also confirm via an email message to rosemarie.crisologo@parsons.com.

Should you have any questions, please call the undersigned at (512) 417-9152. Thank you for your assistance.

Sincerely,
PARSONS

Peggy Bezdansky (for)

John Wallin

Attachment: Draft EA

CONFIRMATION OF RECEIPT:

_____ _____
Signature Date

_____ _____
Printed Name For Vacaville Public Library

PARSONS

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July 9, 2008

Reference Librarian - Adult Reference Desk
Fairfield-Suisun Community Library
1150 Kentucky Street
Fairfield, CA 94533

Subject: Draft Environmental Assessment
Permanent Western United States C-17 Landing Zone

Dear Reference Librarian:

On behalf of the U.S. Air Force, Headquarters Air Mobility Command at Scott Air Force Base, Illinois, Parsons is pleased to provide you with this copy of the Draft Environmental Assessment for the proposed establishment and operation of permanent C-17 landing zones in the western United States. This document should be made available to the public upon request. This document is also available on line at http://public.travis.amc.af.mil/. Additional printed copies of this document are also available upon request from (618) 229-0846.

We request that your receipt of this document be confirmed. Please fill in and sign the bottom portion of this letter and fax it back to (512) 719-6099 attn: John Wallin. The confirmation can also be mailed to the above address, attn: John Wallin. You may also confirm via an email message to rosemarie.crisologo@parsons.com.

Should you have any questions, please call the undersigned at (512) 417-9152. Thank you for your assistance.

Sincerely,

PARSONS

Peggy Bezdecky (for)

John Wallin

Attachment: Draft EA

CONFIRMATION OF RECEIPT:

_____ _____
Signature Date

_____ _____
Printed Name For Fairfield-Suisun Community Library

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July 9, 2008

Reference Librarian - Adult Reference Desk
Mitchell Memorial Library
510 Travis Boulevard
Travis AFB, CA 94535

Subject: Draft Environmental Assessment
Permanent Western United States C-17 Landing Zone

Dear Reference Librarian:

On behalf of the U.S. Air Force, Headquarters Air Mobility Command at Scott Air Force Base, Illinois, Parsons is pleased to provide you with this copy of the Draft Environmental Assessment for the proposed establishment and operation of permanent C-17 landing zones in the western United States. This document should be made available to the public upon request. This document is also available on line at http://public.travis.amc.af.mil/. Additional printed copies of this document are also available upon request from (618) 229-0846.

We request that your receipt of this document be confirmed. Please fill in and sign the bottom portion of this letter and fax it back to (512) 719-6099 attn: John Wallin. The confirmation can also be mailed to the above address, attn: John Wallin. You may also confirm via an email message to rosemarie.crisologo@parsons.com.

Should you have any questions, please call the undersigned at (512) 417-9152. Thank you for your assistance.

Sincerely,

PARSONS

Peggy Bezdansky (for)

John Wallin

Attachment: Draft EA

CONFIRMATION OF RECEIPT:

_____ _____
Signature Date

_____ _____
Printed Name For Mitchell Memorial Library

PARSONS

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July 9, 2008

Reference Librarian - Adult Reference Desk
Moses Lake Library
418 E 5th Avenue
Moses Lake, WA 98837-1797

Subject: Draft Environmental Assessment
Permanent Western United States C-17 Landing Zone

Dear Reference Librarian:

On behalf of the U.S. Air Force, Headquarters Air Mobility Command at Scott Air Force Base, Illinois, Parsons is pleased to provide you with this copy of the Draft Environmental Assessment for the proposed establishment and operation of permanent C-17 landing zones in the western United States. This document should be made available to the public upon request. This document is also available on line at http://public.travis.amc.af.mil/. Additional printed copies of this document are also available upon request from (618) 229-0846.

We request that your receipt of this document be confirmed. Please fill in and sign the bottom portion of this letter and fax it back to (512) 719-6099 attn: John Wallin. The confirmation can also be mailed to the above address, attn: John Wallin. You may also confirm via an email message to rosemarie.crisologo@parsons.com.

Should you have any questions, please call the undersigned at (512) 417-9152. Thank you for your assistance.

Sincerely,
PARSONS

Peggy Bezdansky (for)

John Wallin

Attachment: Draft EA

CONFIRMATION OF RECEIPT:

_____ _____
Signature Date

_____ _____
Printed Name For Moses Lake Library

PARSONS

8000 Centre Park Drive, Suite 200 • Austin, Texas 78754 • (512) 719-6000 • Fax: (512) 719-6099 • www.parsons.com

July 9, 2008

Reference Librarian - Adult Reference Desk
Victorville City Library
15011 Circle Dr.
Victorville, CA 92395

Subject: Draft Environmental Assessment
Permanent Western United States C-17 Landing Zone

Dear Reference Librarian:

On behalf of the U.S. Air Force, Headquarters Air Mobility Command at Scott Air Force Base, Illinois, Parsons is pleased to provide you with this copy of the Draft Environmental Assessment for the proposed establishment and operation of permanent C-17 landing zones in the western United States. This document should be made available to the public upon request. This document is also available on line at http://public.travis.amc.af.mil/. Additional printed copies of this document are also available upon request from (618) 229-0846.

We request that your receipt of this document be confirmed. Please fill in and sign the bottom portion of this letter and fax it back to (512) 719-6099 attn: John Wallin. The confirmation can also be mailed to the above address, attn: John Wallin. You may also confirm via an email message to rosemarie.crisologo@parsons.com.

Should you have any questions, please call the undersigned at (512) 417-9152. Thank you for your assistance.

Sincerely,

PARSONS

Peggy Bezdansky (for)

John Wallin

Attachment: Draft EA

CONFIRMATION OF RECEIPT:

_____ _____
Signature Date

_____ _____
Printed Name For Victorville City Library

PARSONS

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July 9, 2008

Reference Librarian - Adult Reference Desk
Adelanto Branch Library
11497 Bartlett Ave
Adelanto, CA 92301

Subject: Draft Environmental Assessment
Permanent Western United States C-17 Landing Zone

Dear Reference Librarian:

On behalf of the U.S. Air Force, Headquarters Air Mobility Command at Scott Air Force Base, Illinois, Parsons is pleased to provide you with this copy of the Draft Environmental Assessment for the proposed establishment and operation of permanent C-17 landing zones in the western United States. This document should be made available to the public upon request. This document is also available on line at http://public.travis.amc.af.mil/. Additional printed copies of this document are also available upon request from (618) 229-0846.

We request that your receipt of this document be confirmed. Please fill in and sign the bottom portion of this letter and fax it back to (512) 719-6099 attn: John Wallin. The confirmation can also be mailed to the above address, attn: John Wallin. You may also confirm via an email message to rosemarie.crisologo@parsons.com.

Should you have any questions, please call the undersigned at (512) 417-9152. Thank you for your assistance.

Sincerely,

PARSONS

Peggy Bezdansky (for)

John Wallin

Attachment: Draft EA

CONFIRMATION OF RECEIPT:

_____ _____
Signature Date

_____ _____
Printed Name For Adelanto Branch Library

NOTICE OF AVAILABILITY
DRAFT ENVIRONMENTAL ASSESSMENT,
DRAFT FINDING OF NO SIGNIFICANT IMPACT, AND
DRAFT FINDING OF NO PRACTICABLE ALTERNATIVE
PERMANENT WESTERN UNITED STATES C-17 LANDING ZONE

In support of the Air Force Airlift Mobility Transformation Plan to standardize airlift aircraft fleets, increase reliability and capability, and reduce operating and support costs, Headquarters Air Mobility Command (HQ AMC), Scott Air Force Base (AFB), Illinois proposes to establish C-17 Landing Zones (LZs) for aircraft operations on an permanent basis in the western United States. The proposed LZs allow C-17 aircraft from Travis AFB, California to conduct required day and night training. The Proposed Action would occur at Travis AFB and the Grant County International Airport (Grant County Airport), Moses Lake, Washington. The alternative action locations include Travis AFB, Grant County Airport, and the Southern California Logistics Airport (SCLA), Victorville, California.

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Written comments may be mailed to:

Department of the Air Force
Attn: Mr. Doug Allbright
HQ AMC/A7PI
507 Symington Drive
Scott AFB, IL 62225-5022

All written comment letters must be postmarked by **August 12, 2008.** Comments may also be faxed to the attention of Mr. Allbright at (618) 256-8624. Faxed comments must be received by close of business on August 12, 2008. Emailed comments will not be accepted. Should you have any questions, please contact Mr. Allbright at (618) 229-0846 or Mr. Rudy Pontemayor at (707) 424-7517 for Travis AFB issues.

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July 9, 2008

Reference Librarian - Adult Reference Desk
Vacaville Public Library
1020 Ulatis Drive
Vacaville, CA 95688

Subject: Draft Environmental Assessment
Permanent Western United States C-17 Landing Zone

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Should you have any questions, please call the undersigned at (512) 417-9152. Thank you for your assistance.

Sincerely,

Peggy Bozdarik (for)

John Wallin

Attachment: Draft EA

CONFIRMATION OF RECEIPT:

Nancy Vitavec
Signature

7/14/08
Date

Nancy Vitavec
Printed Name

For Vacaville Public Library

8000 Centre Park Drive, Suite 200 • Austin, Texas 78754 • (512) 719-6000 • Fax: (512) 719-6099 • www.parsons.com

July 9, 2008

Reference Librarian - Adult Reference Desk
Fairfield-Suisun Community Library
1150 Kentucky Street
Fairfield, CA 94533

Subject: Draft Environmental Assessment
Permanent Western United States C-17 Landing Zone

Dear Reference Librarian:

On behalf of the U.S. Air Force, Headquarters Air Mobility Command at Scott Air Force Base, Illinois, Parsons is pleased to provide you with this copy of the Draft Environmental Assessment for the proposed establishment and operation of permanent C-17 landing zones in the western United States. This document should be made available to the public upon request. This document is also available on line at http://public.travis.amc.af.mil/. Additional printed copies of this document are also available upon request from (618) 229-0846.

We request that your receipt of this document be confirmed. Please fill in and sign the bottom portion of this letter and fax it back to (512) 719-6099 attn: John Wallin. The confirmation can also be mailed to the above address, attn: John Wallin. You may also confirm via an email message to rosemarie.crisologo@parsons.com.

Should you have any questions, please call the undersigned at (512) 417-9152. Thank you for your assistance.

Sincerely,

Peggy Boylan (for)

John Wallin

Attachment: Draft EA

CONFIRMATION OF RECEIPT:

Linda C. Williams
Signature

7/14/08
Date

Linda Williams
Printed Name

For Fairfield-Suisun Community Library

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July 9, 2008

Reference Librarian - Adult Reference Desk
Mitchell Memorial Library
510 Travis Boulevard
Travis AFB, CA 94535

Subject: Draft Environmental Assessment
Permanent Western United States C-17 Landing Zone

Dear Reference Librarian:

On behalf of the U.S. Air Force, Headquarters Air Mobility Command at Scott Air Force Base, Illinois, Parsons is pleased to provide you with this copy of the Draft Environmental Assessment for the proposed establishment and operation of permanent C-17 landing zones in the western United States. This document should be made available to the public upon request. This document is also available on line at http://public.travis.amc.af.mil/. Additional printed copies of this document are also available upon request from (618) 229-0846.

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Should you have any questions, please call the undersigned at (512) 417-9152. Thank you for your assistance.

Sincerely,

Peggy Bezlaudy (for)

John Wallin

Attachment: Draft EA

CONFIRMATION OF RECEIPT:

Marie A. Ludwig
Signature

7/14/08
Date

Marie A. Ludwig
Printed Name

For Mitchell Memorial Library

RAYS:

are great, the kids swam great. Sports have some ups and downs. Ours were mostly ups."

Witcher said it was nice to have his team perform so well after the recent history with the program. The Manta Rays have gone through numerous head coaches in the past few years.

"They have been through a number of coaches," he said. "The people lost confidence in the team because no coach would stay.

Witcher has coached swimming for 33 years and plans to stay with the Manta Rays for a while, he said.

"I think the community is great," he said. "I love the small town atmosphere. I love the home town atmosphere. It helps to get people to work more closely."

While Witcher has only been with the Manta Rays for a few months, but he said it is a great feeling for his team to perform well at the hometown swim meet.

"My kids are gonna get up and race, and that's what they did," he said. "As a new coach working with a team that has been torn apart over the years, to come together is great."

Witcher said 46 of the Manta Rays competed in the invitational.

With his team's strong performance this past weekend, Witcher said he is excited about the future of the Manta Ray swimming program.

"It would be nice to have an international star," he said. "We are a few years away from that, but we have the potential."

NOTICE OF AVAILABILITY
DRAFT ENVIRONMENTAL ASSESSMENT, DRAFT FINDING OF NO SIGNIFICANT IMPACT, AND DRAFT FINDING OF NO PRACTICABLE ALTERNATIVE PERMANENT WESTERN UNITED STATES C-17 LANDING ZONE

In support of the Air Force Airlift Mobility Transformation Plan to standardize airlift aircraft fleets, increase reliability and capability, and reduce operating and support costs, Headquarters Air Mobility Command (HQ AMC), Scott Air Force Base (AFB), Illinois proposes to establish C-17 Landing Zones (LZs) for aircraft operations on an permanent basis in the western United States. The proposed LZs allow C-17 aircraft from Travis AFB, California to conduct required day and night training. The Proposed Action would occur at Travis AFB and the Grant County International Airport (Grant County Airport), Moses Lake, Washington. The alternative action locations include Travis AFB, Grant County Airport, and the Southern California Logistics Airport (SCLA), Victorville, California.

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Written comments may be mailed to:

Department of the Air Force
Attn: Mr. Doug Allbright
HQ AMC/A7PI
507 Symington Drive
Scott AFB, IL 62225-5022

All written comment letters must be postmarked by **August 12, 2008**. Comments may also be faxed to the attention of Mr. Allbright at (618) 256-8624. Faxed comments must be received by close of business on August 12, 2008. Emailed comments will not be accepted. Should you have any questions, please contact Mr. Allbright at (618) 229-0846 or Mr. Rudy Pontemayor at (707) 424-7517 for Travis AFB issues.

with orchestrating violence in Darfur that has left hundreds of thousands of people dead since 2003.

In Sudan, the ruling National Congress Party called the case against the al-Bashir "irresponsible cheap political blackmail" that has no legal basis, according to a statement from the party that was broadcast on state TV. It also warned there would be "more violence and blood" in Darfur if an arrest warrant is issued against the president, TV reported.

Al-Bashir huddled with Cabinet ministers and advisers Sunday, weighing how the government would response to any action taken by the ICC. Sudan has also asked the Arab League for an emergency meeting of Arab foreign ministers.

Outside the meeting, hundreds of Sudanese, many carrying flags and pro-government banners, demonstrated to show their support for al-Bashir, who seized power in a 1989 coup. Others held signs ridiculing the ICC and its prosecutor, Luis Moreno-Ocampo of Argentina. "Ocampo is a plotter against Sudan's people," one banner read.

NOTICE OF AVAILABILITY

DRAFT ENVIRONMENTAL ASSESSMENT, DRAFT FINDING OF NO SIGNIFICANT IMPACT, AND DRAFT FINDING OF NO PRACTICABLE ALTERNATIVE PERMANENT WESTERN UNITED STATES C-17 LANDING ZONE

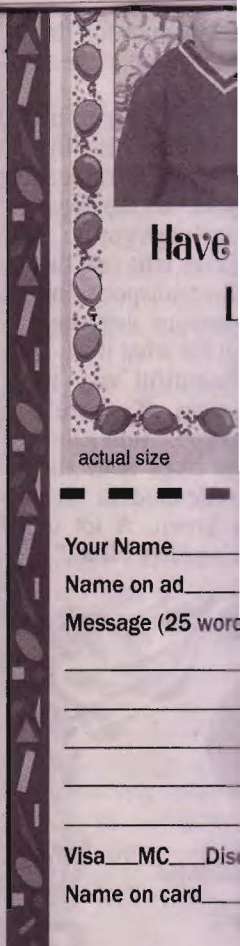
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August 7 & 28, 2008 6 p.m. Carrows 17398 Main St. Hesperia, 92345	August 9, 2008 9:30 a.m. Coco's 15570 Park Ave. E. Victorville, 92392	August 1 10 a.m. Applebee 1920 Bea Apple Va

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NOTICE OF AVAILABILITY

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Dept of the Air Force
Attn: Mr Doug Allbright
HQ AMC/A7PI
507 Symington Drive
Scott AFB, ILL. 62225-5022

July 20. 2008

Subject: Draft Environmental Impact Statement of C-17 Landings in Moses Lake, WA

Dear Sir,

Please include this letter as part of the permanent record in compliance with the Draft EIS.

I have reviewed the Draft EA and its analysis, alternative actions and no action alternative, as found at http://public.travis.amc.af.mil/enviro.

The ML Airport is one of the longest runways on the west coast. The adjacent topography is essentially flat and rural land. Since no commercial passenger aviation exists at Moses Lake, and the JAL pilot training with 747 Commercial jets is ceasing, the airport is vastly underused.

The Federal Government has invested tens of millions of dollars in this airport. At this time with numerous wars continuing and the safe and experienced use of military aircraft vital to the nation's defense, the use of this airport for training, and the day/night landing of military aircraft is an effective use of this asset.

The civilian community consists of approximately 20,000 individuals residing within a 8 mile circle of this airport. There is a long history of public support for the previous Larson AFB designation of this airport, and an overall support of all branches of the US Military.

It is my conclusion that the proposed action is well defined in this draft Environmental Assessment, and will have virtually a zero negative impact upon existing lifestyles, the environment, and the other uses of this airport. Based upon that assessment I enthusiastically support the use of the Moses Lake Airport as a landing site for military aircraft.

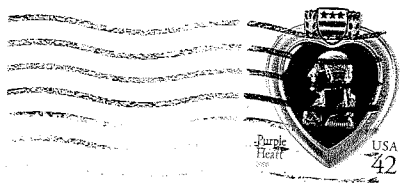
Sincerely,

William Riley, BS, MS
POB 1285
Soap Lake, WA 98851-1285

Mr. William T. Riley
PO Box 1285
Soap Lake, WA 98851-1285

In God We Trust

WENATCHEE WA 988
PM
17 JUL
2000



DEPT OF THE AIR FORCE
ATTN: MR DOUG ALLBRIGHT
HQ AMC/A7PI
507 SYMINGTON DRIVE
SCOTT AFB, ILLINOIS 62225-5022

62225$5022 C000

APPENDIX C
CLEAN AIR ACT GENERAL CONFORMITY APPLICABILITY ANALYSIS FOR A PERMANENT WESTERN UNITED STATES C-17 LANDING ZONE, PROPOSED ACTION, TRAVIS AFB, CALIFORNIA

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

11 Dec 07

Mr. David H. Musselwhite
60 CES/CEV
411 Airmen Drive
Travis AFB CA 94535-2001

Mr. Greg Tholen
Bay Area Air Quality Management District
939 Ellis Street
San Francisco CA 94109

Dear Mr. Tholen

The Clean Air Act General Conformity Applicability Analysis for the proposed construction and operation of a C-17 landing zone at Travis is attached.

Based on the information in the Applicability Analysis, the Air Force has determined that the Proposed Action positively conforms to the State Implementation Plan. This conclusion of positive General Conformity determination fulfills the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B, and a Conformity Determination is not required.

If you require any additional action or information, please contact Mr. Xuyen Lieu at (707) 424-5103.

DAVID H. MUSSELWHITE, YF-02, DAF
Chief, Environmental Flight

Attachment:
Draft Final Clean Air Act General Conformity Applicability Analysis for a Permanent Western United States C-17 Landing Zone, December 2007

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BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT
SINCE 1955

ALAMEDA COUNTY
Tom Bates
Scott Haggerty
Janet Lockhart
Nate Miley

CONTRA COSTA COUNTY
John Gioia
Mark Ross
(Chair)
Michael Shimansky
Gayle B. Uilkema

MARIN COUNTY
Harold C. Brown, Jr.

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SAN FRANCISCO COUNTY
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Erin Garner
Yoriko Kishimoto
Liz Kniss
Patrick Kwok

SOLANO COUNTY
John F. Silva

SONOMA COUNTY
Tim Smith
Pamela Torliatt
(Secretary)

Jack P. Broadbent
EXECUTIVE OFFICER/APCO

December 20, 2007

Mr. David H. Musselwhite
60 CES/CEV
411 Airmen Drive
Travis AFB, CA 94535-2001

Subject: Clean Air Act General Conformity Applicability Analysis for a Permanent Western United States C-17 Landing Zone

Dear Mr. Musselwhite:

Bay Area Air Quality Management District (District) staff have reviewed the Clean Air Act General Conformity Applicability Analysis for a Permanent Western United States C-17 Landing Zone (Proposed Action) that you provided to us on December 11, 2007.

We understand that with approval of the Proposed Action, the Air Force will construct a 3,500 foot-long, 90-foot wide landing zone with 300-foot overruns at each end. The landing zone will provide necessary infrastructure to base 13 C-17 aircraft at Travis AFB and allow aircrews from Travis AFB and other installations to accomplish tactical flight training operations. We also understand that the Air Force is reducing the current compliment of C-5 aircraft based at Travis AFB from 37 to 16. Other aircraft currently based at Travis AFB include 27 KC-10s, and Navy E-6 and Coast Guard C-130 aircraft.

As stated in your analysis, the Clean Air Act (CAA) requires that federal actions conform to the appropriate State Implementation Plan (SIP) for each nonattainment and maintenance criteria air pollutant. For federal conformity purposes, the criteria air pollutants of concern in the District are ozone and carbon monoxide (CO). The applicable SIP for ozone is the 2001 Ozone Attainment Plan prepared by the District, the Metropolitan Transportation Commission and the Association of Bay Area Governments. The applicable SIP for CO is the 2004 Revision to the California State Implementation Plan for Carbon Monoxide prepared by the California Air Resources Board (CARB) for ten California CO maintenance areas including the District.

Both of these SIPs include the most recent emissions inventory and budgets for ozone precursors [volatile organic compounds (VOC) and nitrogen oxides (NOx)] and CO, which have been approved by the U.S. Environmental Protection Agency and must be used for federal conformity determinations. The SIPs do not include specific line items identifying emissions from Travis AFB operations. However, we can estimate these emissions by examining the SIP inventories.

Spare the Air

After a thorough review of your conformity analysis of the Proposed Action, we concur that the total direct and indirect CO and VOC emissions anticipated from the Proposed Action are less than 100 tons per year and are therefore below the *de minimis* levels established in the CAA. We also concur with your conclusions that the emissions for CO, VOC and NOx are less than 10 percent of the District's emissions inventory for each pollutant and therefore are not regionally significant.

The total direct and indirect NOx emissions of 124 tons per year anticipated from the Proposed Action are above the *de minimis* level of 100 tons per year. However, we have determined that the NOx emissions from the Proposed Action (124 tons/year), in addition to existing NOx emissions (1,378 tons/year), for a total of 1,502 tons per year, do not exceed our estimate of the NOx emissions attributed to Travis AFB of 1,734 tons per year. The emissions anticipated from the Proposed Action are reasonably accounted for in the applicable SIPs.

Based on the above discussion and the information contained in the analysis, the Proposed Action conforms to the applicable SIPs. Please contact Greg Tholen, Senior Environmental Planner, at 415-749-4954 or gtholen@baaqmd.gov, if you have any questions regarding our comments.

Sincerely,

Jean Roggenkamp
Deputy Air Pollution Control Officer

cc: BAAQMD Director John F. Silva
Mr. Scott Dickinson

CLEAN AIR ACT
GENERAL CONFORMITY APPLICABILITY ANALYSIS FOR A PERMANENT WESTERN UNITED STATES C-17 LANDING ZONE

Proposed Action, Travis AFB, California



DEPARTMENT OF THE AIR FORCE
AIR MOBILITY COMMAND

December 2007

CLEAN AIR ACT
GENERAL CONFORMITY APPLICABILITY ANALYSIS FOR A PERMANENT WESTERN UNITED STATES C-17 LANDING ZONE

Proposed Action, Travis AFB, California

DEPARTMENT OF THE AIR FORCE

AIR MOBILITY COMMAND

December 2007

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ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
AFIERA	Air Force Institute for Environmental, Safety, & Occupational Health Risk Analysis
ARB	Air Reserve Base
AQCR	Air Quality Control Region
Avg	Average
BAAQMD	Bay Area Air Quality Management District
Bldg	Building
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CARB	California Air Resources Board
CFR	Code of Federal Regulations
CO	Carbon monoxide
CY	calendar year
°F	degrees Fahrenheit
FONSI	Finding of No Significant Impact
FY	fiscal year
HQ AMC	Headquarter Air Mobility Command
LTO	Landing take off
LZ	landing zone
m^3	Cubic meter
mg	Milligrams
NA	Not applicable
NAAQS	National Ambient Air Quality Standards
NDIR	Non-dispersive Infrared Photometry
NO_2	Nitrogen dioxide
NO_X	Nitrogen oxides
NSR	New Source Review
O_3	Ozone
Pb	Lead
PM	Particulate Matter
$PM_{2.5}$	Particulate matter less than 2.5 microns
PM_{10}	Particulate matter less than 10 microns
ppm	Parts per million
PSD	Prevention of significant deterioration
ROD	Record of Decision
SFBAAB	San Francisco Bay Area Air Basin
SIP	State Implementation Plan
SO_2	Sulfur dioxide
SO_X	Sulfur oxides

TGO	Touch and go
tpy	Tons per year
µg	Micrograms
USAF	United States Air Force
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency
VOC	Volatile organic compound
West Coast C-17 Basing EA	*Environmental Assessment West Coast Basing of C-17 Aircraft, June 2003*

SECTION 1
CLEAN AIR ACT CONFORMITY

1.1 INTRODUCTION

The Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (USEPA) to promulgate rules that ensure federal actions conform to the appropriate State Implementation Plan (SIP). These rules are codified in 40 Code of Federal Regulations (CFR) parts 6, 51, and 93. The SIP is a plan that provides for the implementation, maintenance, and enforcement of the National Ambient Air Quality Standards (NAAQS). This plan provides emission limitations and control measures to attain and maintain the NAAQS. Conformity to a SIP is defined as being consistent with the SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards.

A federal agency responsible for a proposed action is required to determine if its actions conform to the applicable SIP. If the action involves the Federal Highway Administration or Federal Transit Authority, it falls under Transportation Conformity Rules. All other federal actions fall under General Conformity Rules. Therefore, the action planned at Travis Air Force Base (AFB), California fall under the General Conformity rules and must conform to the SIP for the State of California.

1.2 CONFORMITY BACKGROUND INFORMATION

Section 176(c) of the CAA prohibits federal entities from taking actions in nonattainment or maintenance areas that do not conform to the SIP for the attainment and maintenance of the NAAQS. Therefore, the purpose of conformity is to:

- Ensure federal activities do not interfere with the emission budgets in the SIPs;
- Ensure federal actions do not cause or contribute to new violations; and
- Ensure attainment and maintenance of the NAAQS.

In November 1993, USEPA promulgated two sets of regulations to implement Section 176(c) of the CAA. First, on November 24, the USEPA promulgated the Transportation Conformity Regulations (applicable to highways and mass transit) to establish the criteria and procedure for determining that transportation plans, programs, and projects funded under Title 23 U.S.C. or the Federal Transit Act conform with the SIP (58 CFR 62.188). On November 30, the USEPA promulgated regulations, known as the General Conformity Regulations (applicable to everything else), to ensure that other federal actions also conformed to the SIPs (58 CFR 63.214).

With respect to General Conformity, all federal actions, like the proposed action at Travis AFB, are covered unless otherwise exempt. Actions considered exempt from General Conformity include:

- Actions covered by Transportation Conformity;

- Action with clearly *de minimis* emissions;
- Exempt actions listed in the rule; and
- Actions covered by a "Presumed to Conform" demonstration (an approved list).

Conformity can be demonstrated by:

- Showing emission increases are included in the SIP;
- The affected state agreeing to include increases in the SIP;
- No new violations of NAAQS and/or no increase in the frequency/severity of violations for areas without SIPs;
- Offsets; and
- Mitigation.

1.3 GENERAL CONFORMITY DETERMINATION PROCESS

The General Conformity Rule consists of three major parts – applicability, analysis, and procedure. These three parts are described in the following sections.

1.3.1 Applicability

Attainment Areas

The General Conformity Rule applies to federal actions occurring in air basins designated as nonattainment for criteria pollutants or areas designated as maintenance areas. Federal actions occurring in air basins that are in attainment of the NAAQS are not subject to the Conformity Rule.

A criteria pollutant is defined as a pollutant for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health and public welfare. A nonattainment area is any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant. A maintenance area is a redesignated nonattainment area for any air pollutant that has attained the national primary ambient air quality standard for that air pollutant. Criteria pollutants and designation of attainment status are further discussed in Section 3.2.

De Minimis Emissions Levels

Threshold (*de minimis*) rates of emissions were established in the final Rule to focus conformity requirements on those federal actions with the potential to have significant air quality impacts. With the exception of lead, the *de minimis* levels are based on the CAA's major stationary source definitions for the criteria pollutants (and precursor criteria pollutants) and vary by the severity of the nonattainment area. A conformity determination is required when the annual total of direct and indirect emissions from a federal action occurring in a nonattainment or maintenance area equals or exceeds the annual *de minimis* levels.

The *de minimis* level for ozone applies to each precursor, volatile organic compounds (VOC) and nitrogen oxides (NO_X). The *de minimis* level for $PM_{2.5}$ applies to each precursor (as deemed significant), SO_2, NO_X, and VOC or ammonia. Those levels specific to Air Quality Control Region (AQCR) 30, the region in which Travis AFB is located, are shown in bold type. Proposed Action at Travis AFB activities will occur in an area designated as marginal nonattainment for 8-hour ozone. The Proposed Action activities will occur in an area designated as marginal nonattainment for 8-hour ozone and maintenance for carbon monoxide. Table 1-1 lists the *de minimis* levels by pollutant applicable for federal actions in nonattainment areas. Table 1-2 lists the *de minimis* levels by pollutant applicable for federal actions in maintenance areas.

Table 1-1 *De Minimis* Levels for Criteria Pollutants in Nonattainment Areas

Pollutant	Designation	Tons/Year
Ozone*	Serious Nonattainment	50
	Severe Nonattainment	25
	Extreme Nonattainment	10
	Other nonattainment areas outside of ozone transport region	**100**
	Marginal and moderate nonattainment areas inside ozone transport region	50/100
Carbon Monoxide	All nonattainment areas	100
Sulfur Dioxide**	All nonattainment areas	100
Lead	All nonattainment areas	25
Nitrogen Dioxide	All nonattainment areas	100
Particulate Matter	Moderate nonattainment (PM_{10})	100
	Serious Nonattainment (PM_{10})	70
	Nonattainment ($PM_{2.5}$)	100

*includes precursors: VOC or NO_X
** Sulfur dioxide is often reported as sulfur oxides (SO_X)

Source: 40 CFR51.853.

Table 1-2 *De Minimis* Levels for Criteria Pollutants in Maintenance Areas

Pollutant	Designation	Tons/Year
Ozone (NOx)	All maintenance areas	100
Ozone (VOCs)	Maintenance areas inside an ozone transport region	50
	Maintenance areas outside of an ozone transport region	100
Carbon Monoxide	**All maintenance areas**	**100**
Sulfur Dioxide	All maintenance areas	100
Lead	All maintenance areas	25
Nitrogen Dioxide	All maintenance areas	100
Particulate Matter	All maintenance areas (PM_{10} and $PM_{2.5}$)	100

Source: 40CFR51.853

Regional Significance

A federal action that does not exceed the threshold rates of criteria pollutants may still be subject to a General Conformity determination. General Conformity applies if a federal action is considered to be "regionally significant", meaning the direct and indirect emissions of any pollutant represent ten (10) percent or more of a nonattainment or maintenance area's emissions inventory for that pollutant.

Exemptions and Presumptions

The final rule contains exemptions from the General Conformity process. Certain federal actions are deemed by the USEPA to conform because of the thorough air quality analysis required to comply with other statutory requirements. Examples of these actions include those subject to the New Source Review program, and remedial activities under the Comprehensive Environmental Response, Compensation and Liability Act.

Other federal actions that are exempt from the conformity process include those actions that would result in no increase in emissions, or an increase in emissions that is clearly *de minimis*. Examples include continuing or recurring activities, routine maintenance and repair, administrative and planning actions, land transfers, and routine movement of mobile assets.

A federal agency can establish its own presumptions of conformity through separate rulemaking actions. Section 176(c) of the CAA does not specifically exempt any activity, thus a separate analysis would need to show that the activity presumed to conform has no impacts to air quality. Based on this analysis, a federal agency can document that certain types of future actions would be *de minimis*.

1.3.2 Analysis

A conformity analysis for the federal action examines the impacts of the direct and indirect emissions from mobile and stationary sources, and emissions from any reasonably foreseeable federal action. Indirect emissions are those emissions of a criteria pollutant or its precursors that are caused by the federal action but may occur later in time and/or may be farther removed in distance from the action itself but are still reasonably foreseeable; and the federal agency can control and will maintain control over the indirect action due to a continuing program responsibility of the federal agency. Reasonably foreseeable emissions are projected future indirect emissions that are identified at the time the conformity determination is made; the location of such emissions is known and the emissions are quantifiable, as described and documented by the federal agency based on its own information and after reviewing any information presented to the federal agency.

The conformity determination procedure is detailed in 40 CFR 51.589. The analysis is based upon the latest planning assumptions, the latest emission estimation techniques, applicable air quality models, databases, and other requirements of the "Guideline on Air Quality Models (Revised)" (EPA Publication No. 450/2-78-027R, 1986), and on the total of direct and indirect emissions from the action. Finally, actions required to issue a conformity determination must list mitigation measures and go through the public notice process. Exempt actions are not required to go through this process.

1.3.3 Procedure

Procedural requirements of the conformity rule allow for public review of the federal agency's conformity determination. Although the conformity determination is a federal responsibility, state and local air agencies are provided notification and their expertise is

consulted. No documentation or public participation is required for applicability analyses that result in *de minimis* determinations.

The federal agency must provide a 30-day notice of the federal action and draft conformity determination to the appropriate USEPA Region, and state and local air control agencies. The federal agency must also make the draft determination available to the public to allow opportunity for review and comment.

The federal agency should consider aligning the conformity public participation requirements with those under the National Environmental Policy Act. However, the final rule does not require a concurrent process.

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SECTION 2
DESCRIPTION OF THE FEDERAL ACTION

The Air Force and Headquarters, Air Mobility Command (HQ AMC) have a need to establish landing zones (LZ) in the western United States at which C-17 tactical arrival, departure, and landing training could be accomplished by C-17 aircrews from Travis AFB. The Air Force is basing a total of 13 C-17 aircraft at Travis AFB. The first C-17 aircraft arrived at Travis AFB in fiscal year 2006 (FY06), with the 13th aircraft scheduled to arrive in FY08.

The action to base and operate C-17 aircraft at Travis AFB was assessed in an EA entitled *Environmental Assessment West Coast Basing of C-17 Aircraft, June 2003* (West Coast C-17 Basing EA) (USAF 2003). The Finding of No Significant Impact for the proposal was signed July 21, 2003.

An important element of C-17 basing is that aircrews have access to an airfield with a short runway, called an LZ 3,500 feet to 5,000 feet in length and 90 feet wide. The LZ is used to train and evaluate aircrews in conditions that closely approximate what they will experience in an operational environment. Air Force planning prior to initiation of the Travis AFB C-17 basing environmental impact analysis process identified the need for an LZ. The West Coast C-17 Basing EA states the following: "There are no LZs within a reasonable proximity to Travis AFB. As a result, an LZ needs to be identified. However, a location for the LZ has yet to be determined. Due to lack of available complete information, the proposed construction of an LZ will undergo analysis for decision-making at a later time. In this particular case, basing of C-17s at an active duty west coast Air Force base is ripe for decision. However, the decisions to identify, operate, and support an LZ for the Proposed Action have not been resolved at this time. As a result, analyses specific to the proposed LZ for the Proposed Action will be presented in a separate National Environmental Policy Act (NEPA) document that will include a cumulative impacts analysis of the entire Proposed Action (32 CFR 989.10)."

HQ AMC proposes to construct a permanent LZ in the western United States and then conduct recurring C-17 operations at the LZ. Construction and operation of a permanent LZ in the western United States would complete the west coast C-17 basing action initiated in 2003.

Two installations are being considered as the location at which the LZ would be constructed and operated: Travis AFB (Proposed Action); and Southern California Logistics Airport (formerly George AFB), Victorville, California (the alternative action). This Clean Air Act General Conformity Applicability Analysis applies to the Proposed Action at Travis AFB. Separate analysis has been accomplished for the Southern California Logistics Airport Alternative.

2.1 LOCATION OF THE FEDERAL ACTION

Travis AFB is located in north-central California, approximately 50 miles northeast of San Francisco and 40 miles south of Sacramento. Travis AFB is located about 4 miles

east of the City of Fairfield in Solano County. Figure 2-1 shows the general location of the base.

2.2 PURPOSE OF THE FEDERAL ACTION

The purpose of the proposed action is to construct an LZ in the western United States at which C-17 aircrews from Travis AFB can accomplish tactical arrival, departure, and landing training to ensure they are trained and are proficient in supporting all aspects of worldwide airlift missions.

2.3 ELEMENTS OF THE PROPOSED ACTION

A 3,500 foot-long, 90-foot wide LZ with 300 foot-long overruns at each end and connecting taxiways would be constructed 350 feet east of Runway 21Left/03Right on Travis AFB. It is estimated that construction of the LZ construction would begin in 2008 continue for about 12 months. Recurring C-17 operations would occur after LZ construction is completed.

Table 2-1 lists the projected annual and average daily LZ-related airfield operations. Air Force experience is that installations with aircrews who have a requirement for LZ training (to include both C-17 and C-130 aircraft) often send their aircrews to LZs other than the one primarily used for training because training at a variety of airfields increases training effectiveness and realism. Thus, C-17 and C-130 operations by aircraft from other installations would occur on the LZ in addition to C-17 operations accomplished by Travis AFB aircrews.

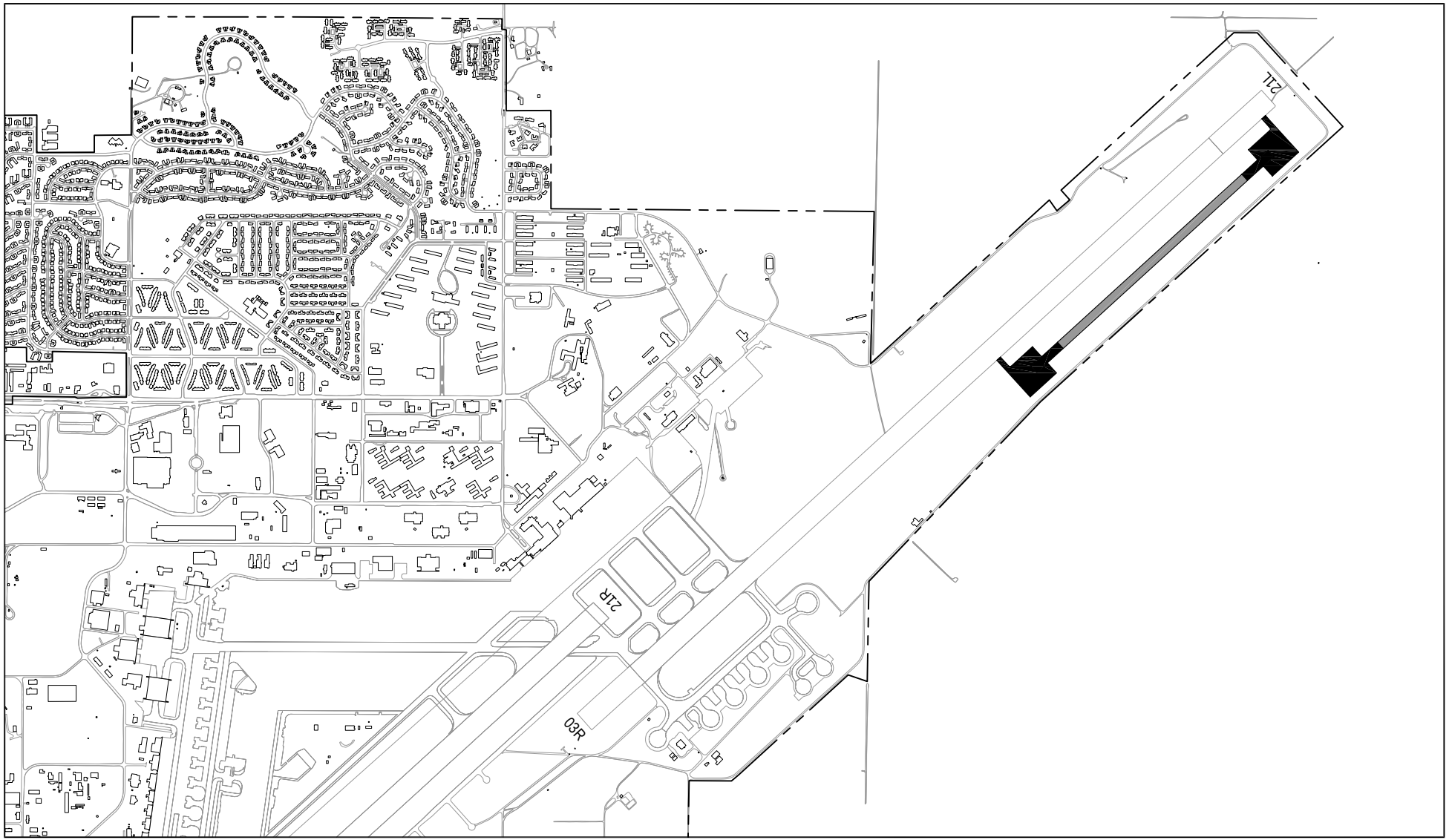
Table 2-1 Annual and Average Daily Landing Zone-Related Airfield Operations

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
C-17 LZ Related Operations	819	2.28	7,350	20.41	8,169	22.69
C-130 LZ Related Operations	300	0.83	3,445	9.57	3,745	10.40
Total	1,119	3.11	10,795	29.98	11,914	33.09

It is estimated the concrete portion of the LZ will be about 17 inches thick with 15 inches of aggregate base course. The asphalt portion of the LZ and the overruns and shoulders will be about 7 inches thick with 18 inches of aggregate base course.

It is estimated that about 6,000 truck trips would be necessary to haul construction materials (*e.g.*, cement, gravel for concrete, asphalt, etc.) to the construction site and from the batch plant to the LZ site. Altogether, trucks would travel about 43,000 miles to haul construction materials. Additionally, the batch plant and asphalt paver mixer would be operated about 109 and 148 hours, respectively, over the approximate 12-month construction period.

744211 WCLZ-TR-ALZ.DWG



Travis AFB

LEGEND

Proposed Landing Zone Location

Installation Boundary

N

0 2,000

Feet

Note:
Proposed LZ location is approximate.

Landing Zone Location, Proposed Action

Figure 2-1

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SECTION 3
EXISTING AIR QUALITY

Air quality is characterized by the existing concentrations of various air pollutants, and the climatic and meteorological conditions within an area. Precipitation, wind direction and speed (horizontal airflow), and atmospheric stability (vertical airflow) are factors that determine the extent of pollutant dispersion.

3.1 METEOROLOGICAL CONDITIONS

The San Francisco Bay Area is a large shallow basin surrounded by a series of mountain ranges and valleys. Travis AFB is located near the only major break in the coastal mountain range, near the Carquinez Straits. The Sierra-Nevada Mountains, located approximately 60 miles to the east, and the Sacramento and San Joaquin Valleys have a pronounced effect on local weather patterns.

Because of the major break in the coastal mountains, sea breezes often occur during the summer. The average annual wind speed is 12.3 knots. The wind averages 7.6 knots during the winter months and 14.3 knots during the summer months. During June through August, the predominant wind directions are from the southwest and west-southwest and typically have the highest average wind speed of 15 knots.

Travis AFB experiences mild temperatures with an average annual temperature of 60 degrees Fahrenheit (°F). The warmest months are July and August with a mean monthly temperature of 89°F and January is the coldest month with a mean monthly temperature of 38°F.

Temperatures in the atmosphere normally decrease as the altitude increases. Temperature inversions occur when temperatures at higher altitudes are higher than those at lower levels. Inversions in the San Francisco Bay Area Air Basin (SFBAAB) are frequent. The effect of a temperature inversion is to prevent pollutants from rising and being diluted vertically. Therefore, pollutants remain trapped in the lower layers of air and increase at ground level.

Travis AFB experiences moderate precipitation. Most of the precipitation falls during the winter months of December through March. The average precipitation during this time period is 4.1 inches per month. Throughout the rest of the year, the average precipitation is only 0.8 inches per month. The average annual precipitation is 23 inches.

Inversions can occur during the day or night. In the SFBAAB, inversions occur on over 90 percent of summer days, becoming most intense in the afternoons. During the winter, inversions occur on over 70 percent of the nights. The winter inversions are usually dissipated by daytime heating, bringing a rapid improvement to air quality by the afternoon. The heaviest pollution potential in the SFBAAB is during the fall, when both night and daytime inversions may occur together.

The inversion and wind speed together determine the ventilation or dilution factor for an area. Ventilation in the Bay Area is normally adequate to disperse most pollutants.

However, poor ventilation during the warm, sunny months fosters the development of photochemical ozone, creating a May-to-October ozone season.

3.2 CRITERIA POLLUTANTS AND STANDARDS

The NAAQS were established by the USEPA for six pollutants. Criteria pollutants are defined as those pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health. Criteria pollutants cause or contribute to air pollution which could endanger the public health or welfare. The USEPA has described the potential health and welfare effects of these pollutants. It is on the basis of these criteria and the health and welfare objectives that the standards are set or revised.

The six criteria pollutants are ozone (O_3), particulate matter ($PM_{2.5}$ and PM_{10}), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and lead (Pb). Even though ozone is a regulated criteria pollutant, it is not directly emitted from sources. Ozone forms as a result of VOCs and NO_x reacting with sunlight in the atmosphere.

The General Conformity Rule addresses the impact of the federal action on the area's attainment of the NAAQS. The NAAQS for the criteria pollutants are shown in Table 3-1.

Air quality is determined by comparing ambient air levels with the appropriate primary or secondary NAAQS for each criteria pollutant. National primary standards establish the level of air quality necessary to allow an adequate margin of safety to protect the public heath. National secondary standards establish the level of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

Areas not meeting ambient air quality standards are designated as being in nonattainment for the specific pollutant causing the violation. The CAA Amendments of 1990 (CAAA) further classified O_3, CO, and PM nonattainment areas based on the magnitude of the problem. Depending on the classification (e.g., ozone: marginal, moderate, serious, severe, or extreme), an area must adopt certain air pollution reduction measures. The classification also determines when the area must achieve attainment.

3.2.1 Ozone

Ozone is not emitted directly into the air but is formed through chemical reactions between natural and man-made emissions of VOC and NO_x in the presence of sunlight. Thus, VOC and NO_x are referred to as "precursors" of ozone. The level of ozone in the air depends on the outdoor levels of these organic gases, the radiant energy of the sun, and other weather conditions. The biggest concern with high ozone concentrations is the damage it causes to human health, vegetation and many common materials used everyday. High ozone concentrations can cause shortness of breath, coughing, wheezing, headaches, nausea, eye and throat irritations and lung damage.

3.2.2 Carbon Monoxide

Carbon monoxide is a colorless, odorless and tasteless toxic gas found naturally in trace quantities in the atmosphere and emitted from any form of combustion. At low concentrations, the central nervous system is affected. At higher concentrations, irritability, headaches, rapid breathing, blurred vision, lack of coordination, nausea and dizziness can all occur. It is especially dangerous indoors when ventilation is inadequate; unconsciousness or death can occur.

Table 3-1 National Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standards		
		Primary	Secondary	Method
Ozone (O_3)	1 Hour	No Standard	Same as Primary Standard	Ethylene Chemiluminescence
	8 Hour	0.08 ppm (157 µg/m^3)		
Respirable Particulate Matter (PM_{10})	24 Hour	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	Revoked		
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	65 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	15 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	None	Non-dispersive Infrared Photometry (NDIR)
	1 Hour	35 ppm (40 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
Lead	Average Calendar Quarter	1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	0.030 ppm (80 µg/m^3)	---	Pararosoaniline
	24 Hour	0.14 ppm (365 µg/m^3)	---	
	3 Hour	---	0.5 ppm (1300 µg/m^3)	

Source: USEPA, 2007

3.2.3 Nitrogen Dioxide

Nitrogen dioxide is a reddish-brown to dark brown poisonous gas that produces an irritating odor. It is a byproduct of high combustion sources. Health effects include

damage to lungs, bronchial and respiratory system irritation, headaches, nausea, coughing, choking and chest pains.

3.2.4 Sulfur Dioxide

Sulfur dioxide is a colorless gas with a strong suffocating odor. It is a gas resulting from the burning of sulfur-containing fuels. Exposure to SO_2 can irritate the respiratory system including lung and throat irritations and nasal bleeding. In the presence of moisture, SO_2 can form sulfuric acid that can cause damage to vegetation.

3.2.5 Suspended Particulate Matter

There are two categories of particulate matter: particles with diameters less than 10 microns and particles with diameters less than 2.5 microns in diameter. The sources of PM_{10} emissions include industrial and agricultural operations, automobile exhaust, and construction. Since PM_{10} is so small, it is not easily filtered and can penetrate to the deeper portions of the lungs. Chronic and acute respiratory illnesses may be caused from inhalation of PM_{10}.

3.2.6 Lead

Lead is a bluish-white to silvery gray solid. Lead particles can originate from motor vehicle exhaust, industrial smelters and battery plants. Health effects include decreased motor function, reflexes and learning; as well as, damage to the central nervous system, kidneys and brain. At high levels of exposure, seizures, coma or death may occur.

3.3 AIR QUALITY CONTROL REGION

The State of California is divided into a number of areas designated as air basins. Travis AFB is located in the SFBAAB, which includes the counties of Marin, San Francisco, San Mateo, Santa Clara, Alameda, Contra Costa, Napa, and portions of Sonoma and Solano. This area is known as Air Quality Control Region 30 (AQCR 30). The air basin is governed by the Bay Area Air Quality Management District (BAAQMD). Table 3-2 lists the air emissions for the SFBAAB for 2005 and is considered as the emissions inventory for this determination.

Table 3-2 2005 Emissions Inventory for AQCR 30 (tpy)

CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
807,636	141,109	199,619	19,710	77,928	33,033

Source: CARB 2006a.

3.3.1 Attainment Status

Areas not meeting ambient air quality standards are designated as being in nonattainment for the specific pollutant causing the violation. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.08 ppm or less. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile of monitored concentrations is

less than 150 μg/m^3. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of 98th percentiles is less than 65 μg/m^3. Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM_{10} is met if the 3-year average falls below the standard at every site. The annual $PM_{2.5}$ standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.

3.3.1.1 Ozone

On April 15, 2004, USEPA issued the first 8-hour ozone designations. Prior to that date, ozone attainment designations were determined by the 1-hour ozone standard of 0.12 ppm. The new 8-hour standard became effective 60 days after promulgation (June 15, 2004), while the existing 1-hour standard, for most purposes, remains in effect until USEPA determines an area has air quality meeting the 1-hour standard.

In relation to General Conformity, the proper *de minimis* threshold to use to determine conformity depends upon when the federal action begins. Actions beginning before June 15, 2005 must meet the 1-hour ozone *de minimis* threshold. Actions beginning on or after June 15, 2005 must meet the 8-hour ozone *de minimis* threshold. Since this Travis Alternative is scheduled to start after June 15, 2005, the 8-hour ozone threshold applies.

In 1997, the USEPA promulgated the 8-hour ozone standard. The federal 8-hour ozone standard at the Fairfield monitoring sites (Fairfield – Gregory Street and Fairfield – Chadbourne Road) has not been exceeded in the last 6 years. According to 40 CFR 81.305, this area has been designated as marginal nonattainment for the 8-hour ozone standard.

3.3.1.2 Particulate Matter

On January 5, 2005, USEPA issued the first $PM_{2.5}$ designations. Prior to that date, PM attainment designations were determined by the PM_{10} standard of 150 ug/m^3. The new $PM_{2.5}$ standard became effective 90 days after promulgation on April 5, 2005, while the existing PM_{10} standard, for most purposes, remains in effect until USEPA determines an area has air quality meeting the PM_{10} standard.

In relation to General Conformity, the proper *de minimis* threshold to use to determine conformity depends upon when the federal action Finding of No Significant Impact or Record of Decision is signed. Documents signed before April 5, 2006 must meet the PM_{10} *de minimis* threshold. Documents signed on or after April 5, 2006 must meet the $PM_{2.5}$ *de minimis* threshold.

According to 40 CFR 81.305, AQCR 30 has been designated as unclassifiable/attainment for $PM_{2.5}$ and as unclassifiable for PM_{10}.

3.3.1.3 Nitrogen Dioxide

According to 40 CFR 81.305, AQCR 30 has been designated as cannot be classified or better than national standards for NO_2.

3.3.1.4 Sulfur Dioxide

According to 40 CFR 81.305, AQCR 30 has been designated as better than national standards for SO_2.

3.3.1.5 Carbon Monoxide

According to 40 CFR 81.305, AQCR 30 has been designated as maintenance attainment for CO.

3.3.1.6 Lead

There is no information concerning lead in 40 CFR 81.305 for any part of California; therefore, the area has been designated as cannot be classified for lead.

3.4 TRAVIS AFB

As mentioned in the introduction to Section 2, the action to base C-17 aircraft at Travis AFB was environmentally assessed in 2003 in the West Coast C-17 Basing EA. The basing action included reducing the number of C-5s at Travis AFB from 37 to 16 aircraft as well as adding 13 C-17s. The number of KC-10 aircraft at Travis AFB was not affected by the basing action and the base continues to operate 27 KC-10s. Table 3-3 presents the emissions from the C-17, C-5, and KC-10 operations identified for the end state number of aircraft condition at Travis AFB in the West Coast C-17 Basing EA. The table also includes emissions for Navy E-6 and Coast Guard C-130 aircraft that are based at Travis AFB and which were included in the West Coast C-17 Basing EA.

Table 3-3 Emissions from Aircraft Operations Associated with the C-17 Basing Action at Travis AFB (tpy)

CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
384	175	1,378	59	104	103

See Appendix B.

The BAAQMD has allocated a USEPA-approved 2006 emissions budget for Travis AFB in the SIP. Table 3-4 lists the Travis AFB SIP budget.

Table 3-4 Travis AFB State Implementation Plan Emissions Budget Levels

CO (tpy)	VOC (tpy)	NO_X (tpy)
4,216	2,383	1,734

Source: BAAQMD 2007.

SECTION 4
ANALYSIS AND RESULTS

This section includes a comprehensive analysis of the resultant emissions from the federal action planned for Travis AFB. The purpose of this analysis is to determine whether the federal action will conform to the SIP as specified in Section 176(c) of the CAA. A positive conformity determination can be demonstrated by determining that the federal action does not increase emissions with respect to the current emissions. A discussion of the overall analytical methodology, emission changes by sources and conclusions of General Conformity are presented in this chapter. Appendix A contains supporting documentation for the emission calculations.

4.1 CONFORMITY DETERMINATION METHODOLOGY

4.1.1 Analytical Methods

The methodology for the General Conformity analysis for the federal action consisted of the following steps: (1) determine the pollutants of concern based on the attainment status of the air basin; (2) define the scope of the federal action; (3) calculate emissions based on the scope; (4) review net emission changes for *de minimis* threshold levels and regional significance; (5) determine conformity for applicable criteria pollutants. Chapter 2 describes the scope of the federal action.

The emission factors applied in the analysis are from the United States Air Force Institute for Environmental, Safety, & Occupational Health Risk Analysis (AFIERA) document *Air Emissions Inventory Guidance for Mobile Sources at Air Force Installations, January 2002 (Revised December 2003)*, referred to as the AFIERA document in this analysis and from USEPA Compilation of Air Pollutant Factors AP-42, Volume I.

4.1.2 Pollutants of Concern

The area affected by the federal action is in marginal nonattainment for 8-hour ozone as described in Section 3.3.1.1 and maintenance for CO as described in Section 3.3.1.5. Consequently, direct and indirect emissions of VOC and NO_X (precursors to ozone), as well as CO, resulting from the federal action are subject to the conformity determination. Thus, the following analysis will focus on only these pollutants.

4.1.3 Applicability

As discussed in Section 1.3.1, the federal action conforms for a criteria pollutant if the emissions for that pollutant do not exceed the *de minimis* thresholds specified in the final conformity rule (see Table 1-1). Conversely, if the total direct and indirect emissions of a pollutant exceed its *de minimis* threshold, a formal General Conformity Determination is required for that pollutant unless that pollutant has an applicable SIP budget. As will be shown in the following analysis, NO_X emissions will exceed *de*

minimis thresholds; however, the emissions will not cause Travis AFB to exceed the SIP budget for NO_X.

4.2 CHANGES IN EMISSIONS FOR THE PROPOSED ACTION

The federal action will affect the total amount of emissions from several categories of sources. The analysis includes all sources subject to the change in emission rates, exclusive of any stationary sources that are subject to review and that may require a permit under the New Source Review (NSR) or Prevention of Significant Deterioration (PSD) programs. The emissions associated with increase in airfield operations and construction activities are included in the analysis.

4.2.1 Airfield Operations

Airfield operations generate the greatest volume of criteria pollutant emissions at Travis AFB. The federal action will result in an increase in the number of airfield operations at Travis AFB. Thus, the change in emissions resulting from the change in the number of aircraft operations for most of the criteria pollutants is greater than the change associated with construction activity.

4.2.1.1 Methodology

The LZ-related airfield operations at Travis AFB have been established, and the types of aircraft that will be training at Travis AFB are used to calculate emission rates. The rate of emissions varies according to the type of aircraft operation. Thus, the analysis is based on two types of activities: landing-and-takeoff operations (LTO); and touch-and-go operations (TGO). LTO and TGO operations data for the C-17s and C-130s associated with the Proposed Action were provided by the Air Force (USAF 2006).

Emissions from LTOs and TGOs for the specific aircraft were determined using the AFIERA document. Modal emission rates are pollutant emission factors by type of aircraft operation such as taxi/idle, takeoff, climbout, and approach. Total taxi/idle times were based upon the AFIERA document modal times. Emissions can be calculated by using the time an aircraft spends in each mode, the number of engines on the aircraft, the number of operations, and the modal emission rate. Emissions from TGOs were calculated similar to the LTOs, except that emissions resulting from taxi/idle were excluded since these modes are not part of a TGO.

4.2.1.2 Results

The emissions resulting from the LZ-related airfield operations were calculated for the different components of the federal action. Table 4-1 summarizes the anticipated cumulative net change in emissions from LZ-related airfield operations. The results show an increase in all pollutant emissions.

Table 4-1 Change in Emissions Resulting from Landing Zone-Related Airfield Operations (tons/year)

	Pollutants Emitted (tons/year)					
	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
C-17 Aircraft Emissions	+10.39	+1.80	+119.34	+5.53	+24.81	+24.56
C-130 Aircraft Emissions	+2.07	+0.45	+4.44	+0.52	+1.62	+1.61
Net Change in Emissions	+12.46	+2.25	+123.78	+6.05	+26.43	+26.17

See Appendix A.

4.2.2 Construction

Only construction for the LZ is planned at Travis AFB. Emissions from construction activity are considered short-term area emissions, while emissions from vehicles supporting construction are considered mobile sources.

4.2.2.1 Methodology

Emission factors from the USEPA were used to calculate construction emissions. These factors include on-site construction equipment and workers' travel. Concrete batch plant operations, including truck trips for materials and hauling to the LZ construction area are also included.

4.2.2.2 Results

Table 4-2 summarizes the net emission changes from anticipated from construction activities. An increase in emissions is logical. The USEPA watering factor for reducing particulate matter emissions has been applied in these calculations.

Table 4-2 Change in Construction Emissions Associated with the Travis AFB Proposed Action (tons/year)

Type of Construction	Pollutants Emitted (tons/year)					
	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Total Landing Zone Construction Activities Emissions (FY08)	+55.82	+3.62	+20.83	+2.39	+13.22	+2.52

See Appendix A.

4.2.3 Summary of Results

Construction emissions are short-term and would be completed prior to initiation of LZ-related aircraft operations. As a result, construction emissions are not combined with long-term, LZ-related recurring aircraft operations emissions for determination of regional significance or for comparison with *de minimis* thresholds. Table 4-3 summarizes the net change in emissions from LZ-related recurring airfield operations and construction operations. Table 4-4 compares the net change in emissions from the Travis AFB Proposed Action recurring LZ-related aircraft operations with *de minimis* thresholds for AQCR 30 and states whether or not the emissions exceed *de minimis* or would be regionally significant.

Table 4-3 Net Change in Emissions from Proposed Action (tons/year)

Category	Pollutants Emitted (tons/year)					
	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Short-Term Emissions						
Construction*	**+55.82**	**+3.62**	**+20.83**	+2.39	+13.22	+2.52
Long-Term Recurring Emissions						
Airfield Operations	**+12.46**	**+2.25**	**+123.78**	+6.05	+26.43	+26.17

*FY 07 Construction Emissions represent the extreme condition.
Bold indicates pollutants of concern for Travis AFB Conformity Determination.

Table 4-4 Regional Significance Analysis and Comparison to Conformity *de minimis* Thresholds for Proposed Action Recurring Aircraft Operations Emissions in AQCR 30

Category	Pollutants Emitted (tons/year)					
	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Emissions Inventory	807,636	141,109	199,619	19,710	77,928	33,033
Emissions from Recurring Aircraft Operations	**12.46**	**2.25**	**123.78**	6.05	26.43	26.17
Net Change in Emissions from Recurring Aircraft Operations as Percent 0f Inventory	0.0015%	0.0016%	0.0620%	0.0307%	0.0339%	0.0792%
de minimis Threshold	100	100	100	NA	NA	NA
Net Change in Emissions from Recurring Aircraft Operations Exceed *de minimis* Threshold?	No	No	**Yes**	NA	NA	NA
Net Change in Emissions from Recurring Aircraft Operations Regionally Significant? (>10%)	No	No	No	NA	NA	NA

NA – Not Applicable. *De minimis* does not apply since AQCR is in attainment for pollutant.
Bold indicates pollutants of concern for Travis AFB Conformity Determination.

As discussed in the introduction to Section 2, operation of a permanent LZ in the western United States would complete the west coast C-17 basing action initiated in 2003. Table 4-5 lists the emissions from recurring aircraft operations for the completed C-17 basing action at Travis AFB (*i.e.*, basing action emissions plus LZ operations emissions) and compares the combined emissions with the USEPA-approved SIP budget emissions levels for Travis AFB. Appendix B contains a detailed comparison of the emissions with the SIP budget.

Table 4-5 Comparison of Recurring Aircraft Emissions to Travis AFB SIP Budget Emissions Levels (tpy)

	CO	VOC	NO_X
Emissions from Basing Action Recurring Aircraft Operations	384	175	1,378
Emissions from Proposed Action Recurring LZ Operations	12	2	124
Combined Recurring Aircraft Operations Emissions	396	177	1,502
SIP Budget Emissions	4,216	2,383	1,734
Comparison of Combined Recurring Aircraft Emissions to SIP Budget	-3,820	-2,206	-232

Note: Negative numbers indicate a surplus in SIP budget See Appendix B for additional information.

4.3 CONFORMITY DETERMINATION RESULTS

As explained in Section 4.1.3, a conformity determination is required if the total direct and indirect emissions of a pollutant from the federal action exceed the *de minimis* threshold established in the final rule. The emissions must be compared to the air quality emissions inventory of the air basin to determine regional significance of the federal action when the total nonattainment criteria pollutant emissions do not exceed the *de minimis* thresholds. The federal action is considered regionally significant in regards to that particular pollutant if the amount of emissions is greater than 10 percent of the emissions inventory. Regionally significant actions must be further reviewed to determine conformity.

Construction emissions are short-term, would be completed prior to initiation of aircraft operations, would not exceed *de minimis* thresholds, and would not be regionally significant. As a result, only recurring aircraft operations emissions are considered for comparison with *de minimis* thresholds and for determination of regional significance.

4.3.1 *De minimis* Levels and Regional Significance

De Minimis Levels

Table 4-4 summarizes the federal action recurring emissions and compares them to the *de minimis* thresholds. As a result of the action, emissions for NO_X would increase by 123.78 tpy, VOC emissions would increase by 2.25 tpy, and CO emissions would increase by 12.46 tpy. This federal action conforms to the applicable SIP when criteria pollutants do not exceed the respective *de minimis* thresholds of 100 tpy for CO, NO_X and VOC. However, the increase of 123.78 tons per year in NO_X emissions exceeds the *de minimis* threshold.

Regional Significance

The federal action is not considered to be regionally significant because the NO_X, VOC, and CO emissions are less than 10 percent of the emissions inventory (see Table 4-4).

4.3.2 Analysis

The federal action will occur within an air basin designated as marginal nonattainment for 8-hour ozone and maintenance for carbon monoxide as described in Section 3.3.1.5. The General Conformity Rule also extends to the precursors of ozone. Thus, this conformity determination focuses on only the criteria pollutants of NO_X, VOC, and CO.

The emissions for CO, VOC and NO_X would be less than 10 percent of the emissions inventory and the action would not be considered regionally significant (see Table 4-4). While the total of direct and indirect CO and VOC emissions are below the *de minimis* thresholds established for these pollutants, the total of direct and indirect NO_X emissions exceed the *de minimis* threshold established for this pollutant (see Table 4-4). While the total of direct and indirect NO_X emissions exceed the *de minimis* threshold established for this pollutant, the total direct and indirect NO_X emissions do not exceed the established SIP budget for NO_X (see Table 4-5).

4.4 CONCLUSION

As discussed in the introduction to Section 2, operation of a permanent LZ in the western United States would complete the west coast C-17 basing action initiated in 2003. Although the NO_X emissions from recurring LZ aircraft operations exceed the *de minimis* threshold (see Table 4-4), the combined NO_X emissions from recurring aircraft operations for the completed C-17 basing action at Travis AFB (*i.e.*, basing action emissions plus LZ operations emissions) will not exceed the NO_X emissions level in the USEPA-approved SIP budget for the base (see Table 4-5).

Based on the information in the preceding paragraph, it is determined that the Proposed Action at Travis AFB positively conforms to the SIP for the base. The Air Force is supporting an activity demonstrated by USEPA standards not to cause or contribute to new violations of any NAAQS in the affected area, nor increase the frequency or severity of an existing violation. Implementation of the federal action would not delay timely attainment of pollutant standards in any area of the AQCR, and the action would be in compliance or would be consistent with all relevant requirements and milestones contained in the applicable SIP. This conclusion of positive General Conformity determination for the Proposed Action at Travis AFB fulfills the Air Force's obligation and responsibility under 40 CFR Part 93, Subpart B. A Conformity Determination would not be required.

SECTION 5
REFERENCES

40 Code of Federal Regulations, Part 50 – National Primary and Secondary Ambient Air Quality Standards, July 2006.

40 Code of Federal Regulations, Part 51 – Requirements for Preparation, Adoption, and Submittal of Implementation Plans, July 2006.

40 Code of Federal Regulations, Part 81 – Designation of Areas for Air Quality Planning Purposes, July 2006.

40 Code of Federal Regulations, Part 93 – Determining Conformity of Federal Actions to State or Federal Implementation Plans, July 2006.

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APPENDIX A
PROPOSED ACTION EMISSIONS CALCULATIONS

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LANDING ZONES

Travis AFB

Project #	Project Description	N/R	Bldg ft2	#	Asp ft2	thick	Con ft2	thick	demo ft2	area dist	mo	CY
1	Cement Concrete Touchdown Area	N	0	0	0	0	151,525	32.04	0	3.48	12	
2	Asphalt Concrete Pavement Area	N	0	0	306,800	24.96	0	0	0	7.04	12	
3	Asphalt Concrete Shoulders	N	0	0	329,400	24.96	0	0	0	7.56	12	
Notes:					636,200	49.92	151,525	32.04		18.08		

1 Based on 5,000 ft long and 90 feet wide LZ
2 Based on 2 taxiways, 300 ft long and 90 feet wide (concrete)
3 Assume 12 months for construction

Estimated Pollutant Emissions from Construction Activities

New Construction or Renovation (N/R)	N			
(enter "N" for new, "R" for renovation)				
Building Square Footage	-	ft^2	**No. Stories**	0
Asphalt Area	636,200.0	ft^2	**Depth**	50 **inches**
Concrete Area	151,525.0	ft^2	**Depth**	32 **inches**
Demolition Building Area	-	ft^2		
Total Area of Site	18.084	**Acres (area disturbed by ground breaking)**		
Ground Disturbing Activity	12	**Months**		

Construction Emissions

Construction Activity	CO (tons)	VOC (tons)	NO_X (tons)	SO_X (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)
Site Preparation/Ground Disturbance	0.02	0.01	0.06	0.01	9.99	1.70
New Building Construction	-	-	-	-	-	-
Existing Building Renovation	-	-	-	-	-	-
Building Demolition	-	-	-	-	-	-
Asphalt Paving Operations	49.95	2.49	7.11	0.90	2.05	0.35
Concrete Paving Operations	5.83	1.02	13.66	1.49	0.85	0.14
Total Emissions	**55.80**	**3.52**	**20.83**	**2.39**	**12.89**	**2.19**

Travis AFB Landing Zone Construction Emissions

Plant Wide Emission Factors Per Yard of Central Mix Concrete

	Controlled PM10 (lb/yd3)	Total yd3	Total PM10 lbs	Total PM10 tons	
aggregate delivery to ground storage	0.0031	42359.49	131.314419	0.06565721	
sand delivery to ground storage	0.0007	42359.49	29.651643	0.014825822	
aggregate transfer to conveyor	0.0031	42359.49	131.314419	0.06565721	
sand transfer to conveyor	0.0007	42359.49	29.651643	0.014825822	
sand transfer to elevated storage	0.0031	42359.49	131.314419	0.06565721	
cement delivery to silo	0.0007	42359.49	29.651643	0.014825822	
cement supplement delivery to silo	0.0001	42359.49	4.235949	0.002117975	
weigh hopper loading	0.0002	42359.49	8.471898	0.004235949	
central mix loading	0.0038	42359.49	160.966062	0.080483031	
				0.328286048	Total Tons PM10

	CO	VOC	NOX	SOX	PM10	PM2.5
Batch Plant Operations Emissions	0	0	0	0	0.33	0.32

Table 11.12-6 (English Units) Plant Wide Emission Factors per Yard of Central Mix Concrete
AP-42 (Fifth Edition, Volume I), Chapter 11.12 Concrete Batching

Model Year of Vehicle = 2005, Calendar Year of Use = 2007

	g/mi	Total Miles	total grams	total lbs	total tons
Table 4-38. VOC Emission Factors for Low Altitude HDDV	2.0	44,167	88334.89	194.75	0.10
Table 4-39. CO Emission Factors for Low Altitude HDDV	10.4	1,808	18802.72	41.45	0.02
Table 4-40. NOX Emission Factors for Low Altitude HDDV	6.5	109	707.91	1.56	0.00
Table 4-50. Average Emission Factors for On-Road Vehicles - PM10 Total (ex and fug.)	7.73	257	1984.34	4.37	0.00
Table 4-50. Average Emission Factors for On-Road Vehicles - PM2.5 Total (ex and fug.)	2.01	6,192	12445.32	27.44	0.01
Table 4-50. Average Emission Factors for On-Road Vehicles - SOX	0.512	6,044	3094.48	6.82	0.00

	CO	VOC	NOX	SOX	PM10	PM2.5
Truck Traffic Emissions (tons)	0.02	0.10	0.00	0.00	0.00	0.01

Travis	CO (tons)	VOC (tons)	NO_X (tons)	SO_X (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)
AQCR Baseline	847,275	150,709	204,364	26,134	68,949	28,470
Proposed Action Emissions[b]	55.82	3.62	20.83	2.39	13.22	2.52
Construction Emissions as % of Baseline	0.01	0.00	0.01	0.01	0.02	0.01

	CO (tons)	VOC (tons)	NO_X (tons)	SO_X (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)
Travis	55.80	3.52	20.83	2.39	12.89	2.19
Batch Plant Operations	0.00	0.00	0.00	0.00	0.33	0.32
Truck Trips	0.02	0.10	0.00	0.00	0.00	0.01
Totals:	**55.82**	**3.62**	**20.83**	**2.39**	**13.22**	**2.52**

Average Construction Equipment Usage Rates (hours)									Equipment Emission Factors				
	New Construction		Existing Facilities			Paving Operations		Site Prep	(from AP-42, Volume 2 - Mobile Sources)				
Construction Equipment	Single Story (per 1,000 ft^2)	Multi-Story (per 1,000 ft^2)	Single Story (per 1,000 ft^2)	Multi-Story (per 1,000 ft^2)	Demolition (per 1,000 ft^2)	Asphalt (per 1,000 yd^3)	Concrete (per 1,000 yd^3)	per acre	CO (lb/hr)	VOC (lb/hr)	NO_X (lb/hr)	SO_X (lb/hr)	PM_{10} (lb/hr)
Backhoe	2.690	2.194	0.666	0.225	-	-	-		0.572	0.291	1.890	0.182	0.172
Blower	-	-	-	-	-	16.000	-		12.100	0.410	0.320	0.017	0.021
Bulldozer	1.183	1.387	0.372	0.106	-	6.154	16.000	2.500	0.346	0.148	1.260	0.137	0.112
Concrete Truck	7.528	3.764	0.753	0.376	-	-	203.262		1.794	0.304	4.166	0.454	0.256
Crane	10.334	15.545	1.894	1.040	3.000	-	-		0.346	0.148	1.260	0.137	0.112
Dump Truck	4.228	3.401	0.961	0.239	7.960	10.954	40.129	0.500	1.794	0.304	4.166	0.454	0.256
Front-end Loader	2.680	2.518	0.771	0.184	4.000	-	16.000	0.500	0.572	0.291	1.890	0.182	0.172
Paver	-	-	-	-	-	8.000	-		0.675	0.183	1.691	0.143	0.139
Roller	-	-	-	-	-	23.906	-		0.304	0.083	0.862	0.067	0.050
Scraper	-	-	-	-	-	4.800	-		0.151	0.052	0.713	0.086	0.061
Striper	-	-	-	-	-	16.000	-		12.100	0.410	0.320	0.017	0.021
18-Wheel Truck	28.080	30.055	5.268	2.484	-	-	182.166	0.100	1.794	0.304	4.166	0.454	0.256

Construction Equipment Emission Factors								
	New Construction		Existing Facilities			Paving Operations		Site Prep
Pollutant	Single Story (lb/1,000 ft^2)	Multi-Story (lb/1,000 ft^2)	Single Story (lb/1,000 ft^2)	Multi-Story (lb/1,000 ft^2)	Demolition (lb/1,000 ft^2)	Asphalt (lb/1,000 yd^3)	Concrete (lb/1,000 yd^3)	lb per acre
CO	78.523	75.326	14.131	6.192	17.607	422.373	778.137	2.227
VOC	15.378	15.192	2.876	1.231	4.028	21.059	136.393	0.698
NO_X	190.619	185.298	34.657	15.133	44.502	101.185	1,823.269	6.595
SO_X	20.641	20.075	3.742	1.639	4.753	9.509	198.307	0.706
PM_{10}	12.412	12.235	2.288	0.992	3.062	6.765	113.486	0.520

Asphalt Paving Emission Factors (lb/ton asphalt)				
CO	VOC	NO_X	SO_X	PM_{10}
0.340	0.017	0.025	0.005	0.020

Unit Weight of Asphalt = 130.00 lb/ft^3

Proposed Action C-17 LZ Operations at Travis AFB

C-17	Aircraft Cycle Mode	Power Setting	Fuel Cnsmpt. (lb/hr)	Emission Rates, lb/1000 lb Fuel Burned					LTO (# of landing and takeoff)	TGO (# of touch and go)	LTO Time in Mode		TGO Time in Mode		Emissions (tons/year)					
Engine ID				CO	VOC	NOX	SOX	PM10			(min)	(hr)	(min)	(hr)	CO	VOC	NOX	SOX	PM10	PM2.5
F117-PW-100	Taxi/Idle-out	Idle	1,104	23.86	2.15	3.96	0.96	10.54	410		9.2	0.153333			3.3120	0.2984	0.5497	0.1333	1.4631	1.4484
Input	Take-off	Military	13,976	0.4	0.03	34.3	0.96	2.31	410	3675	0.4	0.006667	0.4	0.0066667	0.3045	0.0228	26.1101	0.7308	1.7584	1.7408
# Engines	Climbout	Intermediate	10,919	0.36	0.21	30.02	0.96	2.31	410	3675	1.2	0.02	1.2	0.02	0.6423	0.3747	53.5606	1.7128	4.1214	4.0802
4	Approach	Approach	4,279	1.25	0.3	13.03	0.96	5.52	410	3675	5.1	0.085	5.1	0.085	3.7144	0.8915	38.7193	2.8527	16.4030	16.2389
	Taxi/Idle-in	Idle	1,104	23.86	2.15	3.96	0.96	10.54	410		6.7	0.111667			2.4120	0.2173	0.4003	0.0970	1.0655	1.0548
	APU Start														0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Project Emissions															**10.39**	**1.80**	**119.34**	**5.53**	**24.81**	**24.56**
		Sample Calculation: Fuel Consumpt (lb/hr) x Emission Rate (lb of Pollutant/1000lb) x LTO x No. Engines x TIM (hr) x (tons/2000 lb) + Fuel Consumpt (lb/hr) x Emission Rate (lb/1000 lb) x TGO x TIM (hr) x (tons/2000 lb)																	

PM2.5 fraction from Air Resources Board PM Profile ID 112
California Emission Inventory and Reporting System (CEIDARS)
9/26/2002

Proposed Action C-130 LZ Operations at Travis AFB

C-130	Aircraft	Power	Fuel	Emission Rates, lb/1000 lb Fuel Burned					LTO (# of landing and takeoff)	TGO (# of touch and go)	LTO Time in Mode		TGO Time in Mode		Emissions (tons/year)					
Engine ID	Cycle Mode	Setting	Cnsmpt. (lb/hr)	CO	VOC	NOX	SOX	PM10			(min)	(hr)	(min)	(hr)	CO	VOC	NOX	SOX	PM10	PM2.5
T56-A-9	Taxi/Idle-out	Ground Idle	725	5.62	2.25	7.47	0.96	3.64	150		9.2	0.153333			0.1874	0.0750	0.2491	0.0320	0.1214	0.1202
Input	Take-off	Int Mil	2,068	2.51	0.35	11.19	0.96	1.22	150	1723	0.4	0.006667	0.4	0.006667	0.1296	0.0181	0.5778	0.0496	0.0630	0.0624
# Engines	Climbout	Normal RTD	1,724	2.44	0.51	9.39	0.96	1.46	150	1723	1.2	0.02	1.2	0.02	0.3151	0.0659	1.2125	0.1240	0.1885	0.1866
4	Approach	Flight Idle	949	4.30	0.77	7.35	0.96	3.85	150	1723	5.1	0.085	5.1	0.085	1.2990	0.2326	2.2204	0.2900	1.1630	1.1514
	Taxi/Idle-in	Ground Idle	725	5.62	2.25	7.47	0.96	3.64	150		6.7	0.111667			0.1365	0.0546	0.1814	0.0233	0.0884	0.0875
	APU Start														0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Project Emissions															**2.07**	**0.45**	**4.44**	**0.52**	**1.62**	**1.61**
		Sample Calculation: Fuel Consumpt (lb/hr) x Emission Rate (lb of Pollutant/1000lb) x LTO x No. Engines x TIM (hr) x (tons/2000 lb) + Fuel Consumpt (lb/hr) x Emission Rate (lb/1000 lb) x TGO x TIM (hr) x																		

PM2.5 fraction from Air Resources Board PM Profile ID 112
California Emission Inventory and Reporting System (CEIDARS)
9/26/2002

APPENDIX B
Comparison of Emissions at Travis AFB for Landing Zone Construction and Recurring Aircraft Operations with State Implementation Plan

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Emissions from C-17 Aircraft Operations after C-17 Basing is Complete

C-17	Aircraft Cycle Mode	Power Setting	Fuel Cnsmpt. (lb/hr)	Emission Rates, lb/1000 lb Fuel Burned					LTO (# of landing and takeoff)	TGO (# of touch and go)	LTO Time in Mode		TGO Time in Mode		Emissions (tons/year)					
Engine ID				CO	VOC	NOX	SOX	PM10			(min)	(hr)	(min)	(hr)	CO	VOC	NOX	SOX	PM10	PM2.5
F117-PW-100	Taxi/Idle-out	Idle	1,104	23.86	2.15	3.96	0.96	10.54	1092		9.2	0.153333			8.821	0.795	1.464	0.355	3.897	3.858
Input	Take-off	Military	13,976	0.4	0.03	34.3	0.96	2.31	1092	2404	0.4	0.006667	0.4	0.006667	0.261	0.020	22.342	0.625	1.505	1.490
# Engines	Climbout	Intermediate	10,919	0.36	0.21	30.02	0.96	2.31	1092	2404	1.2	0.02	1.2	0.02	0.550	0.321	45.831	1.466	3.527	3.491
4	Approach	Approach	4,279	1.25	0.3	13.03	0.96	5.52	1092	2404	5.1	0.085	5.1	0.085	3.178	0.763	33.132	2.441	14.036	13.896
	Taxi/Idle-in	Idle	1,104	23.86	2.15	3.96	0.96	10.54	1092		6.7	0.111667			6.424	0.579	1.066	0.258	2.838	2.809
	APU Start														0.000	0.000	0.000	0.000	0.000	0.000
Emissions															**19.23**	**2.48**	**103.84**	**5.15**	**25.80**	**25.54**
		Sample Calculation: Fuel Consumpt (lb/hr) x Emission Rate (lb of Pollutant/1000lb) x LTO x No. Engines x TIM (hr) x (tons/2000 lb) + Fuel Consumpt (lb/hr) x Emission Rate (lb/1000 lb) x TGO x TIM (hr) x (tons/2000 lb)																		

Emissions from C-5 Aircraft Operations after C-17 Basing is Complete

C-5	Aircraft Cycle Mode	Power Setting	Fuel Cnsmpt. (lb/hr)	Emission Rates, lb/1000 lb Fuel Burned					LTO (# of landing and takeoff)	TGO (# of touch and go)	LTO Time in Mode		TGO Time in Mode		Emissions (tons/year)					
Engine ID				CO	VOC	NOX	SOX	PM10			(min)	(hr)	(min)	(hr)	CO	VOC	NOX	SOX	PM10	PM2.5
TF39-GE-1A/1C	Taxi/Idle-out	Idle	1,448	58.21	16.43	3.36	0.96	2.75	821		9.2	0.153333			21.221	5.990	1.225	0.350	1.003	0.993
Input	Take-off	Military	13,861	1.28	0	32.66	0.96	1.18	821	7580	0.4	0.006667	0.4	0.006667	1.987	0.000	50.705	1.490	1.832	1.814
# Engines	Climbout	Intermediate	12,541	1.63	0	28.16	0.96	0.89	821	7580	1.2	0.02	1.2	0.02	6.869	0.000	118.667	4.045	3.750	3.713
4	Approach	Approach	10,477	0.77	0.67	24.72	0.96	1.19	821	7580	5.1	0.085	5.1	0.085	11.521	10.025	369.862	14.364	17.805	17.627
	Taxi/Idle-in	Idle	1,448	58.21	16.43	3.36	0.96	2.75	821		6.7	0.111667			15.455	4.362	0.892	0.255	0.730	0.723
	APU Start														0.000	0.000	0.000	0.000	0.000	0.000
Emissions															**57.05**	**20.38**	**541.35**	**20.50**	**25.12**	**24.87**
		Sample Calculation: Fuel Consumpt (lb/hr) x Emission Rate (lb of Pollutant/1000lb) x LTO x No. Engines x TIM (hr) x (tons/2000 lb) + Fuel Consumpt (lb/hr) x Emission Rate (lb/1000 lb) x TGO x TIM (hr) x (tons/2000 lb)																		

Emissions from KC-10 Aircraft Operations after C-17 Basing is Complete

KC-10	Aircraft Cycle Mode	Power Setting	Fuel Cnsmpt. (lb/hr)	Emission Rates, lb/1000 lb Fuel Burned					LTO (# of landing and takeoff)	TGO (# of touch and go)	LTO Time in Mode		TGO Time in Mode		Emissions (tons/year)					
Engine ID				CO	VOC	NOX	SOX	PM10			(min)	(hr)	(min)	(hr)	CO	VOC	NOX	SOX	PM10	PM2.5
F103-GE-100	Taxi/Idle-out	Idle	1,706	61.79	21.8	3.6	0.96	2.75	2720		19	0.316667			136.170	48.042	7.933	2.116	6.060	6.000
Input	Take-off	Military	19,738	0.5	0.6	36.54	0.96	1.18	2720	13225	0.7	0.011667	0.7	0.011667	2.754	3.304	201.243	5.287	6.499	6.434
# Engines	Climbout	Intermediate	15,675	0.5	0.7	29.79	0.96	0.89	2720	13225	2.2	0.036667	2.2	0.036667	6.873	9.622	409.498	13.196	12.234	12.112
3	Approach	Approach	5,238	4.3	1	9.5	0.96	1.19	2720	13225	4	0.066667	4	0.066667	35.912	8.352	79.341	8.018	9.939	9.839
	Taxi/Idle-in	Idle	1,706	61.79	21.8	3.6	0.96	2.75	2720		7	0.116667			50.168	17.700	2.923	0.779	2.233	2.210
	APU Start														0.000	0.000	0.000	0.000	0.000	0.000
Emissions															**231.88**	**87.02**	**700.94**	**29.40**	**36.96**	**36.59**
		Sample Calculation: Fuel Consumpt (lb/hr) x Emission Rate (lb of Pollutant/1000lb) x LTO x No. Engines x TIM (hr) x (tons/2000 lb) + Fuel Consumpt (lb/hr) x Emission Rate (lb/1000 lb) x TGO x TIM (hr) x (tons/2000 lb)																		

Emissions from Navy E-6 Aircraft Operations after C-17 Basing is Complete

Navy E-6	Aircraft Cycle Mode	Power Setting	Fuel Cnsmpt. (lb/hr)	Emission Rates, lb/1000 lb Fuel Burned					LTO (# of landing and takeoff)	TGO (# of touch and go)	LTO Time in Mode		TGO Time in Mode		Emissions (tons/year)					
Engine ID				CO	VOC	NOX	SOX	PM10			(min)	(hr)	(min)	(hr)	CO	VOC	NOX	SOX	PM10	PM2.5
TF33-P-5	Taxi/Idle-out	Idle	1,120	95.06	90.91	1.39	0.96	4.98	618		19	0.316667			41.671	39.852	0.609	0.421	2.183	2.161
Input	Take-off	Military	9,630	0	0.55	12.08	0.96	3.67	618	1533	0.7	0.011667	0.7	0.011667	0.000	0.266	5.839	0.464	1.774	1.756
# Engines	Climbout	Intermediate	8,960	2.11	1.5	7.88	0.96	3.15	618	1533	2.2	0.036667	2.2	0.036667	2.982	2.120	11.137	1.357	4.452	4.408
4	Approach	Approach	4,140	5.24	1.37	6.37	0.96	3.55	618	1533	4	0.066667	4	0.066667	6.222	1.627	7.563	1.140	4.215	4.173
	Taxi/Idle-in	Idle	1,120	95.06	90.91	1.39	0.96	4.98	618		7	0.116667			15.353	14.682	0.224	0.155	0.804	0.796
	APU Start						0.96								0.000	0.000	0.000	0.000	0.000	0.000
Emissions															**66.23**	**58.55**	**25.37**	**3.54**	**13.43**	**13.29**
		Sample Calculation: Fuel Consumpt (lb/hr) x Emission Rate (lb of Pollutant/1000lb) x LTO x No. Engines x TIM (hr) x (tons/2000 lb) + Fuel Consumpt (lb/hr) x Emission Rate (lb/1000 lb) x TGO x TIM (hr) x (tons/2000 lb)																	

Emissions from Transient Aircraft Operations after C-17 Basing is Complete

Transient	Aircraft Cycle Mode	Power Setting	Fuel Cnsmpt. (lb/hr)	Emission Rates, lb/1000 lb Fuel Burned					LTO (# of landing and takeoff)	TGO (# of touch and go)	LTO Time in Mode		TGO Time in Mode		Emissions (tons/year)					
Engine ID				CO	VOC	NOX	SOX	PM10			(min)	(hr)	(min)	(hr)	CO	VOC	NOX	SOX	PM10	PM2.5
PT6A-41	Taxi/Idle-out	Idle	147	115.12	101.46	1.96	0.96	0	2822		6.5	0.108333			2.587	2.280	0.044	0.022	0.000	0.000
Input	Take-off	Military	510	5.1	1.75	7.98	0.96	0	2822	562	0.6	0.01	0.6	0.01	0.044	0.015	0.069	0.008	0.000	0.000
# Engines	Climbout	Intermediate	473	6.48	2.02	7.55	0.96	0	2822	562	5	0.083333	5	0.083333	0.432	0.135	0.504	0.064	0.000	0.000
1	Approach	Approach	273	34.77	22.69	4.64	0.96	0	2822	562	4.6	0.076667	4.6	0.076667	1.231	0.804	0.164	0.034	0.000	0.000
	Taxi/Idle-in	Idle	147	115.12	101.46	1.96	0.96	0	2822		6.5	0.108333			2.587	2.280	0.044	0.022	0.000	0.000
	APU Start														0.000	0.000	0.000	0.000	0.000	0.000
Emissions															**6.88**	**5.51**	**0.82**	**0.15**	**0.00**	**0.00**
		Sample Calculation: Fuel Consumpt (lb/hr) x Emission Rate (lb of Pollutant/1000lb) x LTO x No. Engines x TIM (hr) x (tons/2000 lb) + Fuel Consumpt (lb/hr) x Emission Rate (lb/1000 lb) x TGO x TIM (hr) x (tons/2000 lb)																	

Emissions from Coast Guard C-130 Aircraft Operations after C-17 Basing is Complete

CG C-130	Aircraft Cycle Mode	Power Setting	Fuel Cnsmpt. (lb/hr)	Emission Rates, lb/1000 lb Fuel Burned					LTO (# of landing and takeoff)	TGO (# of touch and go)	LTO Time in Mode		TGO Time in Mode		Emissions (tons/year)					
Engine ID				CO	VOC	NOX	SOX	PM10			(min)	(hr)	(min)	(hr)	CO	VOC	NOX	SOX	PM10	PM2.5
T56-A-9	Taxi/Idle-out	Ground Idle	725	5.62	2.25	7.47	0.96	3.64	678		9.2	0.153333			0.8472	0.3392	1.1260	0.1447	0.5487	0.5432
Input	Take-off	Int Mil	2,068	2.51	0.35	11.19	0.96	1.22	678	1086	0.4	0.006667	0.4	0.006667	0.1221	0.0170	0.5443	0.0467	0.0593	0.0587
# Engines	Climbout	Normal RTD	1,724	2.44	0.51	9.39	0.96	1.46	678	1086	1.2	0.02	1.2	0.02	0.2968	0.0620	1.1423	0.1168	0.1776	0.1758
4	Approach	Flight Idle	949	4.30	0.77	7.35	0.96	3.85	678	1086	5.1	0.085	5.1	0.085	1.2237	0.2191	2.0917	0.2732	1.0957	1.0847
	Taxi/Idle-in	Ground Idle	725	5.62	2.25	7.47	0.96	3.64	678		6.7	0.111667			0.6170	0.2470	0.8201	0.1054	0.3996	0.3956
	APU Start														0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Emissions															**3.11**	**0.88**	**5.72**	**0.69**	**2.28**	**2.26**
		Sample																		

	CO	VOC	NOX	SOX	PM10	PM2.5
TOTAL EMISSIONS AFTER C-17 BASING IS COMPLETE	**384.38**	**174.82**	**1,378.05**	**59.42**	**103.60**	**102.56**

Comparison of Emissions at Travis AFB for Landing Zone Construction and Recurring Aircraft Operations with State Implementation Plan

line		tons per year					
		CO	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**
1	Emissions from aircraft operations prior to initiation of C-17 basing action (from Table 3.1.2-3 of USAF 2003)	**222.76**	**48.66**	**1,825.74**	0.34	79.10	nc
2	Emissions from aircraft operations after basing action is completed (see Appendix B)						
3	C-17	**19.23**	**2.48**	**103.84**	5.15	25.80	25.54
4	C-5	**57.05**	**20.38**	**541.35**	20.50	25.12	24.87
5	KC-10	**231.88**	**87.02**	**700.94**	29.40	36.96	36.59
6	Navy E-6	**66.23**	**58.55**	**25.37**	3.54	13.43	13.29
7	Coast Guard C-130	**3.11**	**0.88**	**5.72**	0.69	2.28	2.26
8	transient	**6.88**	**5.51**	**0.82**	0.15	0.00	0
9	Total	**384.38**	**174.82**	**1,378.04**	59.43	103.59	102.55
10	Net change in emissions associated with basing action in USAF 2003	**161.62**	**126.16**	**-447.70**	59.09	24.49	nc
11	Emissions from Landing Zone (LZ) Project						
12	construction	**55.82**	**3.62**	**20.83**	2.39	13.22	2.52
13	recurring aircraft operations						
14	C-17	**10.39**	**1.80**	**119.34**	5.53	24.81	24.56
15	C-130	**2.07**	**0.45**	**4.44**	0.52	1.62	1.61
16	subtotal	**12.46**	**2.25**	**123.78**	6.05	26.43	26.17
17	Emissions from LZ Conformity Analysis (line 12 + line 16)	**68.28**	**5.87**	**144.61**	8.44	39.65	28.69
18	Recurring aircraft operations emissions (line 9)	**384.38**	**174.82**	**1,378.04**	59.43	103.59	102.55
19	Recurring aircraft operations emissions from LZ Project (line 16)	**12.46**	**2.25**	**123.78**	6.05	26.43	26.17
20	Combined recurring aircraft operations emissions (line 18 + line 19)	**396.84**	**177.07**	**1,501.82**	65.48	130.02	128.72
21	Net change when compared to prior to basing action (line 20 - line 1)	**174.08**	**128.41**	**-323.92**	65.14	50.92	128.72
22	Recurring aircraft operations emissions (line 9)	**384.38**	**174.82**	**1,378.04**	59.43	103.59	102.55
23	Recurring aircraft ops emissions from LZ Project (line 16)	**12.46**	**2.25**	**123.78**	6.05	26.43	26.17
24	LZ Project construction emissions (line 12)	**55.82**	**3.62**	**20.83**	2.39	13.22	2.52
25	Combined total emissions (line 22 + line 23 + line24)	**452.66**	**180.69**	**1,522.65**	67.87	143.24	28.69
26	Net change when compared to prior to basing action (line 25 - line 1)	**229.90**	**132.03**	**-303.09**	67.53	64.14	28.69
27	Combined recurring aircraft operations emissions (line 9 + line 13)	**396.84**	**177.07**	**1,501.82**	65.48	130.02	128.72
28	Travis AFB budget in State Implementation Plan (SIP)	**4,215.75**	**2,383.45**	**1,733.75**	NA	NA	NA
29	Recurring aircraft operations emissions compared to SIP budget (line 27 - line 28)	**-3,818.91**	**-2,206.38**	**-231.93**	NB	NB	NB
30	Combined emissions for aircraft operations after C-17 basing is complete + LZ project (line 9 + line 17)	**452.66**	**180.69**	**1,522.65**	67.87	143.24	131.24
31	Travis AFB budget in SIP	**4,215.75**	**2,383.45**	**1,733.75**	NA	NA	NA
32	Emissions for recurring aircraft operations after C-17 basing is complete + LZ Project construction and aircraft operations emissions compared to SIP budget (line 31 - line 32)	**-3,763.09**	**-2,202.76**	**-211.10**	NB	NB	NB

nc=not calculated; NA=not applicable because pollutant is not one of concern. NB=pollutant not in SIP budget.

Bold indicates pollutants of concern

Reference: USAF 2003. United States Air Force, Air Mobility Command, *Environmental Assessment West Coast Basing of C-17 Aircraft*, June 2003.

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APPENDIX D
SECTION 7 CONSULTATION, BIOLOGICAL ASSESSMENT, AND BIOLOGICAL OPINION

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

FILE COPY

5 February 2008

David H. Musselwhite
60th Civil Engineer Squadron
411 Airmen Drive
Travis AFB, CA 94535

Ms Michelle Tovar
Fish & Wildlife Biologist
Endangered Species Division
U.S. Fish & Wildlife Service
2800 Cottage Way, Suite W2605
Sacramento, Ca 95825-3901

Dear Ms Tovar

Travis AFB is requesting formal Section 7 consultation with the U.S. Fish and Wildlife Service for potential affects to the listed California Tiger Salamander (CTS) as the result of permanent and temporary removal of upland habitat and to certain listed invertebrate species as the result of indirect effects of an altered hydrological regime. The proposed project is located in the vicinity of an area on Travis AFB identified as the preferred alternative for the West Coast C-17 Assault Landing Strip. The total project area is comprised of about 54.4 acres and located adjacent to one of the base's main runways. The Assault Landing Strip is necessary to provide specialized training for C-17 aircrews in association with the previously approved beddown on Travis AFB of a squadron of C-17 aircraft.

We had previously initiated informal consultations with you concerning potential impacts to the CTS as a result of this proposed project, as well as discussions regarding development of a CTS programmatic agreement to implement a comprehensive strategy for management of CTS populations and habitat on base. We would hope that the CTS conservation measures that arise from the consultation process for this project could be integrated into the programmatic agreement.

A Biological Assessment, Wetlands Delineation and a draft Environmental Assessment have been developed for this project and are attached. The Biological Assessment concludes, in part, that:

> The proposed action may adversely affect the CTS by permanently removing 24.7 acres of upland habitat and temporarily removing 29.7 acres of upland habitat, but this removal would not represent an adverse modification of habitat essential for recovery of this species with the inclusion of conservation measures that will reduce the adverse effects in the proposed action.

Listed invertebrate animal species included in the Biological Assessment may be affected, but not adversely affected by the proposed action as a result of the indirect effects of an altered hydrological regime. The increase in impervious cover will increase the total volume of water leaving the base, and increase flow rates and velocity in Denverton Creek, which diffuses onto the Wilcox Ranch. Breeding habitat for the CTS will also be subject to these indirect effects.

The Contra Costa goldfield will not be adversely affected by the proposed action. Habitat for the species will be removed but removal will not represent an adverse modification of habitat essential to the recovery of this species.

The Wetlands Delineation indicates that there are 3.45 acres of wetlands within the action area. The wetland features include vernal pools, seasonal wetlands and drainage ditches. A preliminary determination suggests that the wetlands are jurisdictional waters of the United States. Of the 3.45 acres delineated, 0.61 acre will be permanently removed and 2.84 acres will be subject to indirect effects due to increased surface flows and increased hydrological connectivity.

The Air Force would propose mitigating for the impacts to CTS upland and breeding habitat taken during construction through purchase of preservation credits and for impact to vernal pool habitat through purchase of preservation credits within a Service-approved ecosystem preservation and a vernal pool creation bank. I and my staff stand ready to assist you with any actions necessary to complete the formal consultation process for this project. If you have any questions please call me at (707) 424-7515.

Sincerely,

DAVID H. MUSSELWHITE, YF-02, DAF
Chief, Environmental Flight

Attachments:
1. Biological Assessment
2. Pre-jurisdictional Waters of the U.S. Report
3. Draft Environmental Assessment

FINAL
Biological Assessment
Construction and Operation of a Permanent Southwestern United States C-17 Landing Zone at Travis Air Force Base, Solano County, California



Department of the Air Force
Air Mobility Command
Scott Air Force Base, Illinois

November 2007

FINAL
Biological Assessment
Construction and Operation of a Permanent Southwestern United States C-17 Landing Zone at Travis Air Force Base, Solano County, California

Department of the Air Force
Air Mobility Command
Scott Air Force Base, Illinois

November 2007

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ACRONYMS AND ABBREVIATIONS

AFB	Air Force base
AMC	Air Mobility Command
ARB	Air Reserve base
BA	Biological Assessment
BASH	Bird/Wildlife Aircraft Strike Hazard
BMP	best management practice
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
DFG	Department of Fish and Game
EA	environmental assessment
EOS	end of system
ESA	Endangered Species Act
ft/sec	feet per second
FONSI	finding of no significant impact
FR	Federal Register
HA	Hydrological Assessment
HQ	headquarters
IC	Impervious cover
INRMP	Integrated Natural Resources Management Plan
LZ	landing zone
T&E	threatened and endangered
the Base	Travis AFB, California
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

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SECTION 1
INTRODUCTION

1.1 PURPOSE AND NEED OF THE PROPOSED ACTION

The Air Force and Headquarters, Air Mobility Command (HQ AMC) have a need to construct a landing zone (LZ) in the southwestern United States at which C-17 tactical arrival and landing training could be accomplished by C-17 aircrews from two California bases (Travis Air Force Base [AFB] and March Air Reserve Base [ARB]). Figure 1.1 shows the general location of the Proposed Action, sited at Travis AFB, Solano County, California (the Base).

The action to base and operate 13 C-17 aircraft at the Base was assessed in an environmental assessment (EA) entitled *Environmental Assessment West Coast Basing of C-17 Aircraft*, June 2003 (USAF 2003a). The Finding of No Significant Impact (FONSI) for the proposal was signed July 21, 2003. Likewise, an EA entitled *Environmental Assessment for the Beddown of C-17 Aircraft at March Air Reserve Base, California* (March ARB Basing EA) was accomplished to base eight C-17s, and the FONSI was signed March 31, 2003 (USAF 2003b). These National Environmental Policy Act documents were subject to separate Section 7 consultations pursuant to the Endangered Species Act (ESA).

1.2 SECTION 7 ENDANGERED SPECIES ACT CONSULTATION

The Air Force entered into informal consultation with United States Fish and Wildlife Service (USFWS) for this project in 2006. The project would directly and indirectly impact vernal pools and associated listed species in the action area. Additionally, the project would disturb and remove California tiger salamander upland habitat. In accordance with 50 Code of Federal Register (CFR) 402.12 (c), a species list was obtained from the USFWS Sacramento Ecological Services Field Office (via an online query system) on April 6, 2007. In accordance with 50 CFR 402.12 (e), the species list was verified in July 2007, 90 days after receipt of the original species list.

This Biological Assessment (BA) considers how the Proposed Action (described in Section 2) may affect listed species populations, habitat, and recovery efforts within the action area. Section 3 provides a description of the action area. Section 4 discusses the threatened and endangered (T&E) species associated with the action area. Section 5 includes an analysis of the direct and indirect effects of the Proposed Action on species and/or critical habitat, along with descriptions of conservation measures designed to reduce these effects. Section 6 is the compilation of references used to obtain the Proposed Action description and to assess effects of the Proposed Action on listed species.

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Figure 1.1
Location of Travis AFB

Biological Assessment
Permanant Southwestern U.S. C-17 Landing Zone,
Travis AFB

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SECTION 2
DESCRIPTION OF THE PROPOSED ACTION

It is estimated that construction of the LZ at the Base would begin in late spring or early summer 2008 and that recurring aircraft operations would begin after construction of the LZ is completed in 2009. The activities of the Proposed Action considered in this BA are grouped into two main categories, construction and operations, and are discussed in more detail in Subsections 2.1 and 2.2. Figure 2.1 shows the location of the Proposed Action at the Base, including contractor staging and hauling access routes.

2.1 CONSTRUCTION ACTIVITIES

For the purposes of this BA, construction activities are divided into four categories: LZ construction, contractor staging and hauling operations, batch plant construction and operation, and utility infrastructure installment. The total construction footprint of these categories amounts to 54.4 acres. Table 2.1 lists each construction activity with the associated size of the construction footprint.

Table 2.1 Construction Activities and Associated Acreages

Construction Activity	Description	Footprint Size (acres)
LZ construction	Paving of runway surfaces	17.3
	Grading activities of runway perimeter	7.6
	Non-paved area of disturbance associated with construction activities	22.1
	Total acreage of runway construction activities	47.0
Contractor staging and hauling[1]	Contractor staging on Travis AFB	0
	Hauling road	0
	Total acreage contractor and hauling activities	0
Batch plant construction and operation	Batch plant	6.9
	Access roads	0.5
	Total acreage batch plant construction and operation	7.4
Utility infrastructure[2]	Installation of electric lines and lighting	0
	Total of All Construction Activities	54.4

1 Contractor staging area will be on existing developed areas on Travis AFB
2 Utility infrastructure will be installed on existing surfaces or on existing planned surfaces

2.1.1 LZ Construction

Land associated with activities for construction of the LZ amounts to 47.0 acres. The approximate anticipated grading limits (disturbed areas) are as shown on Figure 2.2. These limits extend from 125 feet to 145 feet of the LZ centerline along all edges, with the exception of the north side. The entire area on the north side of the LZ, between Runway 03Right-21Left (03R-21L) and the LZ, will be disturbed due to construction activities in the area.

Grading limits were established through a conservative conceptual design of the new LZ and connector taxiways, borrowed from the design of a separate project to resurface Runway 03R-21L. Although it is currently anticipated that the Runway 03R-21L Reconstruction Project will not be accomplished concurrently with LZ construction, the final reconstructed Runway 03R-21L profile grade was used as a baseline for tying in the new connector taxiways. The Runway 03R-21L Reconstruction Project will not add additional surface nor disturb the area as significantly as the LZ construction; thus, it is included as part of the LZ construction discussion. Because the new LZ finished grade surface is approximately 18 inches higher than the existing surface of Runway 03R-21L, the proposed grade provides a more conservative analysis, *i.e.,* the grading limits extend farther to match the existing ground at the proposed toe-of-slope.

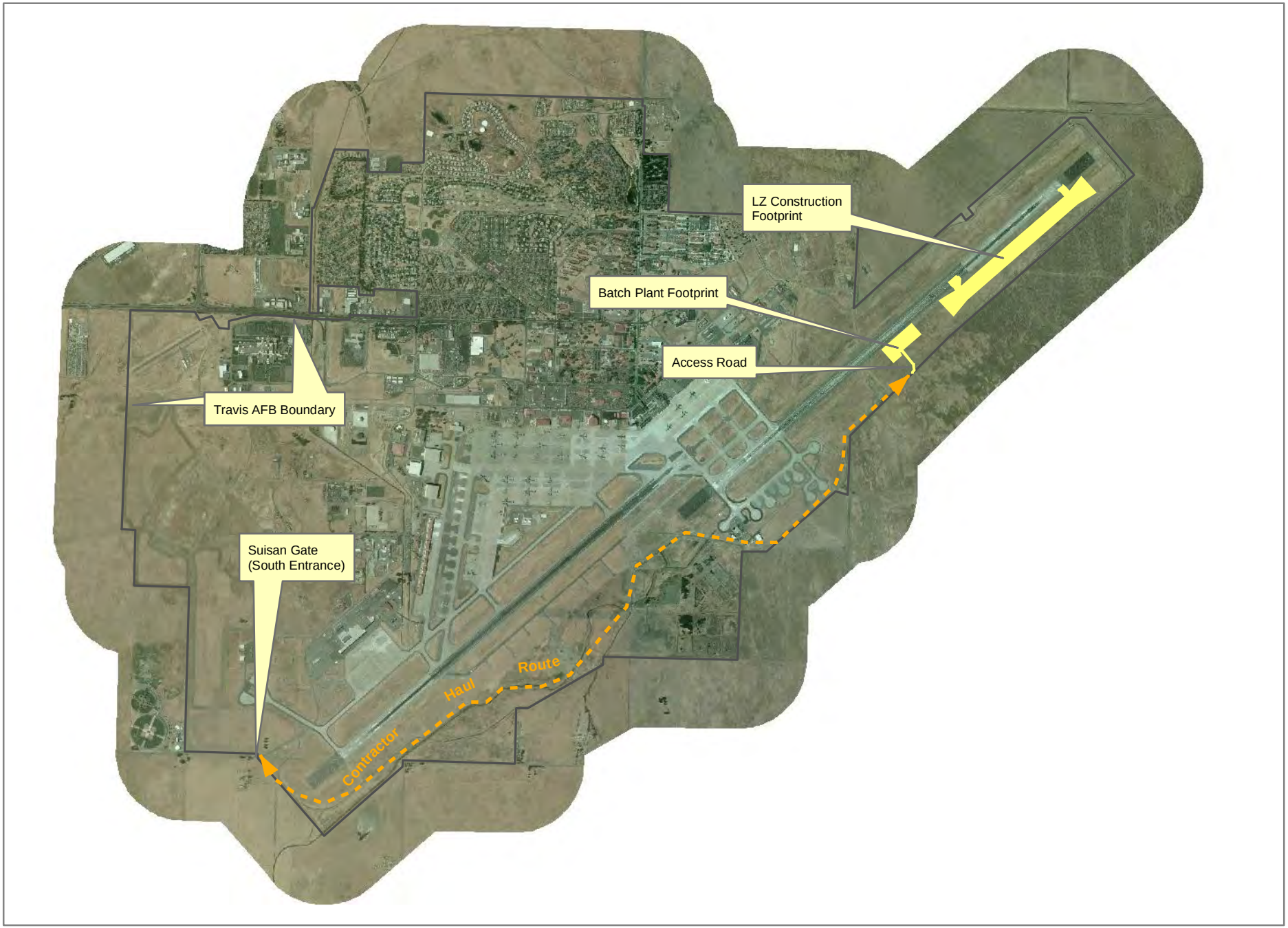
The Wilcox Ranch, adjacent to the Base on the east, is a preservation area under restricted land use. Stormwater runoff will drain from the LZ to the Wilcox Ranch via drainage features on the northeast corner of Travis AFB, which currently channel overland flow from the existing runway. The runoff is channeled to Denverton Creek, which diffuses on Wilcox Ranch.

2.1.2 Contractor Staging and Hauling Operations

Hauling operations will take place on the existing Perimeter Road, as shown on Figure 2.1. As such, no impacts to surrounding areas are anticipated from hauling operations, except in the immediate vicinity of the LZ near the Batch Plant.

2.1.3 Batch Plant Construction and Operation

The Batch Plant will occupy 7.5 acres. This area includes the anticipated disturbance associated with construction of the only new haul road under this project. The new haul road connects the existing Perimeter Road/haul route to the Batch Plant/staging area, as shown on Figure 2.1. The Batch Plant and haul route will be dismantled and the area associated with the plant and route will be revegetated.



0 1 2 Kilometers

0 1 2 Miles

Figure 2.1
Location of the Proposed Action

Biological Assessment
Permanant Southwestern U.S. C-17 Landing Zone,
Travis AFB, Solano County, California

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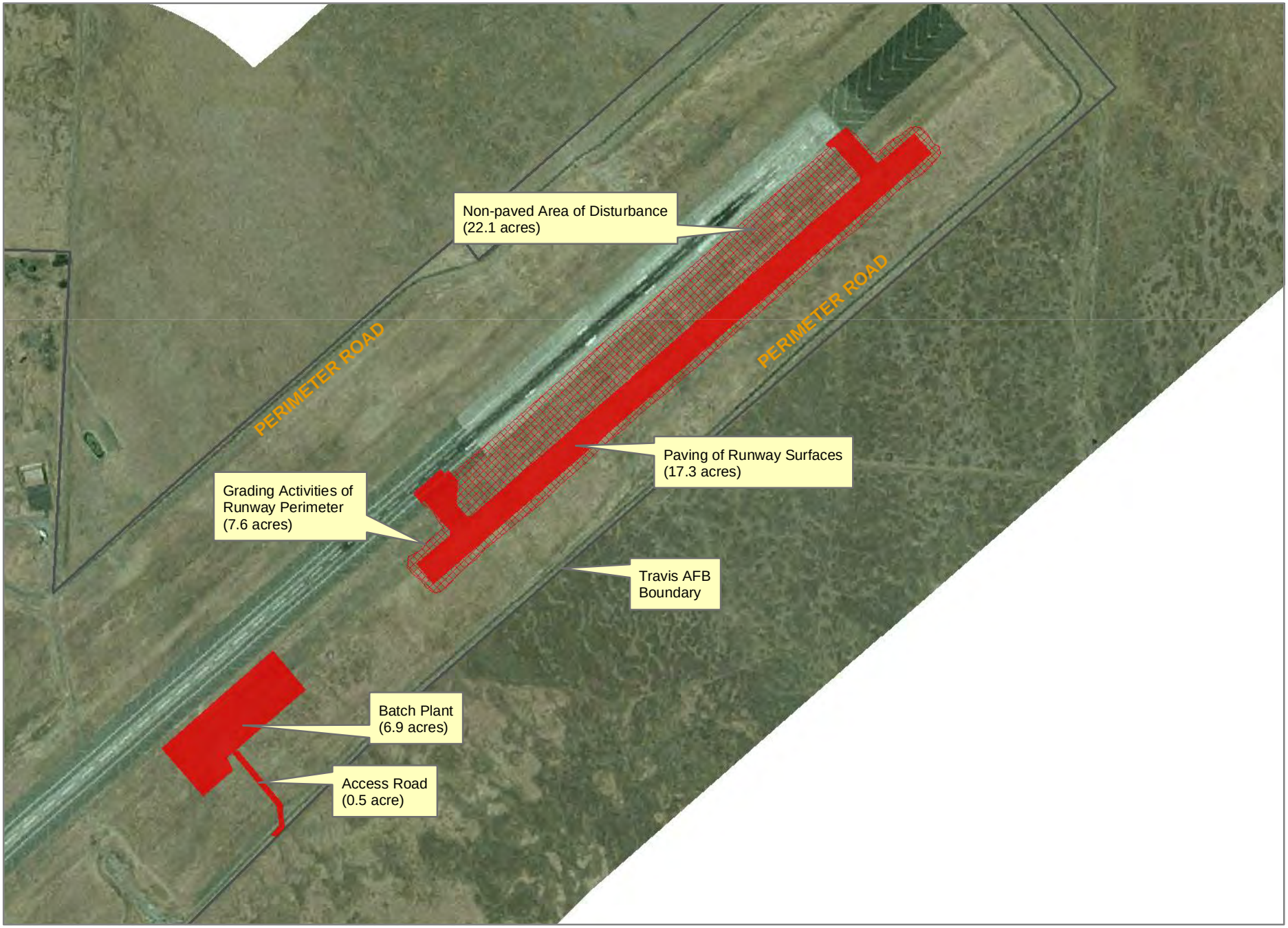


Figure 2.2
Runway Construction and Paving

Biological Assessment
Permanant Southwestern U.S. C-17 Landing Zone,
Travis AFB, Solano County, California

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2.1.4 Utility Infrastructure Construction

Activities associated with the installation of electrical systems for the LZ will not occur outside the LZ footprint. New cable for the LZ will be pulled through the existing 4W4-inch civil engineering duct bank that runs along Runway 03R/21L on its south side. No new conduit lines or handholes/manholes will be installed outside the main footprint of the LZ. New conduit for lights alongside the LZ will be installed, but these impacts will be included within the grading limits identified in the LZ footprint, shown on Figure 2.2.

2.2 LANDING ZONE OPERATIONS

Table 2.2 lists the projected recurring annual and average daily airfield operations for the Base after the LZ construction. Operations include tactical arrivals and landings on the LZ as well as departures from the main runway that become a closed pattern to the LZ. Aircrews typically do not depart from the LZ but, instead, taxi to and depart from the main runway after landing on the LZ. Average daily airfield operations at the Base would increase by 50.72 operations from 221.81 to 272.53 operations, a 23 percent increase. Approximately 89,100 annual operations would occur under the Proposed Action. The anticipated annual operations would equate to approximately 32 percent of the airfield capacity, an increase of 7 percent. Assuming nearly all operations occur primarily between 6:00 a.m. and 2:00 a.m., there would be 20 hours of operations per day for hourly capacity purposes. Based on a 20-hour day, the average hourly operations would be about 14 operations, approximately 26 percent of the hourly capacity (a 6 percent increase). About 11 percent of the operations would occur in the evening (7:00 p.m. to 10:00 p.m.) and 29 percent would occur at nighttime (10:00 p.m. to 7:00 a.m.).

Table 2.2 Proposed Action Annual and Average Daily Airfield Operations

	Arrival and Departure Operations		Closed Pattern Operations		Total Operations	
Aircraft	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**	**Annual**	**Avg. Daily**
C-17 LZ Related Operations	1,452	4.03	13,064	36.29	14,516	40.23
C-130 LZ Related Operations	300	0.83	3,445	9.57	3,745	10.40
Based and Transient Aircraft	17,501	48.12	53,318	173.69	70,819	221.81
Total	19,253	52.98	69,827	219.55	89,080	272.53

2.3 CONSERVATION MEASURES

Conservation measures are included as part of the Proposed Action, and are designed to avoid and minimize adverse effects to listed species. Further, the conservation

measures correspond to some recovery actions outlined in various USFWS recovery plans for listed species and vernal pool habitat. Conservation measures are listed below and are discussed in more detail in Subsection 5.4:

- Conservation easements and mitigation bank credit purchases to offset direct effects of California tiger salamander upland habitat removal, as well as direct effects to vernal pools;
- Hydrological designs to limit the indirect effects of increased impervious cover of the LZ to the existing drainage from the Base to the Wilcox Ranch;
- Vegetation management in the on-Base portion of the action area to reduce effects associated with upland habitat removal; and
- Integration of conservation measures into California tiger salamander programmatic agreements.

SECTION 3
DESCRIPTION OF THE ACTION AREA

This BA addresses possible effects of the Proposed Action in all areas subject to the direct effects associated with construction (LZ, Batch Plant, new access roads necessary during the construction phase, and new road accesses during the subsequent operational phases of the project), as well as the indirect effects associated with hydrological modifications. Noise effects and aircraft operations are not expected to affect listed species discussed in Section 4; therefore this BA does not include the effects of noise. Because California tiger salamanders have the potential to migrate within the action area from adjacent upland and breeding habitat on the Wilcox Ranch (Jepson Prairie), to upland habitat, the effects of the Proposed Action may impact California tiger salamanders found off Base. Rainfall runoff from impermeable surfaces that will be constructed for the Proposed Action may affect listed crustaceans that inhabit vernal pools off Base. In accordance with 50 CFR 402.02, the action area contains portions within the construction footprint, down the slope gradient to Perimeter Road, and portions on the Wilcox Ranch that would receive increased overland flow contributions exiting the Base from the northeast corner of the Base boundary.

Keeler-Wolf (1998) grouped California vernal pools into discrete regional complexes representative of the range of biotic and abiotic features characteristic of ephemeral systems. The Proposed Action occupies a remnant portion of the Solano-Colusa Vernal Pool Region, characterized by periodic alkaline basins surrounded by upland herbaceous-dominant vegetation of the Sacramento Valley (USFWS 2005). Descriptions of this vernal pool region serve as a regional context for the action area.

3.1 THE SOLANO-COLUSA VERNAL POOL REGION

The Solano-Colusa Vernal Pool Region is a relatively large area covering the majority of Solano County, ranging northward from the low-lying plains adjacent to the Suisun Marsh and the Sacramento-San Joaquin Delta through the Colusa Basin of western Sacramento Valley to the vicinity of Princeton, Glenn County. It is best known for well-represented examples of Northern claypan pools between Highway 113 and the Base. This is the only known region to contain the ESA-listed (threatened) Delta green ground beetle and the grass *Tuctoria mucronata*, which distinguish this region from any other vernal pool region defined by Keeler-Wolf.

Vernal pools typical of the region are alkaline and may display whitish saline deposits in non-vegetated centers of dry pools. These pools comprise up to several acres and may occur singly or in small aggregations. The pools are often in combinations of small playa-like pools and hogwallow depressions. The few hardpan pools in the region occupy hogwallow topography in areas between Interstate 505 and Highway 5 just north of Vacaville. Soil underlying most of the claypan pools in the vicinity of the Base and Jepson Prairie is Pescadero clay loam or Sycamore series.

Agricultural practices, water diversion and impounding for waterfowl enhancement, development, and road-building have impacted vernal pools in the region. The Solano Land Trust and the California Department of Fish and Game (DFG) manage adjacent reserves to protect portions of the Northern claypan type (totaling approximately 2,300 acres). In addition, the Wilcox Ranch, adjacent to the Base on the east, is a preservation area under restricted land use. Many of the pool areas in the region have been converted to agriculture or developed as residential, commercial, or industrial developments. Restoration of some of the less-intensely altered agricultural lands (including old rice fields) are targets for land acquisitions through direct purchases, conservation easements, or other cooperative agreements.

The Solano County Farmland and Open Space Foundation's Jepson Prairie Preserve contains examples of the claypan pools in the region, including populations of the two species endemic to the region. The Calhoun Cut Ecological Area, managed by California DFG also contains some claypan pools. Chevron Corporation purchased 160 acres of a vernal pool/grassland complex east of the Base and placed the land under a conservation easement as part of mitigation for a project impacting pools near the interchange of Interstate 505 and Highway 80.

3.2 REMNANT VERNAL POOL / GRASSLAND COMPLEX WITHIN THE ACTION AREA

3.2.1 Hydrology

Vernal pool hydrology is determined primarily by direct inputs of precipitation. Timing and amount of rainfall, along with basin topography, are the primary factors that determine the depth and duration of standing water (Zedler 1987). Natural surface water flows in most years are limited to instances when pools are at capacity and overland sheet flow exceeds the water holding capacity of individual pools (Hanes and Stromberg 1998). Subsurface flows have limited importance in maintaining hydroperiods in vernal pools associated with the action area; however, subsurface flows may dampen water level fluctuations during the wet season (Hanes and Stromberg 1998).

There are three major watershed areas in the vicinity of the Base. A western watershed drains the majority of the Base and is completely to the west of the Proposed Action. This watershed has residential areas with stormwater infrastructure (*i.e.,* pipes and inlets) that generates stormwater flows due to high impervious cover. The Proposed Action will not add to this impervious cover. A northeastern watershed is adjacent to the northeast corner of the Base and drains due east. It completely resides outside the Base perimeter and is not affected by the Proposed Action. Only the central watershed is directly affected by the Proposed Action.

The construction of Runway 03R/21L altered the local hydrology of the central watershed. The drainage path that once connected portions west of the LZ to areas east of the Base is now dissected by the area contained by Perimeter Road. Under existing conditions, storm water runoff from the central watershed is channeled from the runway through drainage features that exit the Base at two locations on the northeast corner of the

Base boundary. Denverton Creek is the adjacent creek to the east that receives these discharges.

The Perimeter Road acts as an effective berm and channels water down the slope gradient toward the drainage feature. The central watershed area upslope from the exit point contains three separate hydraulic watersheds (Watersheds A, B, and C) that total a combined 1,133.7 acres. These watersheds are shown on Figure 3.1, along with representative subwatersheds that were used in construction of the hydrological model. A subsurface storm water conduit routes runoff from Watershed A underneath the runway to a channel that reconnects with the Denverton Creek's continuation. Watershed B is completely contained by Perimeter Road and is the area where the Proposed Action takes place. Watershed C was also dissected by the runway and flows around the perimeter to another channel that discharges into Denverton Creek. The water that exits the Base is discharged to Denverton Creek, which diffuses on Wilcox Ranch, as shown in Figure 3.1. Table 3.1 presents information for the three watersheds, each with its associated amount of impervious cover. Table 3.2 shows the current flow volumes and velocities for the three modeled storm events. Appendix B contains detailed information on the modeling techniques used in the hydrological assessment.

Appendix B contains a hydrological assessment prepared for the Proposed Action. The purpose of the hydrological assessment is to understand how rainfall runoff patterns change (*i.e.*, quantity, intensity, and velocity) due to the additional impervious cover resulting from the Proposed Action. The technical analysis includes determination of rainfall, quantification of change in impervious cover, assessment of hydraulics, and analyses of outputs to determine the changes in flow patterns. Three storm events (2-year, 5-year, and 10-year) were used to formulate various scenarios with pre-post construction comparisons to evaluate change. Rainfall amounts that would produce these storm events were derived from the *Precipitation-Frequency Atlas of the Western United States* (NOAA 1973). Swales and creeks are the principal water courses used in the model. Swales are typically adjacent to major roadways and taxiways, while creeks are mostly outside the Base.

Table 3.1 Current Central Watershed Characteristics

Watershed		Area (acres)	Impervious Cover (acres)	Slope[1] (Percent)
Main Unit	Sub-unit			
A	A-1	90.5	16.0	0.67
	A-2	593.0	-	0.30
B	B-1	83.5	-	0.34
	B-2	92.3	29.0	0.16
	B-3	51.7	9.8	0.24
	B-4	10.4	-	0.31
C	C-1	212.0	-	0.31
TOTAL		1133.7	54.8	0.32 [2]

Obtained from 2-foot contours from the Base, and regional 10-foot contours for portions off Base

Area-weighted average

Table 3.2 Current Flow Contributions to Offsite Locations

Storm Event	Downstream Flow Contribution at Denverton Creek		
	Volume (acre-feet)	Peak Discharge (cfs)	Peak Velocity (feet / second)
2-year	9.19	12.24	0.78
5-year	13.36	17.72	0.90
10-year	16.51	21.86	0.95

3.2.2 Vegetation and Historic Landuse

The vegetation community found within the action area is best described as a degraded vernal pool / grassland complex. The area may be considered degraded because of (1) alterations of surface and subsurface hydrology, (2) filling in depressional features (vernal pools) and leveling mima-mound topography, (3) dominance of introduced grasses in upland areas, and (4) current land management activities accomplished under the 2006 Travis AFB Bird/Wildlife Aircraft Strike Hazard (BASH) Plan (Travis AFB 2006).

Past landuse practices and grading activities within the action area included construction of the original airfield which leveled much of the characteristic mima-mound topography. Consequently, many of the vernal pools were either filled in or the surrounding upland area was altered sufficiently to decrease the sheet flow contribution of surface water into remnant pools. Swales are evident within the action area, more so toward the northern portion of the proposed LZ.

The Travis AFB BASH Plan prescribes a vegetation management regime for vegetated areas on the airfield and maintains the vegetation as homogeneously as possible. Airfield Management/Base Operations (60 OSS/OSAA) is responsible for ground maintenance of grass height between a minimum of 7 inches to a maximum of 14 inches to reduce attractiveness to wildlife/birds. The BASH Plan does not contain a mowing schedule; however, the Plan mandates that grass should be cut before seed heads develop to avoid attracting grain-eating birds. Most of the grass genera in the action area are considered winter annuals (*Avena, Bromus, Hordeum, Vulpia*), which typically develop seed heads in the mid to late spring, and are fully mature by the onset of the dry season. Therefore, spring mowings are required in the BASH Plan. Stands of brush and shrubs are also removed.

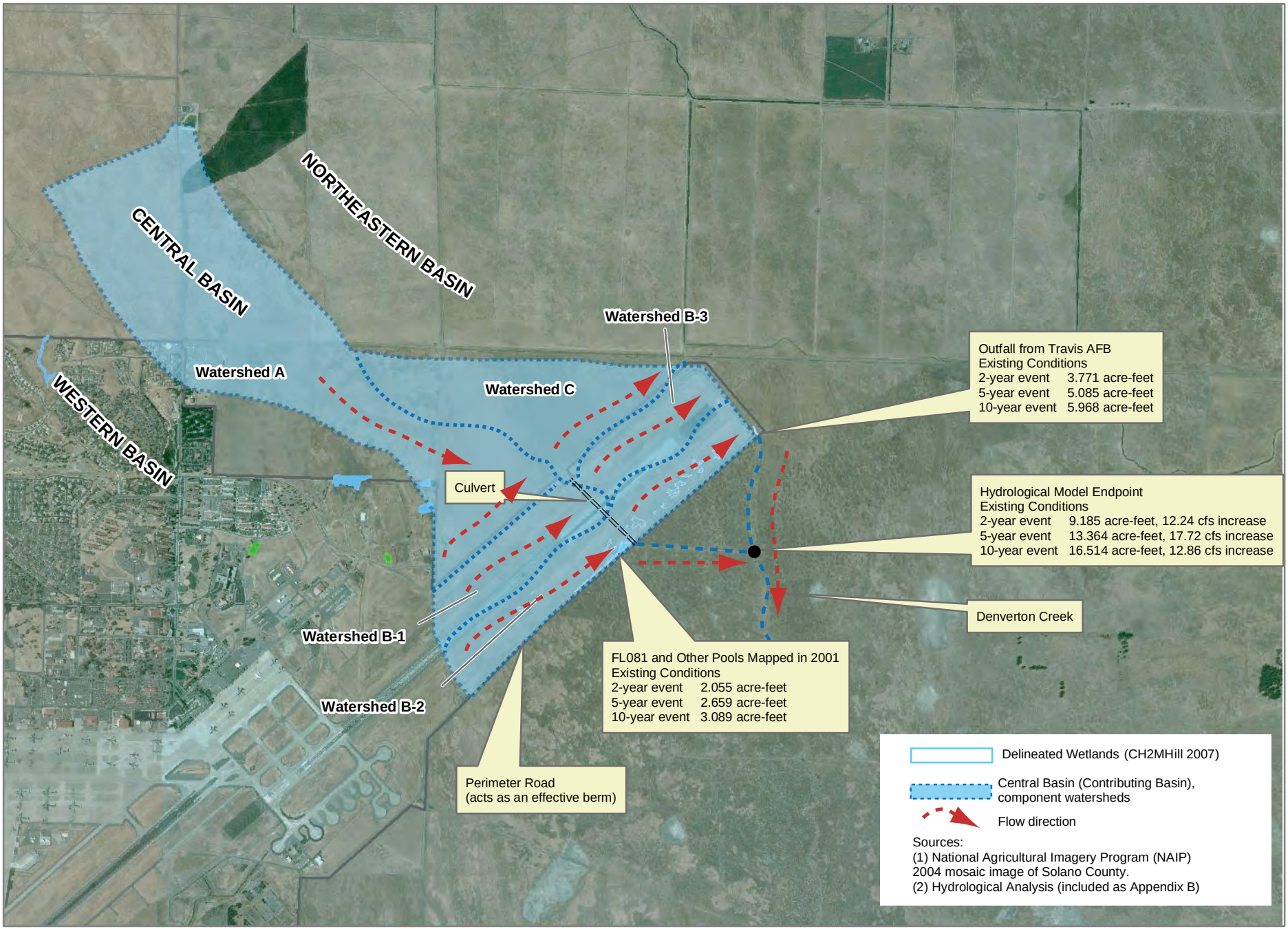


Figure 3.1 Hydrology and Vernal Pools within the Action Area

Biological Assessment
Permanant Southwestern U.S. C-17 Landing Zone,
Travis AFB, Solano County, California

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Parsons (2007) categorized the vernal pool / grassland complex into three vegetation community types. These vegetation community types are dispersed along a xeric-mesic gradient, where no distinct boundary between these areas could be defined without quantitative vegetation sampling. Table 3.3 lists the three vegetation community types, species observed within each community type, and wetlands indicator codes indexed to each species for the California region (USFWS 1988). Although not intended as an intensive vegetation inventory, the list characterizes the vegetation communities found within the action area. A multispectral satellite image of the action area was acquired (Digital Globe/QuickBird acquisition 2007) concurrent with the wet season of 2006-2007. The image assisted field efforts to characterize vegetation communities in the action area. A companion dry season image was also acquired for the area. The vegetation community types identified are described in the following paragraphs.

- **Upland Annual Grassland Community**

  This community type is dominated by introduced annual grasses associated with agricultural practices (grazing), along with occurrences of non-native and native wildflowers and weedy forbs. The annual grasses germinate with the onset of fall rains, and grow throughout the winter to flower throughout the spring. By summer, the annual grasses have set seed and are desiccated. Most areas within the action area are dominated by soft brome (*Bromus hordeaceus*), rat-tail fescue (*Vulpia myuros*), Italian ryegrass (*Lolium multiflorum*), cheatgrass, ripgut brome (*Bromus diandrus*), Hardinggrass (*Phalaris tuberosa*), , wild oat (*Avena fatua*), and slender oat (*Avena sativa*).

- **Non-Native Grass Seasonal Wetland**

  This community type is found in depressional areas in the action area and is characterized by depressions, swales, or drainage features. These depressional areas hold water for short periods of time relative to active vernal pools found on adjacent properties or the western and southwestern portion of the Base. Many of these areas were once more mesic and perhaps functioned as vernal pools under historical / pre-disturbance hydrological conditions. These mesic depressional prairie areas within the action area are dominated by Italian ryegrass, ripgut brome, wild oat, and filaree (*Erodium* spp). Other species associated with this community type include soft brome, and Fremont's goldfields and coyote thistle (*Eryngium vaseyi).* The overall habitat quality and species diversity are generally low in these areas relative to true vernal pool habitats (CH2MHill 2006).

- **Vernal Pool Community**

  This community type is found in remnant vernal pools within the action area and is dominated by native annual plants characteristic of northern claypan soils (Sawyer and Keeler-Wolf 1995). These areas typically occur in areas where the basin topography is pronounced and surface water is present for a relatively short duration. Goldfields (*Lasthenia* spp.) were observed in apparent ephemeral depressions, later identified by Collinge (2007) as the common Fremont's goldfield (*L. fremontii*). Other species included ripgut brome, wild oat, Italian

ryegrass, filaree, annual hairgrass (*Deschampsia danthonioides*), and rare occurrences of dowingia flower (*Downingia cuspidata*). Vernal pool FL081 (described Subsection 3.2.3) is an obvious example of this community type.

Portions of the action area off-Base on the Wilcox Ranch are under deed restrictions that prohibit most kinds of development. This area exhibits mima-mound topography, a relatively higher composition of native plant species and diversity, and is actively grazed by cattle (CH2MHill 2001; TNC 2002). Cattle grazing has been shown to help maintain native and aquatic diversity in vernal pool habitats (Marty 2005). Muzzy Ranch, bordering Wilcox Ranch, also exhibits relatively higher species diversity, and parcels of Muzzy Ranch have been proposed to the U.S. Army Corps of Engineers as a mitigation bank (LSA Associates, Inc. 2004).

Table 3.3 Vegetation Community Types and Species Observed within the Action Area

Vegetation Community Type	Common Name	Scientific Name	Origin[1]	Wetlands Indicator Code[2]
Upland Annual Grassland	Soft brome	*Bromus hordeaceus*	Introduced (Europe)	FACU-
	Rat-tail fescue	*Vulpia myuros*	Introduced (Europe)	FACU
	Italian ryegrass	*Lolium multiflorum*	Introduced (Europe)	FAC
	Ripgut brome	*Bromus diandrus*	Introduced (Europe)	FACU
	Hardinggrass	*Phalaris tuberosa*	Introduced (Mediterranean Basin)	FAC+
	Wild oat	*Avena fatua*	Introduced (Africa, Europe, Asia)	UPL
	Slender oat	*Avena sativa*	Introduced (Africa, Europe, Asia)	UPL
Non-Native Grass Seasonal Wetland Community Type	Italian ryegrass	*Lolium multiflorum*	Introduced (Europe)	FAC
	Coyote thistle	*Eryngium vaseyi*	California Native	FACW
	Ripgut brome	*Bromus diandrus*	Introduced (Europe)	FACU
	Wild oat	*Avena fatua*	Introduced (Africa, Europe, Asia)	UPL
	Filaree	*Erodium spp.*	Introduced (Europe)	FACW
Vernal Pool Community Type	Fremont's goldfield	*Lasthenia fremontii*	California Native	OBL
	Wild oat	*Avena fatua*	Introduced (Africa, Europe, Asia)	UPL
	Downingia flower	*Downingia cuspidata*	California Native	OBL
	Italian ryegrass	*Avena fatua*	Introduced (Europe)	FACU
	Filaree	*Erodium spp.*	Introduced (Europe)	FACW
	Coyote thistle	*Eryngium vaseyi*	California Native	FACW
	Annual hairgrass	*Deschampsia danthonioides*	California Native	FACW

NOTES:

[1] *Plant species origins from Crampton (1974), Munz (2004), USDA PLANTS Online Database (last accessed May 2007), and Calflora Database (last accessed May 2007).*

California regional wetland indicator code key (USFWS 1988):

OBL Obligate wetland plant, occurring almost always (99% probability) under natural conditions in wetlands.

FACW Facultative wetland plant, usually occurs in wetlands (67% - 99% probability), but occasionally found in upland areas (1% - 33% probability).

FAC Facultative plant, equally likely to occur in wetlands or uplands (34% - 66% probability).

FACU Facultative upland plant, usually occurs in uplands (67% - 99%), but occasionally found in wetlands (1% - 33% probability).

UPL Obligate upland plant, occurs almost always (99% probability) under natural conditions in upland areas.

3.2.3 Vernal Pools and Other Wetland Types

Construction of the Perimeter Road effectively created a long linear berm that apparently facilitates water collection and extends the hydroperiod of depressions adjacent to the road (Parsons 2007). One vernal pool, designated as "FL081" by Jennings (2005), is formed primarily by the road, and covers an area of 0.8-acre. Although FL081 is outside the project footprint and is not subject to removal, it is the feature most characteristic of vernal pools still present on Base in the immediate vicinity of the proposed LZ. Neither fairy shrimp nor tadpole shrimp have been observed in this feature when it holds water (CH2MHill 2006; EcoAnalysts 2005). A recent field visit by Parsons (2007) noted the prolific occurrence of goldfields within FL081, as well as sparse occurrences in swales and remnant ephemeral features within the action area. Collinge (2007) subsequently visited the site and determined that the goldfields within FL081 and throughout the action area are the common Fremont goldfield (*L. fremontii*), not the endangered Contra Costa variety (*L. conjugens*), which supported the 2006 Base-wide summary of occurrences of special status species (CH2MHill 2006).

Although FL081 exhibits obvious characteristics of vernal pool hydrology and vegetation and is conspicuous because of its location inside Perimeter Road, other vernal pools were mapped in 2007 within the action area during a wetlands and waters of the U.S. pre-jurisdictional determination study (CH2MHill 2007). The wetland delineation was performed within an area comprised of the proposed LZ runway, the batch plant, and was extended to include an additional 300 feet on the northeast and southwest borders. The study identified 1.88 acres of seasonal wetlands and 0.80 acres of vernal pools. The drainage ditch that conveys surface flows into Denverton Creek was also delineated as a wetlands area and amounts to 0.77 acres. Cumulatively, 3.45 acres of wetlands are located within the action area. The wetlands within the action area have a significant nexus to Suisun and Grizzly Bays (navigable waters) via Denverton Creek and Nurse Slough, therefore, the wetlands are potentially jurisdictional under Section 404 of the Clean Water Act (CH2MHill 2007). These vernal pools and other wetland features were assessed as insufficient to support conditions for California tiger salamander breeding habitat (Jennings 2005), and T&E invertebrates do not occupy these pools (CH2MHill 2006; EcoAnalysts 2005; CH2MHill 2001; Biosystems Analysis, Inc. 1994).

Vernal pools on the relatively undisturbed property adjacent to the Base (Wilcox Ranch) may occur as small ponds in mima-mound topography, or as somewhat larger playas. The Muzzy Ranch, a proposed mitigation bank (LSA Associates, Inc. 2004), also contains similar drainage and wetland features. Denverton Creek drains areas to the north of the Wilcox Ranch, as well as receiving contributing flows routed from the Base. Seasonal flows into Denverton Creek may cause backing up of water, thereby increasing hydrological connectivity to upstream vernal pools.

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SECTION 4
STATUS OF SPECIES IN THE ACTION AREA

4.1 TECHNICAL SUPPORT STUDIES RELEVANT TO THE PROPOSED ACTION

Technical support studies, literature review, California Natural Diversity Data Base (CNDDB) queries, and distribution data available from USFWS recovery plans relevant to the action area were used to identify potential species and species habitat that may be present within the action area. The technical support studies are listed in Table 4.1.

4.2 SPECIES CONSIDERED FOR ANALYSIS

A species list was obtained from the USFWS Sacramento Ecological Services Field Office via an online query system indexed to U.S. Geological Survey (USGS) quadrangles. This list functions as the "official" species list issued by the ecological services office pursuant to 50 CFR 402.12(e). Four USGS Quadrangle names (Elmira, Denverton, Birds Landing, and Dozier) that covered the action area, as well as the Base and surrounding areas, were submitted. Table 4.2 lists T&E species that correspond to these USGS quadrangle maps and the results of CNDDB queries for species occurrences.

Six of the 21 T&E species listed in Table 4.2 have potential to be affected by the Proposed Action. Inclusion of these species was not dependent on the confirmed presence of species or habitat within the action area. These six species include the following, and are further described in Subsection 4.3:

- California tiger salamander (Threatened)
- Contra Costa goldfield (Endangered)
- Conservancy fairy shrimp (Endangered)
- Vernal pool fairy shrimp (Threatened)
- Vernal pool tadpole shrimp (Threatened)
- Delta green ground beetle (Threatened)

Figure 4.1 shows known distributions of California tiger salamanders within the vicinity of the action area. Known distributions of Contra Costa goldfields are shown on Figure 4.2, and T&E invertebrates are shown on Figure 4.3.

Table 4.1 Technical Support Studies within the Action Area

Study name	Date of Study	Study Area	Species of interest	Summary of findings
Pre-jurisdictional Wetlands and Waters of the U.S. Report (CH2MHill 2007)	October 2007	LZ Action Area	-	3.45 acres of wetlands and waters of the U.S. were identified within the LZ Action Area.
Site Assessment Report for California tiger salamander: Proposed Assault Landing Zone, Travis AFB (Parsons 2007)	April 2007	LZ Action Area	California tiger salamander	Area subject to direct impacts does not contain vernal pools suitable for breeding. Entire area suitable as upland habitat.
Technical memo*: Lasthenia conjugens* potential presence within LZ action area (Collinge 2007)	May 2007	LZ Action Area	Contra Costa goldfield	Pedestrian surveys in the action area found *Lasthenia* species were *L. fremontii*, not endangered *L. conjugens*, although suitable habitat present.
Summary of Rare, Threatened and Endangered Species Associated with Seasonal Wetlands (CH2MHill 2006)	2006	Travis AFB (Base-wide)	Summary of all special status species	Current distributions of special status species
Results of Special-Status Vernal Pool Invertebrate Surveys at Travis Air Force Base (EcoAnalysts 2006)	Wet season, 2005 – 2006	Travis AFB (Base-wide)	Delta green ground beetle Ricksecker's hydrochara Vernal pool fairy shrimp Vernal pool tadpole shrimp Conservancy fairy shrimp	Only vernal pool fairy shrimp and vernal pool tadpole shrimp were found on the Base. LZ action area not identified as habitat. FL081 contained stickleback, a known predator of salamander larvae.
Results of First-Year Special-Status Vernal Pool Invertebrate Surveys at Travis Air Force Base – Winter/Spring 2004/2005 (EcoAnalysts 2005)	Wet season, 2004 – 2005	Travis AFB (Base-wide)		
California Tiger Salamander Habitat Assessment at Travis AFB, Solano County, California (CH2MHill 2005)	April – May 2005	Travis AFB (Base-wide)	California tiger salamander	Vernal pool FL081 identified as medium potential for breeding habitat. Water was present in this pool (2 feet deep).
Mitigation Bank Proposal, Muzzy Ranch Mitigation Bank (LSA Associates, Inc. 2004	2004	Muzzy Ranch	Special status species	Numerous locations of vernal pool tadpole shrimp, vernal pool fairy shrimp, and some occurrences of Conservancy fairy shrimp, as well as CTS.
Survey of Critical Habitat, Threatened and Endangered Plant Species, and Wetlands in Area 3 and Railroad ROW (CH2MHill 2001)	April – May 2001	LZ Action Area and Railroad ROW	Special status plants	Mapped vernal pool extents in the action area.
Vernal Pool Resources at Travis AFB (Biosystems Analysis, Inc. 1994)	1994	Travis AFB (Base-wide)	Special status species	Wetlands inventory and rare plant survey
Assessment of Special Status Plant and Animal Species at Travis AFB, Solano County, California, Phase II Survey (Biosystems Analysis, Inc. 1993)	1993	Travis AFB (Base-wide)	Special status species	Wetlands inventory and rare plant survey.

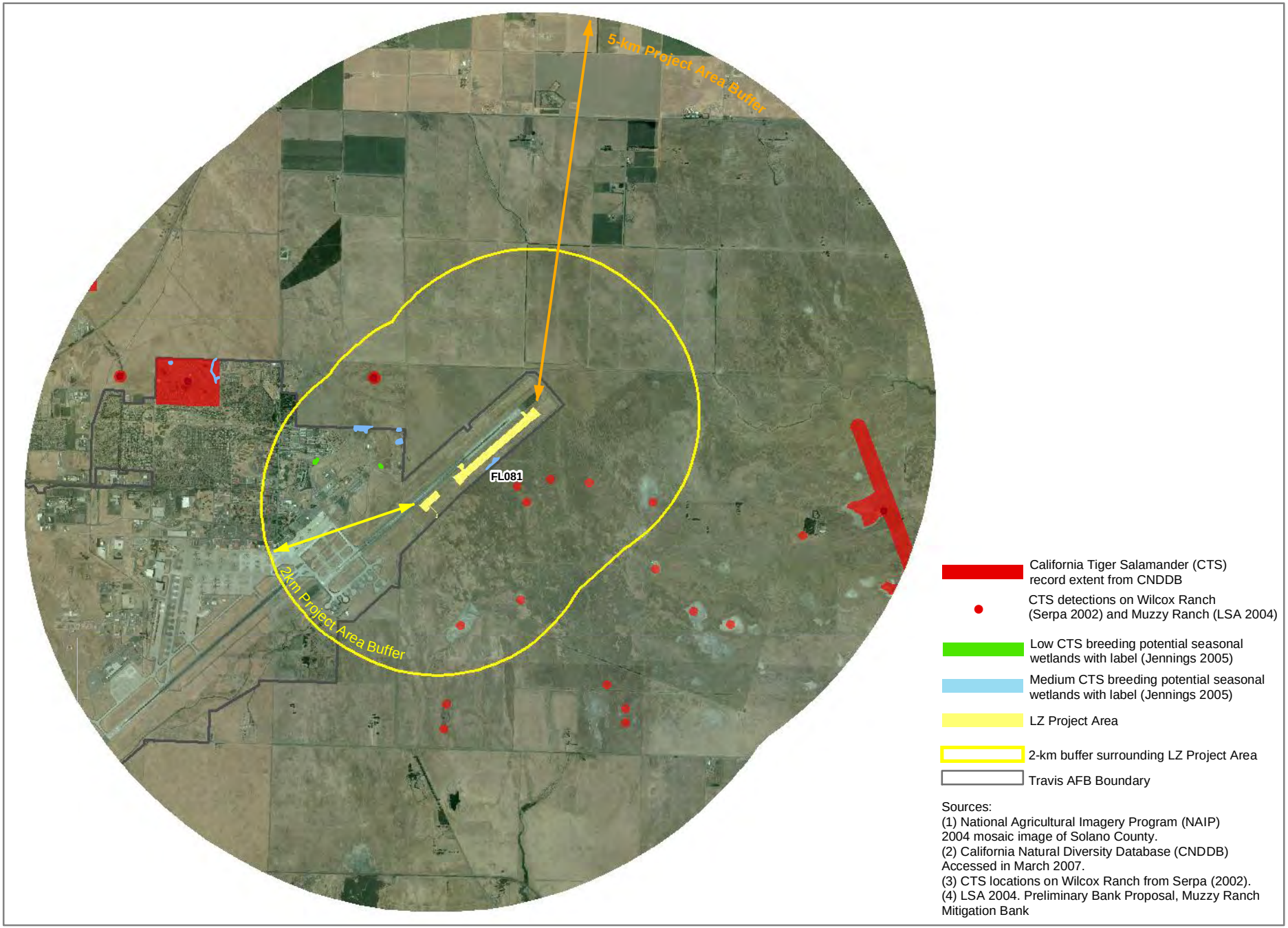


Figure 4.1
Distribution of California Tiger Salamander

Biological Assessment
Permanant Southwestern U.S. C-17 Landing Zone,
Travis AFB, Solano County, California

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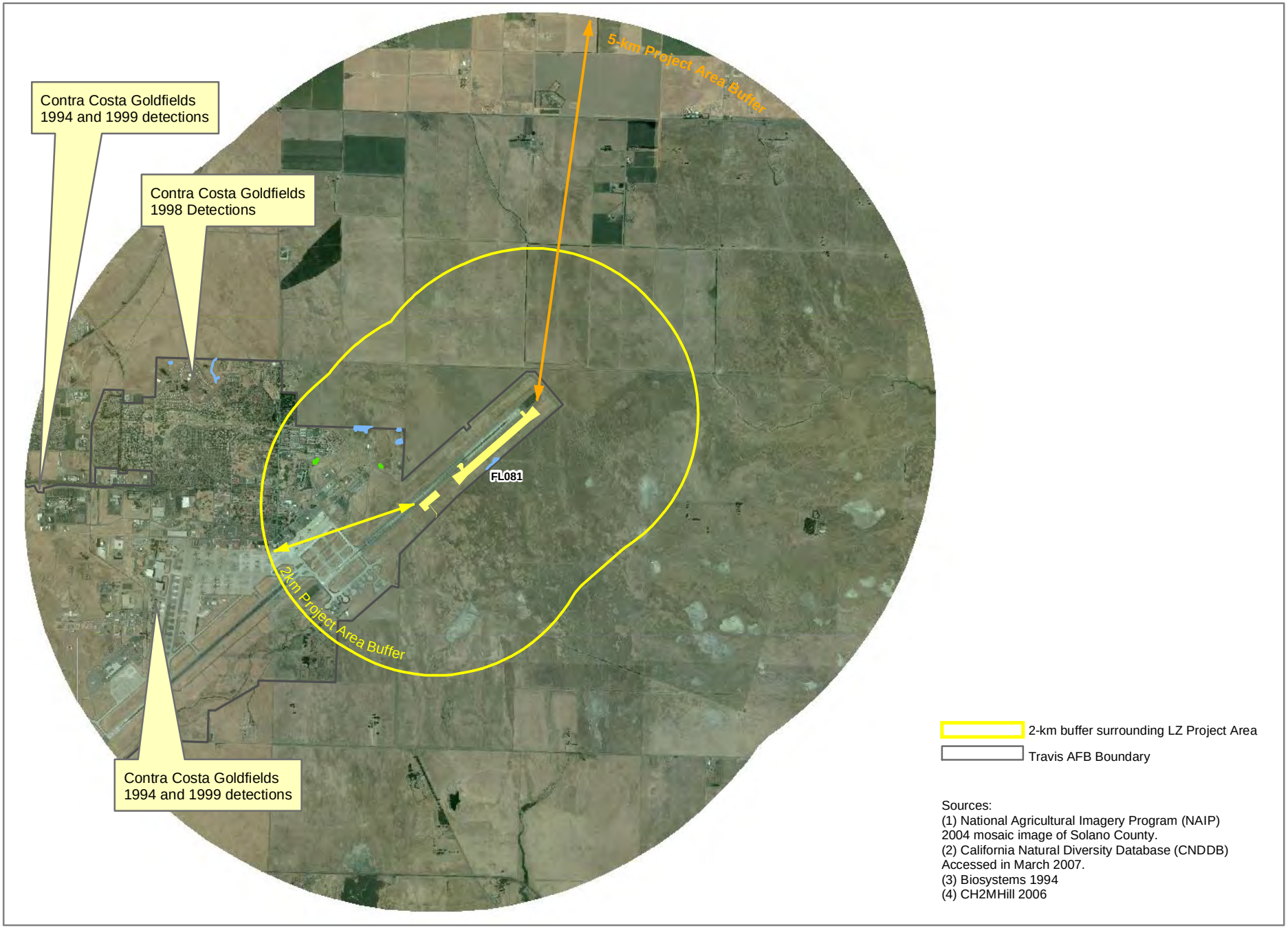


Figure 4.2
Distribution of Contra Costa Goldfields

Biological Assessment
Permanant Southwestern U.S. C-17 Landing Zone,
Travis AFB, Solano County, California

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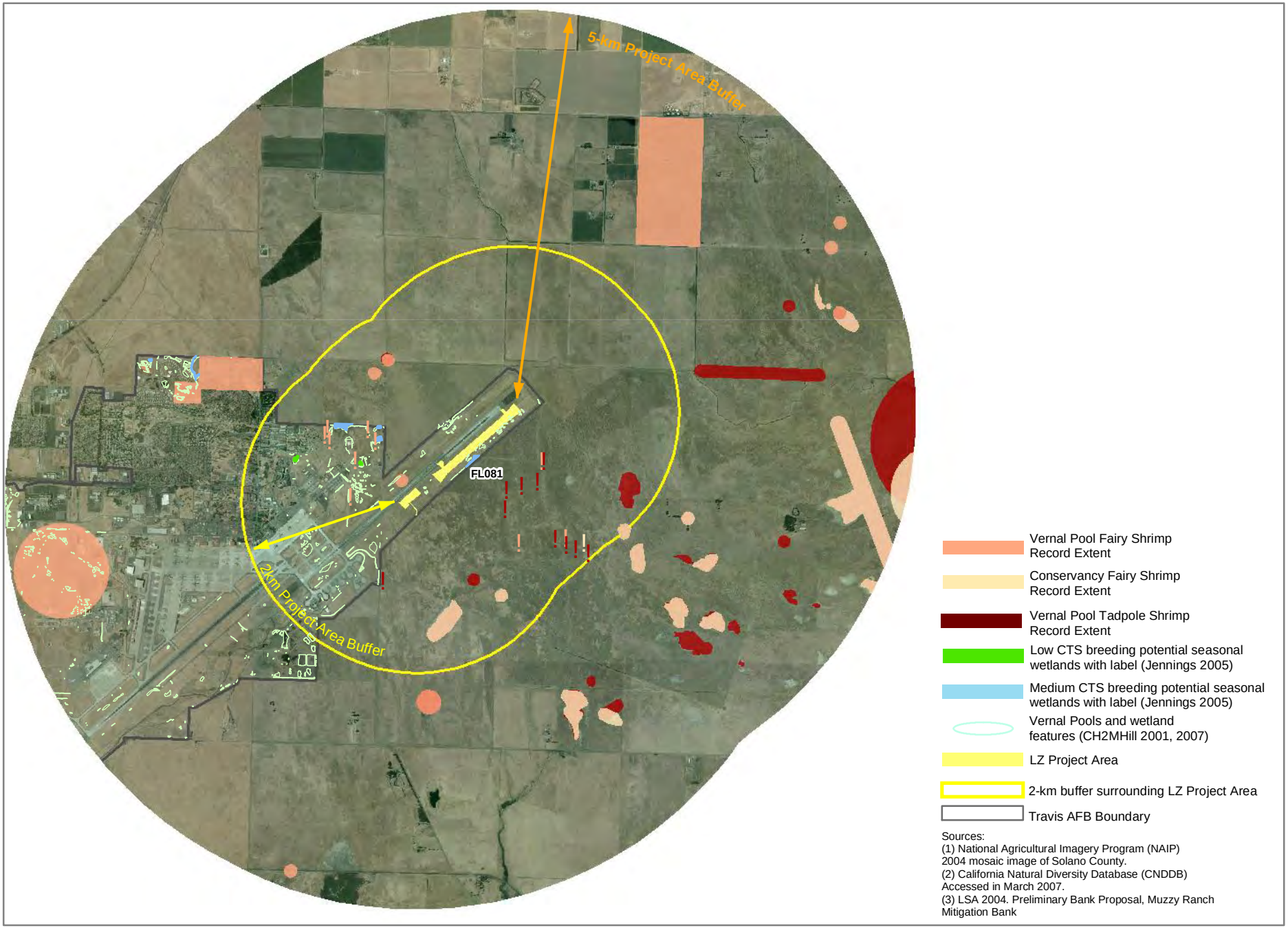


Figure 4.3
Distribution of T&E Invertebrate Species

Biological Assessment
Permanant Southwestern U.S. C-17 Landing Zone,
Travis AFB, Solano County, California

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Table 4.2 Species List Obtained from USFWS Sacramento Ecological Services Field Office, Current Distribution, and Status within the Action Area

Taxonomic Group	Common Name	Scientific Name	Listing Status	Current Distribution (Based on CNDDB Query Results, April 2007 and Recent Surveys)			Habitat Present or Known Occurrence within Action Area	Critical Habitat on or Adjacent to Action Area
				California Occurrences	Solano County Occurrences	Travis AFB Occurrences		
Plants	Suisun thistle	*Cirsium hydrophilum* var. *hydrophilum*	Proposed Threatened	3	3	0	No	No
	Soft bird's-beak	*Cordylanthus mollis mollis*	Endangered	27	15	0	No	No
	Contra Costa goldfields	*Lasthenia conjugens*	Endangered	31 (24 extant)	12	Concentrations on West side of base	Habitat present, Species unlikely present	Yes
	Colusa grass	*Neostapfia colusana*	Threatened	60	2	0	No	No
	San Joaquin Valley Orcutt grass	*Orcuttia inaequalis*	Threatened	52	1	0	No	No
	Solano grass	*Tuctoria mucronata*	Threatened	3	2	0	No	No
Invertebrates	Conservancy fairy shrimp	*Branchinecta conservatio*	Endangered	28	13	0	Habitat present. Species occurs on adjacent Wilcox Ranch. Species not found in vernal pools on the Base (CH2Mhill 2006).	Yes
	Vernal pool fairy shrimp	*Branchinecta lynchi*	Threatened	400	23	3	Habitat present. Species occurs on the Base and adjacent Wilcox Ranch. Species not found in vernal pools in the action area (CH2MHill 2006)	Yes
	Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	Threatened	194	9	0	No	No

Taxonomic Group	Common Name	Scientific Name	Listing Status	Current Distribution (Based on CNDDB Query Results, April 2007 and Recent Surveys)			Habitat Present or Known Occurrence within Action Area	Critical Habitat on or Adjacent to Action Area
				California Occurrences	Solano County Occurrences	Travis AFB Occurrences		
	Delta green ground beetle	*Elaphrus viridis*	Threatened	7	7	0	Habitat present. Species does not occur on the Base, but is found on adjacent Wilcox Ranch. Species not found in vernal pools in the action area (CH2MHill 2006)	No
	Vernal pool tadpole shrimp	*Lepidurus packardi*	Endangered	226	31	0	Habitat present. Species may occur on the Base and does occur on adjacent Wilcox Ranch. Species not found in vernal pools in the action area (CH2MHill 2006)	Yes
Fishes	Green sturgeon	*Acipener medirostris*	Threatened	0	0	0	No	No
	Delta smelt	*Hypomesus transpacificus*	Threatened	7	5	0	No	No
	Central Valley Chinook salmon	*Oncorhynchus tshawytscha*	Threatened[1] / Endangered[2]	0	0	0	No	No
	Central Valley steelhead	*Oncorhynchus mykiss*	Threatened	0	0	0	No	No
Amphibians	California tiger salamander	*Ambystoma californiense*	Threatened	827	14	1	Upland habitat present, breeding habitat unlikely.	Yes
	California red-legged frog	*Rana aurora draytonii*	Threatened	923	12	0	No	No
Reptiles	Giant garter snake	*Thamnophis gigas*	Threatened	221	3	0	No	No

Taxonomic Group	Common Name	Scientific Name	Listing Status	Current Distribution (Based on CNDDB Query Results, April 2007 and Recent Surveys)			Habitat Present or Known Occurrence within Action Area	Critical Habitat on or Adjacent to Action Area
				California Occurrences	Solano County Occurrences	Travis AFB Occurrences		
Birds	California clapper rail	*Rallus longirostris obsoletus*	Endangered	90	22	0	No	No
Mammals	Silver marsh harvest mouse	*Reithrodontomys raviventris*	Endangered	127	49	0	No	No

1 Spring-run salmon, designated as Threatened

2 Winter-run salmon in the Sacramento River, designated as Endangered

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4.2.1 California Tiger Salamander - *Ambystoma californiense*

Species Description and Listing Status

The California tiger salamander was listed on August 4, 2004 as Threatened throughout its range (69 CFR 47211-47248). The USFWS decision to downlist the Sonoma and Santa Barbara populations from Endangered to Threatened was reversed in U.S. District Court on August 19, 2005. Therefore, the Sonoma and Santa Barbara populations are listed as Endangered. On August 23, 2005, critical habitat was designated in 19 counties for the central population, amounting for 199,109 acres (70 CFR 49379).

The California tiger salamander is an amphibian in the family Ambystomatidae, endemic to California and native to Solano County. It is a large terrestrial salamander with a broad, rounded snout. Coloration consists of white or pale yellow spots or bars on a black background on the back and sides. The belly varies from almost uniform white or pale yellow to a variegated pattern of white or pale yellow and black. The salamander's small eyes protrude from their heads, and the eyes have black irises (Jennings and Hayes 1994). Males can be distinguished from females, especially during the breeding season, by their swollen cloacae, a common chamber into which the intestinal, urinary, and reproductive canals discharge. They also have more developed tail fins and larger overall size. Adult males are slightly larger than females (8 inches and less than 7 inches, respectively) (Stebbins 1951). Juvenile salamanders are 1.7 to 2.8 inches form the tip of the snout to the rear of the vent, and have the same coloration patterns as adults (as cited in Jennings 2005). Larval salamanders range in size from 0.4-6.6 inches in total length with a pale-yellow, tan, or dark colored belly (Andersen 1968). After 2 weeks from emergence, a larval salamander will have prominent external gills and legs (Storer 1925). Egg sizes are reported by Storer (1925) to measure 0.13-0.21 inches.

Life History and Ecology

Breeding of adult California tiger salamanders has been observed following the onset of warm rains (November through late December) (Storer 1925; Barry and Schaffer 1994). Based on observations in the 1990s, unseasonably cold rains or drought periods in the wet season may inhibit breeding activity (as cited in Jennings 2005). Males and females nocturnally migrate up to 1 mile or more from subterranean refugia to egg deposition sites, which include vernal pools with substantial hydroperiods (Austin and Schaffer 1992; Loredo, *et al.* 1996; Twitty 1941; Andersen 1968).

Males generally precede females during the breeding season by 1 or 2 weeks (Loredo, *et al*. 1996). Females normally deposit eggs on vegetation or detritus in shallow margins of pools (Storer 1925), which may number up to 350 eggs per season, although Jennings (2005) reports that 100-200 eggs are more typical. Soon after spawning, adult salamanders will return to aestivation habitats (small mammal burrows), where they spend approximately 9-10 months until the next winter rains (Barry and Schaffer 1994; Loredo, *et. al* 1996; Jennings 2005). Associated upland habitat containing underground refugia is essential for the survival of adult California tiger salamanders and juveniles that have recently undergone metamorphosis. For the majority of their life cycle,

California tiger salamanders depend for survival on upland habitats in these underground (or covered and concealed) refugia where they are less susceptible to desiccation. The ability of California tiger salamanders to move freely across the landscape in search of breeding ponds is essential in maintaining gene flow and recolonization of sites that are temporally extirpated and is essential in preserving the California tiger salamander's population structure.

Salamander embryos hatch approximately 2 to 4 weeks after egg deposition, and the aquatic larvae require a 10-12 week metamorphosis period before developing into the juvenile form. Following metamorphosis (normally early May through July), juveniles emigrate from drying breeding ponds in mass group migrations (Holland, *et al.* 1990).

Larvae require significantly more time to transform into juvenile adults than other amphibians such as the western spadefoot toad (*Scaphiopus hammondii*), and the Pacific tree frog (*Pseudacris regilla*). Sexual maturity is reached typically after 2 years, although longer periods may be required when juvenile salamanders experience stress through drought or seasonal rainfall (Schaffer, *et al.* 1993).

Distribution and Threats

The species is restricted to grasslands and low (under 1,500 feet above mean sea level) foothill regions where lowland aquatic sites are available for breeding. They prefer natural ephemeral pools, ponds that mimic them (stock ponds that are allowed to go dry), or ponds that are specifically managed under a moist soil management regime (wet season flooding and dry season draw downs).

This species is restricted to California and does not overlap with any other species of tiger salamander. California tiger salamanders are restricted to vernal pools and seasonal ponds, including many constructed stockponds, in grassland and oak savannah plant communities from sea level to about 1,500 feet above mean sea level in central California. In the Coastal region, populations are scattered from Sonoma County in the northern San Francisco Bay Area to Santa Barbara County, and in the Central Valley and Sierra Nevada foothills from Yolo to Kern Counties. The Sonoma population appears to have been geographically isolated from the remainder of the California tiger salamander population by distance, mountains, and major waterway barriers for more than 700,000 years.

The primary cause of the decline of California tiger salamander populations is the loss and fragmentation of habitat from human activities and the encroachment of non-native predators. Federal, state, and local laws have not prevented past and ongoing losses of habitat. All of the estimated seven genetic populations of this species have been significantly reduced because of urban and agricultural development, land conversion, and other human-caused factors.

Reduction of ground squirrel populations to low levels through widespread rodent control programs may reduce availability of burrows and adversely affect the California tiger salamander. Poison typically used on ground squirrels is likely to have a disproportionately adverse effect on California tiger salamanders, which are smaller than the target species and have permeable skins. Use of pesticides, such as methoprene, in

mosquito abatement may have an indirect adverse effect on the California tiger salamander by reducing the availability of prey. Various non-native subspecies of the tiger salamander within family Ambystomatidae have been imported into California for use as fish bait. The introduced salamanders may out-compete the California tiger salamanders, or interbreed with them to create hybrids that may be less adapted to the California climate or are not reproductively viable past the first or second generations. Automobiles and off-road vehicles kill a significant number of migrating California tiger salamanders, and contaminated runoff from roads, highways, and agriculture may adversely affect them.

Status within the Action Area

Although no breeding ponds would be subject to removal (CH2MHill 2006), FL081 has the potential to meet requirements for breeding habitat (Jennnings 2005) with a sufficient hydroperiod. No California tiger salamanders have been observed in FL081. Stickleback (*Gasterosteus aculeatus)*, which may prey on salamander larvae, were observed in the pool by Rogers (2005, 2006). Known breeding ponds within the Wilcox Ranch and Muzzy Ranch are within migration ranges of the action area (TNC 2002, CH2MHill 2006, CNDDB 2007, LSA Associates, Inc. 2004). The accepted range for an area to be considered upland habitat is 1.3 miles from a breeding pond. Based on life cycle descriptions of this species, the California tiger salamander has potential to migrate from known breeding ponds on Wilcox Ranch. Although Perimeter Road may discourage migration from Wilcox Ranch, the road would not exclude the possibility of migration. The annual grassland vegetation within the action area meets the requirements of upland habitat for this species; therefore, this species has the potential to be present within the action area, and may be affected by the Proposed Action. Known sightings of California tiger salamanders on Base and adjacent properties are shown in Figure 4.1.

4.2.2 Contra Costa Goldfields – *Lasthenia conjugens*

Species Description and Listing Status

The Contra Costa goldfield was listed on June 18, 1997 as endangered (62 CFR 34029-34038). Critical habitat was designated in 2005 for this species (70 CFR 46924-46999). The USFWS published a recovery plan that included this species entitled *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS 2005).

Distribution and Threats

The CNDDB reports 31 occurrences of the Contra Costa goldfield (CNDDB, accessed April 2007). Only 24 of the 31 occurrences reported in the CNDDB are thought to be extant. Twelve occurrences of Contra Costa goldfield are found in Solano County. The Solano County occurrence descriptions are included in Appendix A. One of these occurrences is a number of Contra Costa goldfields on the western portions of the Base along and south of the landing strip (former Aero Club), south of Air Base Parkway, and west of the Base hospital, a distance of 3.3 miles from the action area.

Rare plant surveys conducted by Biosystems (1994) counted 36 separate occurrences concentrated on the western portions of the Base. The majority of plants (33 of 36

plants) were located at the former Aero Club or in the grazing areas. The remaining occurrences are found in the southwestern corner of the Base along Perimeter Road at the end of the runway (CH2MHill 2006), approximately 2 ½ miles from the action area.

The Contra Costa goldfield occurred historically in seven vernal pool regions - Central Coast, Lake-Napa, Livermore, Mendocino, Santa Barbara, Santa Rosa, and Solano-Colusa (USFWS 2005).

Threats to this species correspond to general threats to vernal pool ecosystems. These threats include habitat loss and fragmentation, altered hydrology, contaminants, decline of pollinators, improper livestock grazing, environmental change, disease, inappropriate natural resource management activities, and inadequate regulatory mechanisms (USFWS 2005). More specific threats to Contra Costa goldfields include grassland conversion to vineyards and competition from invasive species.

Life History and Ecology

As an annual plant with a strong association to vernal pools, seed germination of Contra Costa goldfields tends to be in response to initial wet season rains in October or November (Collinge 2003; USFWS 2005). In addition to vernal pools, this species is also associated with swales, moist flats, and grassland areas (CNDDB 2007). The flowering period generally lasts from March to June (Skinner and Pavlik 1994; USFWS 2005). Pollination is attributed to insects belonging to five different orders: Coleoptera, Diptera, Hemiptera, Hymenoptera, and Lepidoptera (Thorp and Leong 1998). Most of these pollinators are generalists (pollinating a wide variety of flowering species); however, Thorp and Leong (1998) noted solitary bees (family Andrenidae) as pollinators of Contra Costa goldfield. Because of the lack of a seed pappus or seed hairs on the achenes, wind dispersal of seeds is unlikely. The maximum viability of seed in the ground is unknown; however, because population fluctuations by several orders of magnitude at a particular site have been observed over different seasons, the seeds may be somewhat resilient and form a component of a site's seed bank (USFWS 2005).

Associative plants include Italian ryegrass, popcorn flower (*Plagiobothrys spp*.), smooth goldfields (*L. glaberrima*), and California semaphore grass (*Pleuropogon californicus*) (Collinge 2003; CNDDB 2007; USFWS 2005).

Status within the Action Area

Contra Costa goldfields are not present within the action area (CH2MHill 2006, Collinge 2007). Other members of genus *Lasthenia* are present in the action area (Parsons 2007), which Collinge (2007) identified as the common Fremont's goldfield (*L. fremontii*), not the Contra Costa variety (*L. conjugens*). Associative plant species for Contra Costa goldfields were identified during site visits in April 2007 (Parsons 2007), which included Italian ryegrass and popcorn flower. Known sightings of Contra Costa goldfields on Base and adjacent properties are shown in Figure 4.2.

4.2.3 Conservancy Fairy Shrimp – *Branchinecta conservatio*

Species Description and Listing Status

The Conservancy fairy shrimp (*Branchinecta conservatio*) was listed on September 19, 1994 (59 CFR 48136) as Endangered. Critical habitat was designated on August 6, 2003 (68 CFR 46683) and subsequently revised with critical habitat unit designations on February 10, 2006 (71 CFR 7117). The USFWS published a recovery plan that included this species entitled *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS 2005).

The Conservancy fairy shrimp is a small crustacean in the Branchinectidae family. Fairy shrimp are aquatic species in the order Anostraca. They have delicate elongate bodies, large stalked compound eyes, no carapaces, and eleven pairs of swimming legs. Males range from 0.6 – 1.1 inches long, with females measuring slightly smaller between 0.6 and 0.9 inches (USFWS 2005). They glide gracefully upside down, swimming by beating their legs in a complex, wavelike movement that passes from front to back. Fairy shrimp feed on algae, bacteria, protozoa, rotifers, and bits of detritus.

Distribution and Threats

The CNDDB reports 28 occurrences of the Conservancy fairy shrimp (CNDDB, accessed April 2007). Thirteen occurrences of this species are found in Solano County. The Solano County occurrence descriptions are included in Appendix A. Of these occurrences, none are reported at the Base.

In the Solano-Colusa Vernal Pool Region, Conservancy fairy shrimp are reported on the greater Jepson Prairie, which includes the Wilcox Ranch. The historical distribution of this species is not known (USFWS 2005); however, the distribution of vernal pool habitats in the areas where this species is known to occur were once more continuous and larger in area than they are today (Holland 1998). It is likely the Conservancy fairy shrimp once occupied vernal pool habitats throughout a large portion of the Central Valley and southern coastal regions of California (USFWS 2005).

In the Solano-Colusa Vernal Pool Region, populations of this species are threatened by development on private land, particularly near Fairfield and Vacaville, as well as invasive predator fish introductions. This species is also subject to general threats of vernal pool impacts discussed in Subsection 3.1.

Life History and Ecology

Conservancy fairy shrimp are uniquely adapted to ephemeral conditions characterized by vernal pool habitats. Helm (1998) determined that this species reaches sexual maturity in average of 46 days, and live as long as 154 days, although growth rates are dependent on water temperature, which can vary greatly. Conservancy fairy shrimp produce one large cohort of offspring each wet season (Eriksen and Belk 1999). Conservancy fairy shrimp co-occur with other several other vernal pool crustacean species, including the vernal pool fairy shrimp and the vernal pool tadpole shrimp (USFWS 2005). They glide through the water upside down, swimming by beating their legs in a complex, wavelike movement that passes from front to back. Conservancy fairy

shrimp are filter feeders and leg movements also play a role in straining small particles from the water.

Status within the Action Area

Vernal pools within the action area may support suitable habitat for the Conservancy fairy shrimp. Surveys for special status invertebrates have never detected this species within the action area on Base (CH2MHill 2006, included as Appendix D in this BA). Detections have occurred down the slope gradient off Base on the Muzzy Ranch (LSA Associates, Inc. 2004). Known sightings of Conservancy fairy shrimp are shown in Figure 4.3.

4.2.4 Vernal Pool Fairy Shrimp – *Branchinecta lynchi*

Description and Listing Status

The vernal pool fairy shrimp (*Branchinecta lynchi)* was listed on September 19, 1994 (59 CFR 48136) as Endangered. Critical habitat was designated on August 6, 2003 (68 CFR 46683) and subsequently revised with critical habitat unit designations on February 10, 2006 (71 CFR 7117). The USFWS published a recovery plan that included this species entitled *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS 2005).

The vernal pool fairy shrimp is a small crustacean in the Branchinectidae family. Fairy shrimp are aquatic species in the order Anostraca. They are characterized by the presence and size of several mounds on the male's second antennae, and by the female's short, pyriform brood pouch (USFWS 2005). The species range in size from 0.4 – 1.0 inch (Eng, *et al*. 1990; USFWS 2005). Fairy shrimp feed on algae, bacteria, protozoa, rotifers, and bits of detritus.

Distribution and Threats

The CNDDB reports 400 occurrences of the vernal pool fairy shrimp in northern California (CNDDB, accessed April 2007). Vernal pool fairy shrimp have been identified at 24 locations on the Base and at one location along the railroad right-of-way at Meridian Road.

In 1994, Biosystems identified adult vernal pool fairy shrimp at three locations and fairy shrimp cysts at two locations in the Landfill 2 area and adult fairy shrimp at one location in the fire training area. Adult fairy shrimp and cysts were also found at two locations in the grazing area south of the former Aero Club. The fairy shrimp cysts were keyed only to genus but were assumed to be vernal pool fairy shrimp (Biosystems 1993). During the abbreviated 1994 wet season surveys, Biosystems found adult vernal pool fairy shrimp in a drainage channel along the abandoned railroad track on the north side of Hangar Avenue.

During the 2004-2005 protocol-level surveys conducted by EcoAnalysts, vernal pool fairy shrimp were identified at eight locations on the Base (EcoAnalysts 2005). Most occurrences were on the west side of the Base. Low numbers of adult vernal pool fairy shrimp were observed in five vernal pools west of Union Creek. Two large populations were observed in a roadside pool and a drainage ditch along the abandoned railroad

tracks on the north side of Hangar Avenue, east side of Union Creek. A few adults were also observed in one pool north of the main runway on the east side of the Base and in a wet depression along the railroad right-of-way at Meridian Road.

In the Solano-Colusa Vernal Pool Region, vernal pool fairy shrimp are also reported on the greater Jepson Prairie, which includes the Wilcox Ranch, as well as in the vicinity of Vacaville and Dixon in Solano County. The historical distribution of this species is not known (USFWS 2005); however, the distribution of vernal pool habitats in the areas where this species is not known to occur was once more continuous and larger in area than it is today (Holland 1998). It is likely the vernal pool fairy shrimp once occupied vernal pool habitats throughout a large portion of the Central Valley and southern coastal regions of California (USFWS 2005). Holland (1978) estimated that nearly 4,000,000 acres of vernal pool habitat existed in the Central Valley prior to intensive landuse practices of the mid-1800s.

In the Solano-Colusa Vernal Pool Region, populations of this species are threatened by development on private land, particularly near Fairfield and Vacaville, as well as invasive predator fish introductions. This species is also subject to general threats of vernal pool impacts discussed in Subsection 3.1.

Life History and Ecology

Vernal pool fairy shrimp are uniquely adapted to ephemeral conditions characterized by vernal pool habitats. Helm (1998) determined that this species reaches sexual maturity in average of 41 days, but may be as few as 18 days at optimal conditions. Life cycles are reported to range from 63-147 days, demonstrating that growth rates are dependent on water temperature, which can vary greatly. Vernal pool fairy shrimp co-occur with several other vernal pool crustacean species, including the Conservancy fairy shrimp and the vernal pool tadpole shrimp (USFWS 2005).

Status within the Action Area

Vernal pools within the action area may support suitable habitat for the vernal pool fairy shrimp. Surveys for special status invertebrates have never detected this species within the action area on Base (CH2MHill 2006, included as Appendix D in this BA). Detections have occurred down the slope gradient off Base on the Wilcox Ranch (TNC 2002) and on the Muzzy Ranch (LSA Associates, Inc. 2004). Known sightings of vernal pool fairy shrimp are shown in Figure 4.3.

4.2.5 Vernal Pool Tadpole Shrimp - *Lepidurus packardi*

Description and Listing Status

The vernal pool tadpole shrimp (*Lepidurus packardi)* was listed on September 19, 1994 (59 CFR 48136) as Endangered. Critical habitat was designated on August 6, 2003 (68 CFR 46683) and subsequently revised with critical habitat unit designations on February 10, 2006 (71 CFR 7117). The USFWS published a recovery plan that included this species entitled *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS 2005).

The vernal pool tadpole shrimp is a small crustacean in the Triopsidae family. Tadpole shrimp are aquatic species in the order Notostraca. Members of order Notostraca are known as "living fossils" because of their morphological continuity in the fossil record over the past 2 million years (Longhurst 1955). Vernal pool tadpole shrimp are distinguished by a large, shield-like carapace that covers the anterior side of the body. The adult form of this species measures 0.6 to 3.3 inches long.

Distribution and Threats

The CNDDB reports 226 occurrences of the vernal pool tadpole shrimp in northern California (CNDDB, accessed April 2007). Twenty six occurrences of this species are found in Solano County. Vernal pool tadpole shrimp have not been found within the boundaries of the Base (CH2MHill 2006; EcoAnalysts 2005). They have, however, been found along the railroad right-of-way and in one pool located near the southern boundary of the Base. In 1994, Biosystems found vernal pool tadpole shrimp in one pool located approximately 40 feet from the perimeter fence (near the aircraft parking area) (Biosystems Analysis, Inc. 1994). This species was also observed at eight locations along the railroad right-of-way by EcoAnalysts during the 2004-2005 surveys (EcoAnalysts 2005).

In the Solano-Colusa Vernal Pool Region, vernal pool tadpole shrimp are also reported on the greater Jepson Prairie, which includes the Wilcox Ranch, as well as on the Base, near Montezuma, and on Sacramento National Wildlife Refuge. The historical distribution of this species is not known (USFWS 2005); however, the distribution of vernal pool habitats in the areas where this species is not known to occur were once more continuous and larger in area than they are today (Holland 1998). It is likely the vernal pool tadpole shrimp once occupied vernal pool habitats throughout a large portion of the Central Valley and southern coastal regions of California (USFWS 2005). Holland (1978) estimated that nearly 4,000,000 acres of vernal pool habitat existed in the Central Valley prior to intensive landuse practices of the mid-1800s.

In the Solano-Colusa Vernal Pool Region, populations of this species are threatened by development on private land, particularly near Fairfield and Vacaville, as well as invasive predator fish introductions. This species is also subject to general threats of vernal pool impacts discussed in Subsection 3.1.

Life History and Ecology

Vernal pool tadpole shrimp are uniquely adapted to ephemeral conditions characterized by vernal pool habitats. Helm (1998) determined that this species reaches sexual maturity in average of 54 days. Life cycles are reported to last longer than other vernal pool crustaceans and have relatively higher reproduction rates. After winter rains begin filling a vernal pool, dormant tadpole shrimp cysts may hatch within 4 days (USFWS 2005), and will emerge from cysts as metanauplii, a short stage that lasts 1.5 to 2 hours before molting into a larval form. Vernal pool tadpole shrimp co-occur with several other vernal pool crustacean species, including the Conservancy fairy shrimp and the vernal pool fairy shrimp (USFWS 2005).

Status within the Action Area

Vernal pools within the action area may support suitable habitat for the vernal pool tadpole shrimp. Surveys for special status invertebrates have never detected this species within the action area on Base (CH2MHill 2006, included as Appendix D in this BA). Detections have occurred down the slope gradient off Base on the Wilcox Ranch (TNC 2002) and on the Muzzy Ranch (LSA Associates, Inc. 2004). Known sightings of vernal pool tadpole shrimp are shown in Figure 4.3.

4.2.6 Delta Green Ground Beetle - *Elaphrus viridis*

Species Description and Listing Status

The delta green ground beetle (*Elaphrus viridis)* was listed on August 8, 1980 (45 CFR 62807) as Threatened. Critical habitat was designated on August 8, 1980 (45 CFR 52807). This species was included in a recovery plan published in 1985; however, the USFWS updated recovery planning for the delta green ground beetle by publishing a recovery plan that included this species entitled *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS 2005).

The delta green ground beetle belongs to the family Carabidae. Its size, color, and spotting patterns, lack or reduction of circular pits on the elytra (first pair of wings, which in beetles are hardened and act as a protective covering for the flight wings), and degree of hairiness, distinguish it from other carabid species. Most adults are about 0.25-inch long. They are bright metallic green, generally with bronze spots on the elytra; however, some lack the bronze spots (Goulet 1983).

Distribution and Threats

The CNDDB reports seven occurrences of the delta green ground beetle (CNDDB, accessed April 2007). All seven occurrences of this species are found in Solano County. None of these occurrences are reported from the Base. One of the largest populations of this species was located less than 1.3 miles to the southeast of the project site on Wilcox Ranch (TNC 2002).

Researchers have collected adult beetles around the margins of vernal pools and in bare areas along trails and roadsides in central Solano County (USFWS 2005). The cryptic coloration of the beetle against the brilliant green of the early spring grass and its small size and habit of hiding under low-growing vegetation such as filaree (*Erodium spp*.), hinder detection of the animal in the field.

The widespread loss of wetlands habitat in the Central Valley since the mid 1800s suggests the range of this vernal pool-associated species has been reduced and fragmented by human activities, especially agricultural practices and hydrological manipulations (USFWS 2005). Holland (1978) estimated that nearly 4,000,000 acres of vernal pool habitat existed in the Central Valley prior to intensive landuse practices of the mid-1800s.

Life History and Ecology

The preferred habitat of the delta green ground beetle is not well understood. Some entomologists believe the species prefers more open habitats in the grassland-playa pool matrix where the beetle is found, such as edges of pools, trails, roads, and ditches. However, this may be because denser cover hinders observation of the beetles elsewhere. Adults may also occur in the surrounding grasslands.

Based on the study of similar *Elaphrus* species, researchers believe that delta green ground beetles are generalized predators. Their primary food may be springtails, tiny wingless insects that can flip into the air by releasing a special organ called a furcula, which is normally hooked to their abdomen. Adult females probably produce one generation per year. Adults seem to be active from February until mid-May, after which they enter an inactive phase called a diapause.

Status within the Action Area

Surveys were conducted on the Base in 2005 and the species was not found (EcoAnalysts 2005). The nearest known location of the beetle to the action area is three-quarters of a mile to the southeast on the Wilcox Ranch (TNC 2002). It is unlikely that the species would migrate from the Wilcox Ranch to the LZ project site since they are typically not found more than 500 feet from an occupied pool edge (EcoAnalysts 2005). Known sightings of delta green ground beetle are shown in Figure 4.3.

SECTION 5
EFFECTS OF THE PROPOSED ACTION ON LISTED SPECIES

5.1 DIRECT EFFECTS

Direct effects are considered those effects that occur at or at the time of the Proposed Action (USFWS 1998). A construction activity may be described as initiating a temporary effect or a permanent effect, depending on the activities of each construction activity component. These direct effects would be limited to LZ construction activities. No new utility infrastructure will be constructed outside of the construction footprint. Because recent surveys of vernal pools within the action area found no T&E invertebrate species (vernal pool fairy shrimp, Conservancy fairy shrimp, vernal pool tadpole shrimp, and delta green ground beetle), and because the Contra Costa goldfields would not be affected by the project activities in the action area, only upland habitat associated with the California tiger salamander will be subject to direct effects.

Based on the description of the Proposed Action in Section 2, the amount of California tiger salamander upland habitat subject to removal amounts to 54.4 acres. Subsections 5.1.1 and 5.1.2 discuss each construction activity component in relation to the expected effect duration. Areas within the action area and subject to varying forms of direct effects are shown on Figure 5.1.

5.1.1 Temporary Direct Effects

For the purposes of this BA, temporary direct effects are defined as direct effects that may be restored within a reasonably short time frame. Of the 54.4 acres of California tiger salamander habitat subject to removal, 29.7 acres may be considered a temporary direct effect. Construction activities associated with temporary direct effects include the following components:

- Grading activities of the runway perimeter – 7.6 acres. This activity will occur on all sides of the runway paved surfaces except for the north side. This area will be graded to a slope of 2 to 5 percent, and revegetated. The duration of effect for this construction component in relation to upland habitat exclusion for the California tiger salamander is expected to last 2 years.
- Non-paved area of disturbance associated with construction activities - 22.1 acres. The entire north side of the proposed LZ (bounded by the existing runway) will be affected during construction by use of construction equipment. This area will not be paved, and the area is expected to regain minimum upland habitat characteristics (such as sufficient screening grass and forb cover) within 1 year after completion of the project.

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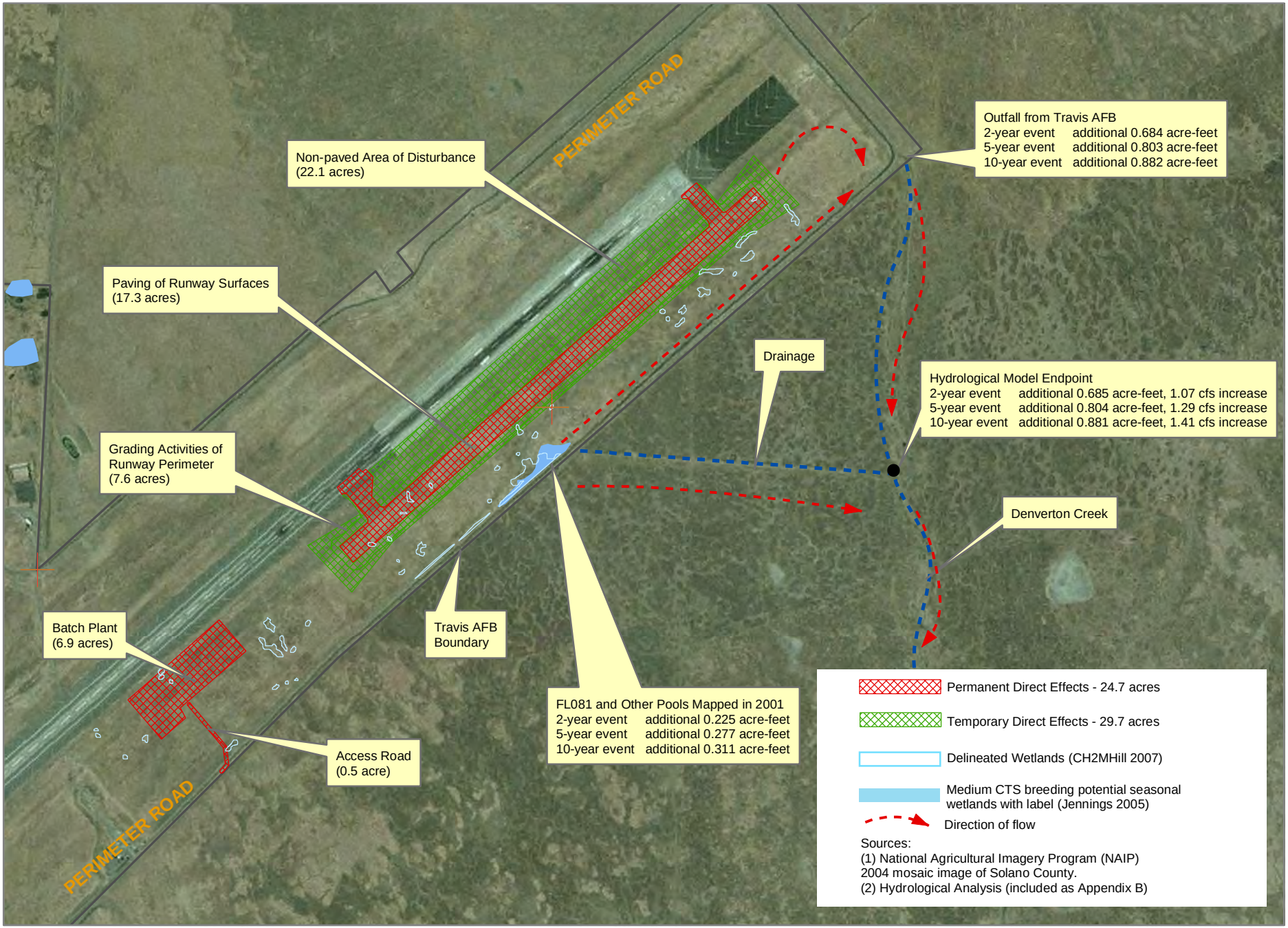


Figure 5.1 Direct and Indirect Effects within the Action Area

Biological Assessment
Permanant Southwestern U.S. C-17 Landing Zone,
Travis AFB, Solano County, California

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5.1.2 Permanent Direct Effects

For the purposes of this BA, permanent direct effects may be defined as direct effects that will forever remove necessary elements that comprise a species' habitat. Of the 54.4 acres of California tiger salamander habitat subject to removal, 24.7 acres will be paved and, therefore, permanently removed from the upland habitat available to California tiger salamanders. Wetland features delineated in 2007 (CH2MHill 2007) will also be subject to permanent direct effects. Construction activities associated with permanent direct effects include the following components:

- Paving the LZ – 17.3 acres. This construction activity will involve paving the LZ surface with a combination of Portland cement and asphalt cement.
- Batch plant construction and access road – 7.4 acres. Construction of the Batch Plant will also include an access road from Perimeter Road. Although the Batch Plant will not be a permanent fixture after construction activities, the area is not expected to assume characteristics of upland habitat within 2 years of cessation of construction activities; therefore, the Batch Plant is considered a permanent direct effect.
- Impacts to waters of the U.S. – Of the 3.45 acres of waters of the U.S. delineated in 2007 within the on-Base portion of the action area (CH2MHill 2007), 0.61 acre of waters of the U.S. will be permanently removed.

5.2 INDIRECT EFFECTS

Indirect effects are defined under the ESA as "…those effects that are caused by, or will result from the Proposed Action later in time, but are still reasonably certain to occur…." (50 CFR 402.02). The major indirect effect of the Proposed Action is the alteration of the hydrologic regime, affecting areas within the action area farther down the slope gradient on the Wilcox Ranch, as well as vernal pools within the action area on the Base property (CH2MHill 2007). Table 5.1 summarizes the overland flow increases for on-Base and off-Base portions of the action area determined by the hydraulic model conducted for the Proposed Action and included as Appendix B. Catchment areas (B-1 and B-2), as well as modeling locations are shown on Figure 5.1. Modeled storm events, as well as model methods and results are discussed in detail in Appendix B.

Table 5.1 Contributions of Flows due to the Proposed Action Off-Base

	On-Base			Off-Base		
Modeled Storm Event[1]	B-1	B-2	B Outfall	D1400		
	Volume (acre-feet)			Volume (acre-feet)	Peak Flow (cfs)	Peak Velocity (ft/sec)
Existing Conditions						
2 year	0.701	2.055	3.771	9.185	12.24	0.78
5 year	1.026	2.659	5.045	13.364	17.72	0.9

Table 5.1 Contributions of Flows due to the Proposed Action Off-Base (*continued*)

Modeled Storm Event[1]	On-Base			Off-Base		
	B-1	B-2	B Outfall	D1400		
	Volume (acre-feet)			Volume (acre-feet)	Peak Flow (cfs)	Peak Velocity (ft/sec)
10 year	1.27	3.089	5.968	16.514	21.86	0.95
Proposed Action						
2 year	0.926	2.513	4.455	9.87	13.31	0.84
5 year	1.303	3.185	5.848	14.168	19.01	0.95
10 year	1.581	3.659	6.85	17.395	23.27	1
Difference						
2 year	0.225	0.458	0.684	0.685	1.07	0.06
5 year	0.277	0.526	0.803	0.804	1.29	0.05
10 year	0.311	0.57	0.882	0.881	1.41	0.05
Marginal Change						
2 year	32.1%	22.3%	18.1%	7.5%	8.7%	7.7%
5 year	27.0%	19.8%	15.9%	6.0%	7.3%	5.6%
10 year	24.5%	18.5%	14.8%	5.3%	6.5%	5.3%

5.2.1 Effects Off-Base within the Action Area

Down-gradient portions of the Wilcox Ranch will be potentially affected by the indirect effects of the addition of paved surfaces. The modeling results (Appendix B) in the hydrological assessment show that runoff volumes and peak flows increased at Denverton Creek with the addition of the LZ. Increases in storm water volume, discharge, and flow velocity may increase scouring potential along drainage features, which may increase sediment contributions to downstream vernal pools. Higher amounts of stormwater pollutants have been known to be associated with sediments from urban areas than from rural areas (Sartor and Boyd 1972). As such, pollutants from the LZ may become attached to storm water sediments and flow off-Base during storm events and into Denverton Creek. The storm water flows will combine with other storm water originating from other areas, which do include agricultural areas. Once in the creek, these flows may come into contact with vernal pool habitat, which may pose a risk to species. Without the mitigating effects of adequate Best Management Practices (BMP), the addition of the LZ impervious cover will cause down-gradient areas on the Wilcox Ranch to be subject to the following (summarized from Appendix B):

- ***Increases in Discharge Volume*** – The percent increases in total storm water volume at Denverton Creek from 2-year, 5-year, and 10-year modeled storm events due to the Proposed Action will be 7.5, 6.0, and 5.3 percent, respectively.

- ***Increases in Peak Flow -*** The percent increases in storm water flows from 2-year, 5-year, and 10-year modeled storm events due to the Proposed Action will be 8.7, 7.3, and 6.5 percent, respectively.
- ***Increases in Peak Flow Velocities*** – The percent increases in peak flow velocities from 2-year, 5-year, and 10-year modeled storm events due to the Proposed Action will be 7.7, 5.6, and 5.3 percent, respectively.
- ***Water quality effects –*** Increases in discharge, flow velocity, and flow volume may increase the contribution of pollutants associated with runway operations. Pollutants of concern for aircraft operations include chemicals used in de-icing operations in the aircraft parking areas on the west side of the airfield and rubber deposited on the LZ from aircraft landing gear tires. De-icing solution is 20 percent ethylene glycol (International Union of Pure and Applied Chemists name Ethane-1,2-diol [IUPAC 2007]) and 80 percent water. The aircraft is sprayed with the product and the over spray is cleaned up using a floor scrubber vehicle. This waste is transferred from the vehicle into drums and picked up by a waste contractor. Most de-icing operations occur in the aircraft parking area (shown on Figure 2.1) and away from storm drains (Pontemayor 2007).

  The build up of rubber can reduce the friction coefficient, causing aircraft tires to slip on the runway when landing and increasing the potential for an aircraft to slide off the runway (Speidel 2002). Residue in rubber materials are considered pollutants, and may accumulate. Rubber removal techniques include high pressure water removal, water-soluble non-toxic chemical removal, or high velocity particle blasting, and are described in Attachment C.
- *Increases in hydroperiods.* By increasing the hydroperiod and by contributing more overland flow into the hydrological system, hydroperiods may increase in length. The additional flow contributions would be expected to lengthen the hydroperiod of vernal pools off Base where Denverton Creek diffuses, affecting the completion of T&E vernal pool species' life cycles. Beneficial effects of an increased hydroperiod may be expected when wet seasons with low precipitation amounts fail to support adequate hydroperiods for the completion of species life cycles. Non-beneficial effects of an increased hydroperiod would be expected in vernal pools with normally shortened hydroperiods that experience a sudden and/or prolonged contribution of surface water. Increasing the hydroperiod in these more "flashy" vernal pools may create conditions more conducive to predatory fish, such as the stickleback.
- *Increases in hydrologic connectivity.* An increased volume and duration of surface flows will increase back-up of water, thereby increasing the duration of hydrologic connectivity between isolated vernal pools. This could increase the likelihood of predatory fish invasions and other invasive species.

As shown in Table 5.1, for storm events with less than a 10-year return period, the resulting flow velocity in the creek is less than 1 foot per second (ft/sec). Velocities in this range could cause erosion dependent on the sediment particle sizes and compaction.

For most particles (larger than 0.001 mm) that are fairly compact (ratio of void volume to solids volume less than 8) will have a strong erosion resistance to flows with velocities less than 1 ft/sec (Collinson and Thompson 1989). Storms with a shorter duration period will result in lower velocities flows and, thus, less erosion. Even though erosion may be a concern, the velocity change from the Proposed Action is less than 0.06 ft/sec from pre-construction velocities.

5.2.2 Effects On-Base within the Action Area

As discussed in Section 5.1.2, wetland features subject to permanent removal will be 0.61 acre. The remaining 2.84 acres delineated in 2007 (CH2MHill 2007) will receive additional overland flow contributions and have increased hydrological connectivity with downstream locations. Most of the wetlands within the action area were determined to not hold water for a sufficient hydroperiod to support breeding habitat for California tiger salamanders (Jennings 2005), nor were T&E invertebrates ever observed in these pools (CH2MHill 2006; CH2MHill 2001). An influx of chemicals associated with runway operations as well as sediment loads from increased flow velocities, along with increased hydrologic connectivity which may facilitate predatory fish introductions from downstream locations.

Although the hydrologic study did not model potential backflows that may occur during a flood event, increased peak flows and peak velocities will increase on-Base backflow potential. Backflows represent an indirect effect to special status species that may occur within the action area by increasing hydrologic connectivity between upslope and downslope areas. Backflow conditions may facilitate invasions of predatory fish and other invasive species.

5.3 CUMULATIVE EFFECTS ANALYSIS

Cumulative effects, as defined by the ESA, are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation (50 CFR 402.02) within the action area (50 CFR 402.02). Areas surrounding the Base are within the City of Fairfield's sphere of influence, which are subject to relatively intense development under the city's general plan (USFWS 2005). The portion of 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. An exception to the deed restriction allows for construction of a runway (for military or civilian use) on Wilcox Ranch. Construction of the Proposed Action LZ within the Base boundary makes construction of a runway on the Wilcox Ranch unlikely. Therefore, no cumulative effects arising from future state or private activities are expected to adversely affect listed species and species habitat.

5.4 CONSERVATION MEASURES TO OFFSET DIRECT AND INDIRECT EFFECTS

5.4.1 Compensatory Mitigation

The Proposed Action will include compensatory mitigation options, such as purchase of conservation easements and/or mitigation bank credit purchases to offset direct effects of California tiger salamander upland habitat removal, as well as indirect effects to vernal pools off-Base.

5.4.2 Storm Water Control Structures

Storm water control structures, such as detention or retention ponds and other structural catchment features, reduce scouring, improve water quality, and minimize flooding. These structures, if placed at the end of discharge outfalls outside the Base, would reduce effects in the down-slope vernal pool area by containing sediments that may contain pollutants. The final design of the LZ should include these structures as a permanent mitigation measure. These hydrological designs should conform to standard BMPs and Standard Operating Procedures for runway construction.

5.4.3 Vegetation Management

The Travis AFB Integrated Natural Resources Management Plan (INRMP) is currently under revision (Williams 2007). The Travis AFB BASH Plan prescribes a vegetation management regime for vegetated areas surrounding runway surfaces, which maintains vegetation as homogeneously as possible. 60 OSS/OSAA is responsible for ground maintenance of grass height between a minimum of 7 inches to a maximum of 14 inches to reduce attractiveness to wildlife/birds. The BASH Plan does not contain a mowing schedule; however, it mandates that grass should be cut before seed heads develop to avoid attracting grain-eating birds. Most of the grass genera in the action area are considered winter annuals (*Avena, Bromus, Hordeum, Vulpia*), which typically develop seed heads in the mid to late spring, and are fully mature by the onset of the dry season. Therefore, spring mowings are required in the BASH Plan. Stands of brush and shrubs are also removed.

The consultation and coordination process for preparation of the INRMP will include a review of BASH requirements and potential mowing scheduling modifications to reduce potential impacts to California tiger salamander upland habitat. To maintain operational safety, vegetation height requirements will not be altered, nor will the intent of mowings to reduce ground forage for birds (or mammals) to attract raptors. Resource agency experts from the California DFG and USFWS may provide suggestions for implementing vegetation management strategies by 60 OSS/OSAA if they do not conflict with the BASH Plan.

5.4.4 Programmatic Agreements and Base Planning

The Base is in the preliminary scoping stages for developing a California tiger salamander programmatic agreement with the USFWS Sacramento Ecological Services Field Office (Williams 2007). To implement a comprehensive strategy for management

of California tiger salamander populations and habitat on the Base, the conservation measures that arise from the consultation process for the Proposed Action will be integrated into the programmatic agreement. Other Base-wide natural resource planning documents will include the conservation measures included in this BA, such as the expected INRMP 2008 update.

SECTION 6
CONCLUSION

Effects of the Proposed Action on listed species were evaluated based on the following definitions (50 CFR 402.02):

- **No effect** – the appropriate conclusion where the Proposed Action will not affect listed species or critical habitat
- **Not likely to adversely affect** – the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those effects extremely unlikely to occur
- **Likely to adversely affect** – the appropriate conclusion if any adverse effect to listed species may occur as a direct or indirect result of the proposed action (including interdependent and interrelated actions), and the effect is not discountable or insignificant.
- **Jeopardize proposed species / adversely modify critical habitat** – the appropriate conclusion if an action would reasonably be expected to directly or indirectly reduce appreciably the likelihood of both the survival and recovery of a listed species by reducing the reproduction, numbers, or distribution of that species, or by modifying critical habitat to the point of preventing the recovery of a listed species.

Based on the definitions above and on the species status descriptions relative to the Proposed Action, this BA concludes the following:

- That the Proposed Action may adversely affect the California tiger salamander by permanently removing 24.7 acres of upland habitat, and temporally removing 29.7 acres of upland habitat. This removal would not represent an adverse modification of habitat essential for recovery of this species. Conservation measures that will reduce the adverse effects associated with California tiger salamander upland habitat removal are included as part of the Proposed Action. In some instances, additional overland flows diffusing onto the Wilcox Ranch may benefit the California tiger salamander by contributing additional water in drier than normal wet seasons, prolonging the hydroperiod for breeding ponds.
- Listed invertebrate animal species included in this BA may be affected, but not adversely affected by the Proposed Action as a result of the indirect effects of the altered hydrological regime. The increase in impervious cover will increase the total volume of water leaving the Base, and increase flow rates and velocity in Denverton Creek, which diffuses onto the Wilcox Ranch. Breeding habitat for the

California tiger salamander will also be subject to these indirect effects associated with hydrological changes due to increases in impervious cover.

- The Contra Costa goldfield will not be adversely affected by the Proposed Action. Habitat for this species will be removed, but removal will not represent an adverse modification of habitat essential to the recovery of this species.
- Delineated wetlands in 2007 within the action area amount to 3.45 acres (CH2MHill 2007). These wetland features include vernal pools, seasonal wetlands, and drainage ditches. Although a final determination of Clean Water Act jurisdiction is forthcoming from the U.S. Army Corps of Engineers Sacramento District, a preliminary determination suggests the wetland features to be jurisdictional waters of the U.S. Of the 3.45 acres delineated, 0.61 acre will be permanently removed and 2.84 acres will be subject to indirect effects due to increased surface flows and increased hydrological connectivity.

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APPENDIX A
CALIFORNIA NATURAL DIVERSITY DATA BASE SPECIES ACCOUNTS

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Ambystoma californiense

California tiger salamander — **Element Code:** AAAAA01180

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:** SC
State: None	**State:** S2S3	

Occurrence No. 81 **Map Index:** 32556 **EO Index:** 28388
Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2006-XX-XX
Site: 2006-XX-XX
Record Last Updated: 2006-10-11

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: OLCOTT LAKE, JEPSON PRAIRIE PRESERVE, WEST OF COOK LANE & EAST OF SACRAMENTO NORTHERN RAILROAD, SW OF DOZIER.

Lat/Long: 38.27069º / -121.82633º
UTM: Zone-10 N4236500 E602666
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 58.5 acres

Township: 05N
Range: 01E
Section: 23 **Qtr:** NE
Meridian: M
Elevation: 18 ft

Occurrence No. 336 **Map Index:** 34153 **EO Index:** 1961
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-05-13
Site: 2002-05-13
Record Last Updated: 2005-06-21

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: 1.8 MILES SW OF DOZIER, 2.2 MILES WNW OF HIGHWAY 113 AT CALHOUN CUT, WEST OF JEPSON PRAIRIE.

Lat/Long: 38.26970º / -121.84368º
UTM: Zone-10 N4236371 E601150
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 05N
Range: 01E
Section: 22 **Qtr:** XX
Meridian: M
Elevation: 25 ft

Occurrence No. 485 **Map Index:** 42796 **EO Index:** 42796
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2006-05-12
Site: 2006-06-07
Record Last Updated: 2007-02-14

Quad Summary: Denverton (3812128/481B)
County Summary: Solano

Location: POTRERO HILLS, 1 MILE SOUTH OF HIGHWAY 12, SE OF FAIRFIELD

Lat/Long: 38.21351º / -121.96751º
UTM: Zone-10 N4230008 E590387
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 0.7 acres

Township: 04N
Range: 01W
Section: 10 **Qtr:** NW
Meridian: M
Elevation: 100 ft

Ambystoma californiense

California tiger salamander **Element Code:** AAAAA01180

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:** SC
State: None	**State:** S2S3	

Occurrence No. 547 **Map Index:** 45867 **EO Index:** 45867
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1983-04-02
Site: 1983-04-02
Record Last Updated: 2001-09-07

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: EAST OF FAIRFIELD, 0.6 AIR MILES SSW OF DOZIER.

Lat/Long: 38.27779º / -121.82360º
UTM: Zone-10 N4237291 E602895
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 05N
Range: 01E
Section: 13 **Qtr:** XX
Meridian: M
Elevation:

Occurrence No. 601 **Map Index:** 46378 **EO Index:** 46378
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1990-04-29
Site: 1990-04-29
Record Last Updated: 2002-07-18

Quad Summary: Birds Landing (3812127/481A), Dozier (3812137/498D)
County Summary: Solano

Location: ABOUT 0.6 MI NORTHEAST OF CREED. VERNAL POOLS ON BOTH SIDES OF THE RR TRACKS.

Lat/Long: 38.25043º / -121.84741º
UTM: Zone-10 N4234229 E600850
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 05N
Range: 01E
Section: 27 **Qtr:** XX
Meridian: M
Elevation: 25 ft

Occurrence No. 828 **Map Index:** 60705 **EO Index:** 60741
Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2005-03-08
Site: 2005-03-08
Record Last Updated: 2005-03-28

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: 1.5 MILES NW OF TRAVIS FIELD, TRAVIS AIR FORCE BASE

Lat/Long: 38.29626º / -121.96218º
UTM: Zone-10 N4239196 E590750
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 05N
Range: 01W
Section: 10 **Qtr:** NW
Meridian: M
Elevation: 100 ft

Ambystoma californiense

California tiger salamander — **Element Code:** AAAAA01180

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:** SC
State: None	**State:** S2S3	

Occurrence No. 872 **Map Index:** 63832 **EO Index:** 63927
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2001-07-06
Site: 2001-07-06
Record Last Updated: 2006-01-31

Quad Summary: Denverton (3812128/481B)
County Summary: Solano

Location: POTRERO HILLS, 1.05 MILE SOUTH OF HIGHWAY 12, SE OF FAIRFIELD

Lat/Long: 38.21237º / -121.95933º
UTM: Zone-10 N4229891 E591105
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 2.0 acres

Township: 04N
Range: 01W
Section: 10 **Qtr:** XX
Meridian: M
Elevation: 200 ft

Occurrence No. 873 **Map Index:** 63833 **EO Index:** 63928
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2006-06-07
Site: 2006-06-07
Record Last Updated: 2007-02-14

Quad Summary: Denverton (3812128/481B)
County Summary: Solano

Location: POTRERO HILLS, 1.3 MILES SOUTH OF HIGHWAY 12, SE OF FAIRFIELD

Lat/Long: 38.20973º / -121.96029º
UTM: Zone-10 N4229597 E591023
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 0.5 acres

Township: 04N
Range: 01W
Section: 10 **Qtr:** NE
Meridian: M
Elevation: 120 ft

Occurrence No. 874 **Map Index:** 63834 **EO Index:** 63929
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2006-05-12
Site: 2006-06-07
Record Last Updated: 2007-02-14

Quad Summary: Denverton (3812128/481B)
County Summary: Solano

Location: POTRERO HILLS, 1.6 MILES SOUTH OF HIGHWAY 12, SE OF FAIRFIELD

Lat/Long: 38.20582º / -121.95994º
UTM: Zone-10 N4229163 E591059
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 04N
Range: 01W
Section: 10 **Qtr:** SE
Meridian: M
Elevation: 150 ft

Ambystoma californiense

California tiger salamander **Element Code:** AAAAA01180

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:** SC
State: None	**State:** S2S3	

Occurrence No. 875 **Map Index:** 63835 **EO Index:** 63930
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2006-05-12
Site: 2006-05-12
Record Last Updated: 2007-02-14

Quad Summary: Denverton (3812128/481B)
County Summary: Solano

Location: POTRERO HILLS, 1.8 MILES SOUTH OF HIGHWAY 12, SE OF FAIRFIELD

Lat/Long: 38.20195º / -121.95145º
UTM: Zone-10 N4228742 E591807
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 2.1 acres

Township: 04N
Range: 01W
Section: 11 **Qtr:** SW
Meridian: M
Elevation: 250 ft

Occurrence No. 876 **Map Index:** 64134 **EO Index:** 64229
Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1999-02-10
Site: 1999-02-10
Record Last Updated: 2006-03-06

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: ON THE NORTH EDGE OF TRAVIS AFB

Lat/Long: 38.28418º / -121.94649º
UTM: Zone-10 N4237871 E592137
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 05N
Range: 01W
Section: 14 **Qtr:** NW
Meridian: M
Elevation: 140 ft

Occurrence No. 883 **Map Index:** 64470 **EO Index:** 64549
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2006-03-13
Site: 2006-03-13
Record Last Updated: 2007-02-26

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: NE OF TRAVIS FIELD, 7 MILES NE OF FAIRFIELD

Lat/Long: 38.28508º / -121.91944º
UTM: Zone-10 N4237998 E594502
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 01W
Section: 13 **Qtr:** NE
Meridian: M
Elevation: 70 ft

Ambystoma californiense

California tiger salamander

Element Code: AAAAA01180

Status		NDDB Element Ranks		Other Lists	
Federal:	Threatened	**Global:**	G2G3	**CDFG Status:**	SC
State:	None	**State:**	S2S3		

Occurrence No. 889 **Map Index:** 66597 **EO Index:** 66736

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2006-03-22
Site: 2006-03-22
Record Last Updated: 2006-10-04

Quad Summary: Elmira (3812138/498C)

County Summary: Solano

Location: 0.3 MILE NE OF VANDEN HIGH SCHOOL, FAIRFIELD.

Lat/Long: 38.28463º / -121.95627º
UTM: Zone-10 N4237912 E591282
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 01W
Section: 15 **Qtr:** NE
Meridian: M
Elevation: 82 ft

Branchinecta conservatio

Conservancy fairy shrimp **Element Code:** ICBRA03010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G1	**CDFG Status:**
State: None	**State:** S1	

Occurrence No. 1 **Map Index:** 34153 **EO Index:** 1960
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1998-01-31
Site: 1998-01-31
Record Last Updated: 2005-06-21

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: 1.8 MILES SW OF DOZIER, 2.2 MILES WNW OF HIGHWAY 113 AT CALHOUN CUT, WEST OF JEPSON PRAIRIE.

Lat/Long: 38.26970º / -121.84368º
UTM: Zone-10 N4236371 E601150
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 05N
Range: 01E
Section: 22 **Qtr:** XX
Meridian: M
Elevation: 25 ft

Occurrence No. 6 **Map Index:** 32556 **EO Index:** 1704
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1997-01-10
Site: 1997-01-10
Record Last Updated: 2006-06-20

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: OLCOTT LAKE, WEST OF COOK LANE & EAST OF SACRAMENTO NORTHERN RAILROAD, SW OF DOZIER.

Lat/Long: 38.27069º / -121.82633º
UTM: Zone-10 N4236500 E602666
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 58.5 acres

Township: 05N
Range: 01E
Section: 23 **Qtr:** NE
Meridian: M
Elevation: 18 ft

Occurrence No. 11 **Map Index:** 41829 **EO Index:** 41829
Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1999-03-11
Site: 1999-03-11
Record Last Updated: 1999-11-02

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: 1.5 MILES WEST OF HIGHWAY 113, 0.25-0.50 MILE SOUTH OF BURKE ROAD, 2 MILES WNW OF DOZIER

Lat/Long: 38.29405º / -121.85090º
UTM: Zone-10 N4239065 E600485
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 19.7 acres

Township: 05N
Range: 01E
Section: 10 **Qtr:** NW
Meridian: M
Elevation: 30 ft

Branchinecta conservatio

Conservancy fairy shrimp — **Element Code:** ICBRA03010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G1	**CDFG Status:**
State: None	**State:** S1	

Occurrence No. 14 **Map Index:** 35356 **EO Index:** 42090
Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1996-02-05
Site: 1996-02-05
Record Last Updated: 1999-12-28

Quad Summary: Denverton (3812128/481B)
County Summary: Solano

Location: POTRERO HILLS LANDFILL, 0.3 MILE SOUTH OF HWY 12, ~2.2 MILES NORTH OF BELDONS LANDING, 5 MILES EAST OF FAIRFIELD.

Lat/Long: 38.22365º / -121.97711º
UTM: Zone-10 N4231124 E589534
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 04N
Range: 01W
Section: 04 **Qtr:** NE
Meridian: M
Elevation: 5 ft

Occurrence No. 17 **Map Index:** 42556 **EO Index:** 42558
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1992-XX-XX
Site: 1992-XX-XX
Record Last Updated: 2000-03-15

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: SEASONAL WETLANDS, 1 MILE SOUTH OF OLCOTT, JEPSON PRAIRIE, 1.5 MILES WEST OF CALHOUN CUT CROSSING BY HIGHWAY 113.

Lat/Long: 38.26344º / -121.83138º
UTM: Zone-10 N4235690 E602235
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 2/5 mile

Township: 05N
Range: 01E
Section: 23 **Qtr:** XX
Meridian: M
Elevation: 20 ft

Occurrence No. 20 **Map Index:** 57480 **EO Index:** 57496
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1993-02-XX
Site: 1993-02-XX
Record Last Updated: 2004-10-19

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: POOLS, ACROSS RAILROAD TRACKS FROM OLCOTT LAKE.

Lat/Long: 38.27305º / -121.83453º
UTM: Zone-10 N4236753 E601945
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 2/5 mile

Township: 05N
Range: 01E
Section: 14 **Qtr:** XX
Meridian: M
Elevation: 20 ft

Branchinecta conservatio

Conservancy fairy shrimp **Element Code:** ICBRA03010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G1	**CDFG Status:**
State: None	**State:** S1	

Occurrence No. 23 **Map Index:** 61653 **EO Index:** 61689
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-02-15
Site: 2002-02-15
Record Last Updated: 2005-06-20

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: ABOUT 3.6 MILES WSW DOZIER.

Lat/Long: 38.26581º / -121.87815º
UTM: Zone-10 N4235903 E598139
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 18.7 acres

Township: 05N
Range: 01E
Section: 21 **Qtr:** XX
Meridian: M
Elevation: 32 ft

Occurrence No. 24 **Map Index:** 61654 **EO Index:** 61690
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-03-25
Site: 2002-03-25
Record Last Updated: 2005-06-20

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: ABOUT 3.5 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.25895º / -121.87197º
UTM: Zone-10 N4235149 E598690
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 29.5 acres

Township: 05N
Range: 01E
Section: 21 **Qtr:** XX
Meridian: M
Elevation: 33 ft

Occurrence No. 25 **Map Index:** 61657 **EO Index:** 61693
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-02-15
Site: 2002-02-15
Record Last Updated: 2005-06-20

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: ABOUT 3.0 MILES WSW DOZIER.

Lat/Long: 38.26436º / -121.86794º
UTM: Zone-10 N4235753 E599034
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 9.9 acres

Township: 05N
Range: 01E
Section: 21 **Qtr:** XX
Meridian: M
Elevation: 34 ft

Branchinecta conservatio

Conservancy fairy shrimp **Element Code:** ICBRA03010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G1	**CDFG Status:**
State: None	**State:** S1	

Occurrence No. 26 **Map Index:** 61647 **EO Index:** 61694
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-02-15
Site: 2002-02-15
Record Last Updated: 2005-06-20

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: ABOUT 4.6 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.26016º / -121.89766º
UTM: Zone-10 N4235255 E596440
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 4.8 acres

Township: 05N
Range: 01E
Section: 20 **Qtr:** XX
Meridian: M
Elevation: 37 ft

Occurrence No. 27 **Map Index:** 61659 **EO Index:** 61695
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-02-15
Site: 2002-02-15
Record Last Updated: 2005-06-20

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: ABOUT 5.0 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.25734º / -121.90547º
UTM: Zone-10 N4234934 E595761
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 26.8 acres

Township: 05N
Range: 01E
Section: 30 **Qtr:** XX
Meridian: M
Elevation: 45 ft

Occurrence No. 28 **Map Index:** 61660 **EO Index:** 61696
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-02-15
Site: 2002-02-15
Record Last Updated: 2005-06-20

Quad Summary: Denverton (3812128/481B)
County Summary: Solano

Location: ABOUT 4.5 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.24711º / -121.88269º
UTM: Zone-10 N4233823 E597767
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 36.9 acres

Township: 05N
Range: 01E
Section: 29 **Qtr:** XX
Meridian: M
Elevation: 36 ft

Branchinecta conservatio

Conservancy fairy shrimp **Element Code:** ICBRA03010

Status		NDDB Element Ranks		Other Lists	
Federal:	Endangered	**Global:**	G1	**CDFG Status:**	
State:	None	**State:**	S1		

Occurrence No. 29 **Map Index:** 61661 **EO Index:** 61697

Dates Last Seen

Occ Rank: Unknown — **Element:** 2002-02-15
Origin: Natural/Native occurrence — **Site:** 2002-02-15
Presence: Presumed Extant
Trend: Unknown — **Record Last Updated:** 2005-06-20

Quad Summary: Dozier (3812137/498D)

County Summary: Solano

Location: ABOUT 3.1 MILES WEST-SOUTHWEST OF DOZIER.

Lat/Long: 38.26950º / -121.87073º
UTM: Zone-10 N4236321 E598784
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 01E
Section: 21 **Qtr:** XX
Meridian: M
Elevation: 35 ft

Branchinecta lynchi

vernal pool fairy shrimp — **Element Code:** ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G3	**CDFG Status:**
State: None	**State:** S2S3	

Occurrence No. 171 **Map Index:** 33701 **EO Index:** 30601 — **Dates Last Seen**
Occ Rank: Unknown — **Element:** 1993-01-16
Origin: Natural/Native occurrence — **Site:** 1993-01-16
Presence: Presumed Extant
Trend: Unknown — **Record Last Updated:** 1997-03-11

Quad Summary: Birds Landing (3812127/481A)
County Summary: Solano

Location: NORTHEAST OF THE INTERSECTION OF FLANNERY ROAD AND GOOSE HAVEN ROAD. NORTH OF THE MONTEZUMA HILLS.

Lat/Long: 38.22069º / -121.83364º — **Township:** 04N
UTM: Zone-10 N4230944 E602097 — **Range:** 01E
Mapping Precision: NON-SPECIFIC — **Section:** 02 **Qtr:** XX
Symbol Type: POINT — **Meridian:** M
Radius: 3/5 mile — **Elevation:** 60 ft

Occurrence No. 184 **Map Index:** 35356 **EO Index:** 31380 — **Dates Last Seen**
Occ Rank: Fair — **Element:** 1996-01-22
Origin: Natural/Native occurrence — **Site:** 1996-01-22
Presence: Presumed Extant
Trend: Unknown — **Record Last Updated:** 1997-08-07

Quad Summary: Denverton (3812128/481B)
County Summary: Solano

Location: POTRERO HILLS LANDFILL, 0.25 MILES SOUTH OF HWY 12, 5 MILES EAST OF FAIRFIELD.

Lat/Long: 38.22365º / -121.97711º — **Township:** 04N
UTM: Zone-10 N4231124 E589534 — **Range:** 01W
Mapping Precision: NON-SPECIFIC — **Section:** 04 **Qtr:** NE
Symbol Type: POLYGON — **Meridian:** M
Area: — **Elevation:** 5 ft

Occurrence No. 218 **Map Index:** 34153 **EO Index:** 41717 — **Dates Last Seen**
Occ Rank: Fair — **Element:** 1997-12-22
Origin: Natural/Native occurrence — **Site:** 1997-12-22
Presence: Presumed Extant
Trend: Unknown — **Record Last Updated:** 2002-07-18

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: 1.8 MILES SW OF DOZIER, 2.2 MILES WNW OF HIGHWAY 113 AT CALHOUN CUT, WEST OF JEPSON PRAIRIE.

Lat/Long: 38.26970º / -121.84368º — **Township:** 05N
UTM: Zone-10 N4236371 E601150 — **Range:** 01E
Mapping Precision: NON-SPECIFIC — **Section:** 22 **Qtr:** XX
Symbol Type: POLYGON — **Meridian:** M
Area: — **Elevation:** 25 ft

Branchinecta lynchi

vernal pool fairy shrimp — **Element Code:** ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G3	**CDFG Status:**
State: None	**State:** S2S3	

Occurrence No. 234 **Map Index:** 42570 **EO Index:** 42570
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2005-02-03
Site: 2005-02-03
Record Last Updated: 2006-03-30

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: NORTH EDGE OF TRAVIS AIR FORCE BASE, NE OF FAIRFIELD.

Lat/Long: 38.28372º / -121.94320º
UTM: Zone-10 N4237823 E592426
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 05N
Range: 01W
Section: 14 **Qtr:** NE
Meridian: M
Elevation: 140 ft

Occurrence No. 245 **Map Index:** 43320 **EO Index:** 43320
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2003-01-XX
Site: 2003-01-XX
Record Last Updated: 2004-10-26

Quad Summary: Dozier (3812137/498D), Elmira (3812138/498C)
County Summary: Solano

Location: NORTH VILLAGE MITIGATION SITE, 2.75 MILES WEST OF HIGHWAY 113, 3.5 MILES WNW OF DOZIER, 4.2 MILES SW OF BINGHAMTON

Lat/Long: 38.30785º / -121.87427º
UTM: Zone-10 N4240572 E598423
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 05N
Range: 01E
Section: 04 **Qtr:** XX
Meridian: M
Elevation: 40 ft

Occurrence No. 313 **Map Index:** 47118 **EO Index:** 47118
Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2001-12-21
Site: 2001-12-21
Record Last Updated: 2002-01-29

Quad Summary: Denverton (3812128/481B)
County Summary: Solano

Location: 1.6 MILES WNW OF DENVERTON; 1.35 MILES (EAST) FROM INTERSECTION OF BRANSCOMBE RD AND SR 12, SOUTH SIDE OF SR 12.

Lat/Long: 38.22834º / -121.92727º
UTM: Zone-10 N4231694 E593891
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 04N
Range: 01W
Section: 01 **Qtr:** NW
Meridian: M
Elevation: 5 ft

Branchinecta lynchi

vernal pool fairy shrimp — **Element Code:** ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G3	**CDFG Status:**
State: None	**State:** S2S3	

Occurrence No. 314 **Map Index:** 47120 **EO Index:** 47120
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2001-12-20
Site: 2001-12-20
Record Last Updated: 2002-01-29

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: 1.2 MILES SOUTH OF BINGHAMPTON, 0.25 MI SOUTH OF FRY RD, & 3.3 MILES NORTH OF DOZIER, EAST SIDE OF SR 113.

Lat/Long: 38.33378º / -121.82292º
UTM: Zone-10 N4243505 E602875
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 06N
Range: 01E
Section: 25 **Qtr:** SW
Meridian: M
Elevation: 30 ft

Occurrence No. 330 **Map Index:** 48425 **EO Index:** 48425
Occ Rank: Poor
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-01-14
Site: 2002-04-02
Record Last Updated: 2002-08-02

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: 3.4 MILES NE OF DOZIER; ALONG EAST SIDE OF ABANDONED SACRAMENTO NORTHERN ELECTRIC RAILROAD GRADE.

Lat/Long: 38.32587º / -121.78096º
UTM: Zone-10 N4242675 E606555
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 06N
Range: 02E
Section: 32 **Qtr:** NW
Meridian: M
Elevation: 15 ft

Occurrence No. 356 **Map Index:** 54516 **EO Index:** 54516
Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1999-03-02
Site: 1999-03-02
Record Last Updated: 2004-03-01

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: 2 MILES SW OF THE INTERSECTION OF HAY ROAD AND HIGHWAY 113, SOUTH OF DIXON

Lat/Long: 38.29338º / -121.84931º
UTM: Zone-10 N4238994 E600625
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 01E
Section: 10 **Qtr:** NE
Meridian: M
Elevation: 30 ft

Branchinecta lynchi

vernal pool fairy shrimp — **Element Code:** ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G3	**CDFG Status:**
State: None	**State:** S2S3	

Occurrence No. 357 **Map Index:** 54517 **EO Index:** 54517 — **Dates Last Seen**
Occ Rank: Excellent — **Element:** 1999-03-02
Origin: Natural/Native occurrence — **Site:** 1999-03-02
Presence: Presumed Extant
Trend: Unknown — **Record Last Updated:** 2004-03-01

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: 1.8 MILES WSW OF THE INTERSECTION OF HAY ROAD AND HIGHWAY 113, SOUTH OF DIXON

Lat/Long: 38.30077º / -121.85071º — **Township:** 05N
UTM: Zone-10 N4239812 E600492 — **Range:** 01E
Mapping Precision: SPECIFIC — **Section:** 03 **Qtr:** SW
Symbol Type: POINT — **Meridian:** M
Radius: 80 meters — **Elevation:** 35 ft

Occurrence No. 358 **Map Index:** 54518 **EO Index:** 54518 — **Dates Last Seen**
Occ Rank: Excellent — **Element:** 1999-03-02
Origin: Natural/Native occurrence — **Site:** 1999-03-02
Presence: Presumed Extant
Trend: Unknown — **Record Last Updated:** 2004-03-01

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: 1.6 MILES WSW OF THE INTERSECTION OF HAY ROAD AND HIGHWAY 113, SOUTH OF DIXON

Lat/Long: 38.30364º / -121.84948º — **Township:** 05N
UTM: Zone-10 N4240132 E600595 — **Range:** 01E
Mapping Precision: SPECIFIC — **Section:** 03 **Qtr:** SE
Symbol Type: POINT — **Meridian:** M
Radius: 80 meters — **Elevation:** 35 ft

Occurrence No. 385 **Map Index:** 61662 **EO Index:** 61698 — **Dates Last Seen**
Occ Rank: Unknown — **Element:** 2002-02-15
Origin: Natural/Native occurrence — **Site:** 2002-02-15
Presence: Presumed Extant
Trend: Unknown — **Record Last Updated:** 2006-03-08

Quad Summary: Denverton (3812128/481B)
County Summary: Solano

Location: ABOUT 5.5 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.24794º / -121.90775º — **Township:** 05N
UTM: Zone-10 N4233889 E595573 — **Range:** 01E
Mapping Precision: NON-SPECIFIC — **Section:** 30 **Qtr:** XX
Symbol Type: POINT — **Meridian:** M
Radius: 1/10 mile — **Elevation:** 42 ft

Branchinecta lynchi

vernal pool fairy shrimp — **Element Code:** ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G3	**CDFG Status:**
State: None	**State:** S2S3	

Occurrence No. 398 **Map Index:** 64296 **EO Index:** 64375
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2005-02-03
Site: 2005-02-03
Record Last Updated: 2006-03-20

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: AT THE END OF MERIDIAN ROAD, ON THE EAST SIDE, SOUTH OF PERIMETER ROAD. ONE MILE EAST OF TRAVIS FIELD.

Lat/Long: 38.27317º / -121.91232º
UTM: Zone-10 N4236684 E595141
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 01E
Section: 18 **Qtr:** XX
Meridian: M
Elevation: 60 ft

Occurrence No. 399 **Map Index:** 64297 **EO Index:** 64376
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2005-02-02
Site: 2005-02-02
Record Last Updated: 2006-03-20

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: ABOUT 0.5 MILE WEST OF TRAVIS AFB.

Lat/Long: 38.26211º / -121.96138º
UTM: Zone-10 N4235407 E590863
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 2/5 mile

Township: 05N
Range: 01W
Section: 22 **Qtr:** XX
Meridian: M
Elevation: 75 ft

Occurrence No. 409 **Map Index:** 64320 **EO Index:** 64398
Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2004-12-29
Site: 2004-12-29
Record Last Updated: 2006-06-20

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: TRAVIS AFB, AT INTERSECTION OF MERIDIAN ROAD AND RAILROAD TRACKS, AND IN POOL SW OF INTERSECTION.

Lat/Long: 38.28534º / -121.91660º
UTM: Zone-10 N4238030 E594751
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 9.1 acres

Township: 05N
Range: 01W
Section: 13 **Qtr:** NE
Meridian: M
Elevation: 60 ft

Elaphrus viridis

Delta green ground beetle — **Element Code:** IICOL36010

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G1	**CDFG Status:**
State: None	**State:** S1	

Occurrence No. 2 **Map Index:** 10558 **EO Index:** 23142
Occ Rank: None
Origin: Natural/Native occurrence
Presence: Extirpated
Trend: Unknown

Dates Last Seen
Element: 1986-XX-XX
Site: 1986-XX-XX
Record Last Updated: 1991-07-24

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: 0.6 MI N OF DOZIER.

Lat/Long: 38.29352º / -121.82053º
UTM: Zone-10 N4239040 E603141
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 05N
Range: 01E
Section: 12 **Qtr:** NW
Meridian: M
Elevation: 15 ft

Occurrence No. 4 **Map Index:** 10451 **EO Index:** 13327
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Fluctuating

Dates Last Seen
Element: 2002-02-21
Site: 2002-02-21
Record Last Updated: 2005-06-20

Quad Summary: Elmira (3812138/498C), Dozier (3812137/498D)
County Summary: Solano

Location: JEPSON PRAIRIE AND VICINITY, SOUTHWEST OF DOZIER.

Lat/Long: 38.26297º / -121.85122º
UTM: Zone-10 N4235616 E600500
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 2,150.4 acres

Township: 05N
Range: 01E
Section: 22 **Qtr:** XX
Meridian: M
Elevation: 30 ft

Occurrence No. 5 **Map Index:** 41827 **EO Index:** 41827
Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1999-03-11
Site: 1999-03-11
Record Last Updated: 1999-11-01

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: 1.6 MILES WEST OF HWY 113 AND 0.25 MILE SOUTH OF BURKE ROAD, 2 MILES WNW OF DOZIER.

Lat/Long: 38.29637º / -121.85295º
UTM: Zone-10 N4239321 E600302
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 01E
Section: 10 **Qtr:** NW
Meridian: M
Elevation: 30 ft

Elaphrus viridis

Delta green ground beetle — **Element Code:** IICOL36010

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G1	**CDFG Status:**
State: None	**State:** S1	

Occurrence No. 6 **Map Index:** 61647 **EO Index:** 61683
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-02-21
Site: 2002-02-21
Record Last Updated: 2005-06-20

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: ABOUT 4.6 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.26016º / -121.89766º
UTM: Zone-10 N4235255 E596440
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 4.8 acres

Township: 05N
Range: 01E
Section: 20 **Qtr:** XX
Meridian: M
Elevation: 37 ft

Occurrence No. 7 **Map Index:** 61648 **EO Index:** 61684
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-02-21
Site: 2002-02-21
Record Last Updated: 2005-06-20

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: ABOUT 5.0 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.25712º / -121.90577º
UTM: Zone-10 N4234910 E595735
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 21.7 acres

Township: 05N
Range: 01E
Section: 30 **Qtr:** XX
Meridian: M
Elevation: 47 ft

Occurrence No. 8 **Map Index:** 61649 **EO Index:** 61685
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-02-21
Site: 2002-02-21
Record Last Updated: 2005-06-20

Quad Summary: Denverton (3812128/481B)
County Summary: Solano

Location: ABOUT 4.6 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.24766º / -121.88685º
UTM: Zone-10 N4233880 E597403
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 23.9 acres

Township: 05N
Range: 01E
Section: 29 **Qtr:** XX
Meridian: M
Elevation: 36 ft

Elaphrus viridis

Delta green ground beetle — **Element Code:** IICOL36010

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G1	**CDFG Status:**
State: None	**State:** S1	

Occurrence No. 9 **Map Index:** 61650 **EO Index:** 61686

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-02-21
Site: 2002-02-21
Record Last Updated: 2005-06-20

Quad Summary: Denverton (3812128/481B)
County Summary: Solano

Location: ABOUT 4.3 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.24640º / -121.88060º
UTM: Zone-10 N4233747 E597951
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 3.5 acres

Township: 05N
Range: 01E
Section: 29 **Qtr:** XX
Meridian: M
Elevation: 36 ft

Lepidurus packardi

vernal pool tadpole shrimp — **Element Code:** ICBRA10010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G3	**CDFG Status:**
State: None	**State:** S2S3	

Occurrence No. 26 **Map Index:** 32460 **EO Index:** 1767
Occ Rank: Poor
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1995-04-26
Site: 1995-04-26
Record Last Updated: 1999-12-16

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: VACAVILLE; 1.1 KM NE OF ELMIRA ROAD X INTERSTATE ROUTE 80.

Lat/Long: 38.36062º / -121.96860º
UTM: Zone-10 N4246331 E590110
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 06N
Range: 01W
Section: 15 **Qtr:** SW
Meridian: M
Elevation: 130 ft

Occurrence No. 37 **Map Index:** 34153 **EO Index:** 1959
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1998-01-31
Site: 1998-01-31
Record Last Updated: 2005-06-20

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: 1.8 MILES SW OF DOZIER, 2.2 MILES WNW OF HIGHWAY 113 AT CALHOUN CUT, WEST OF JEPSON PRAIRIE.

Lat/Long: 38.26970º / -121.84368º
UTM: Zone-10 N4236371 E601150
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 05N
Range: 01E
Section: 22 **Qtr:** XX
Meridian: M
Elevation: 25 ft

Occurrence No. 45 **Map Index:** 32549 **EO Index:** 1701
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1993-02-07
Site: 1993-02-07
Record Last Updated: 1997-01-21

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: E OF DOZIER; ON WEST SIDE OF SALEM ROAD, 2.1 KM S OF BROWN ROAD X SALEM ROAD.

Lat/Long: 38.28742º / -121.79637º
UTM: Zone-10 N4238390 E605263
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 02E
Section: 07 **Qtr:** SW
Meridian: M
Elevation: 13 ft

Lepidurus packardi

vernal pool tadpole shrimp — **Element Code:** ICBRA10010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G3	**CDFG Status:**
State: None	**State:** S2S3	

Occurrence No. 49 **Map Index:** 32556 **EO Index:** 17942
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2003-05-28
Site: 2003-05-28
Record Last Updated: 2005-01-10

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: OLCOTT LAKE, SW OF DOZIER

Lat/Long: 38.27069º / -121.82633º
UTM: Zone-10 N4236500 E602666
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 58.5 acres

Township: 05N
Range: 01E
Section: 23 **Qtr:** NE
Meridian: M
Elevation: 18 ft

Occurrence No. 97 **Map Index:** 33690 **EO Index:** 30600
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1999-03-09
Site: 1999-03-09
Record Last Updated: 2000-03-14

Quad Summary: Denverton (3812128/481B)
County Summary: Solano

Location: SOUTHEAST OF THE INTERSECTION OF HIGHWAY 12 AND SCALLY ROAD, NORTH OF POTRERO HILLS AND SOUTH OF TRAVIS AIR FORCE BASE.

Lat/Long: 38.22497º / -121.96640º
UTM: Zone-10 N4231281 E590470
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 7.8 acres

Township: 04N
Range: 01W
Section: 03 **Qtr:** XX
Meridian: M
Elevation: 10 ft

Occurrence No. 98 **Map Index:** 33700 **EO Index:** 30544
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1992-05-11
Site: 1992-05-11
Record Last Updated: 1997-03-11

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: SOUTHWEST OF THE INTERSECTION OF HWY 113 AND COOK LANE. SOUTHWEST OF DOZIER.

Lat/Long: 38.27890º / -121.83310º
UTM: Zone-10 N4237404 E602063
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 05N
Range: 01E
Section: 14 **Qtr:** XX
Meridian: M
Elevation: 25 ft

Lepidurus packardi

vernal pool tadpole shrimp — **Element Code:** ICBRA10010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G3	**CDFG Status:**
State: None	**State:** S2S3	

Occurrence No. 99 **Map Index:** 33699 **EO Index:** 30543 — **Dates Last Seen**
Occ Rank: Unknown — **Element:** 1993-02-07
Origin: Natural/Native occurrence — **Site:** 1993-02-07
Presence: Presumed Extant
Trend: Unknown — **Record Last Updated:** 1997-03-11

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: NORTHEAST OF THE INTERSECTION OF HWY 113 AND HASTINGS ROAD. ENE OF DOZIER.

Lat/Long: 38.29263º / -121.79550º — **Township:** 05N
UTM: Zone-10 N4238970 E605331 — **Range:** 02E
Mapping Precision: NON-SPECIFIC — **Section:** 07 **Qtr:** XX
Symbol Type: POINT — **Meridian:** M
Radius: 3/5 mile — **Elevation:** 10 ft

Occurrence No. 111 **Map Index:** 35356 **EO Index:** 31379 — **Dates Last Seen**
Occ Rank: Good — **Element:** 2000-03-16
Origin: Natural/Native occurrence — **Site:** 2000-03-16
Presence: Presumed Extant
Trend: Unknown — **Record Last Updated:** 2000-11-09

Quad Summary: Denverton (3812128/481B)
County Summary: Solano

Location: ALONG POTRERO HILLS LANE, 0.5 MILE SW OF THE INTERSECTION OF SCALLY ROAD AND HIGHWAY 12, SE OF FAIRFIELD

Lat/Long: 38.22365º / -121.97711º — **Township:** 04N
UTM: Zone-10 N4231124 E589534 — **Range:** 01W
Mapping Precision: NON-SPECIFIC — **Section:** 04 **Qtr:** NE
Symbol Type: POLYGON — **Meridian:** M
Area: — **Elevation:** 5 ft

Occurrence No. 141 **Map Index:** 41829 **EO Index:** 41832 — **Dates Last Seen**
Occ Rank: Excellent — **Element:** 1999-03-11
Origin: Natural/Native occurrence — **Site:** 1999-03-11
Presence: Presumed Extant
Trend: Unknown — **Record Last Updated:** 1999-11-03

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: 1.5 MILES WEST OF HIGHWAY 113 AND 0.25-0.50 MILE SOUTH OF BURKE ROAD, 2 MILES WNW OF DOZIER.

Lat/Long: 38.29405º / -121.85090º — **Township:** 05N
UTM: Zone-10 N4239065 E600485 — **Range:** 01E
Mapping Precision: SPECIFIC — **Section:** 10 **Qtr:** NW
Symbol Type: POLYGON — **Meridian:** M
Area: 19.7 acres — **Elevation:** 30 ft

Lepidurus packardi

vernal pool tadpole shrimp — **Element Code:** ICBRA10010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G3	**CDFG Status:**
State: None	**State:** S2S3	

Occurrence No. 142 **Map Index:** 41833 **EO Index:** 41833
Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1999-03-11
Site: 1999-03-11
Record Last Updated: 1999-11-03

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: 1.8 MILES WEST OF HIGHWAY 113 AND 0.25 MILE SOUTH OF BURKE ROAD, 2 MILES WNW OF DOZIER

Lat/Long: 38.29398º / -121.85659º
UTM: Zone-10 N4239052 E599987
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 01E
Section: 10 **Qtr:** NW
Meridian: M
Elevation: 30 ft

Occurrence No. 143 **Map Index:** 41839 **EO Index:** 41839
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1999-03-05
Site: 1999-03-05
Record Last Updated: 1999-11-03

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: UPPER END OF BARKER SLOUGH, NW OF JEPSON PRAIRIE AND WSW OF ARGYLLE PARK RACETRACK, 11 MILES SOUTH OF DIXON.

Lat/Long: 38.27959º / -121.84021º
UTM: Zone-10 N4237473 E601440
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 15.0 acres

Township: 05N
Range: 01E
Section: 14 **Qtr:** NW
Meridian: M
Elevation: 20 ft

Occurrence No. 154 **Map Index:** 42555 **EO Index:** 42555
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1992-XX-XX
Site: 1992-XX-XX
Record Last Updated: 2000-03-15

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: SEASONAL LAKE, JUST EAST OF HIGHWAY 113 & JEPSON PRAIRIE, 0.6 MILE NORTH OF DOZIER.

Lat/Long: 38.29491º / -121.81882º
UTM: Zone-10 N4239196 E603289
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 05N
Range: 01E
Section: 12 **Qtr:** XX
Meridian: M
Elevation: 15 ft

Lepidurus packardi

vernal pool tadpole shrimp — **Element Code:** ICBRA10010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G3	**CDFG Status:**
State: None	**State:** S2S3	

Occurrence No. 155 **Map Index:** 42556 **EO Index:** 42556
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1992-XX-XX
Site: 1992-XX-XX
Record Last Updated: 2000-03-15

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: SEASONAL WETLANDS, 1 MILE SOUTH OF OLCOTT, JEPSON PRAIRIE, 1.5 MILES WEST OF CALHOUN CUT CROSSING BY HIGHWAY 113.

Lat/Long: 38.26344º / -121.83138º
UTM: Zone-10 N4235690 E602235
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 2/5 mile
Township: 05N
Range: 01E
Section: 23 **Qtr:** XX
Meridian: M
Elevation: 20 ft

Occurrence No. 158 **Map Index:** 43444 **EO Index:** 43444
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-04-01
Site: 2002-04-01
Record Last Updated: 2002-08-01

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: PARKER RANCH, 0.1 TO 0.2 MILE EAST INTERSECT OF WALTERS ROAD AND AIRBASE PARKWAY, ~2.5 MILES WEST OF TRAVIS FIELD.

Lat/Long: 38.27172º / -121.98603º
UTM: Zone-10 N4236450 E588695
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 15.2 acres
Township: 05N
Range: 01W
Section: 21 **Qtr:** NW
Meridian: M
Elevation: 45 ft

Occurrence No. 159 **Map Index:** 43445 **EO Index:** 43445
Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2000-07-06
Site: 2000-07-06
Record Last Updated: 2000-08-15

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: 3.5 MILES SW OF DOZIER, 1.8 MILES WEST OF WEST END CALHOUN CUT.

Lat/Long: 38.25569º / -121.86862º
UTM: Zone-10 N4234790 E598987
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 54.7 acres
Township: 05N
Range: 01E
Section: 28 **Qtr:** XX
Meridian: M
Elevation: 33 ft

Lepidurus packardi

vernal pool tadpole shrimp — **Element Code:** ICBRA10010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G3	**CDFG Status:**
State: None	**State:** S2S3	

Occurrence No. 223 **Map Index:** 61653 **EO Index:** 61701 — **Dates Last Seen**
Occ Rank: Unknown — **Element:** 2002-02-15
Origin: Natural/Native occurrence — **Site:** 2002-02-15
Presence: Presumed Extant
Trend: Unknown — **Record Last Updated:** 2005-06-20

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: ABOUT 3.6 MILES WSW DOZIER.

Lat/Long: 38.26581º / -121.87815º — **Township:** 05N
UTM: Zone-10 N4235903 E598139 — **Range:** 01E
Mapping Precision: SPECIFIC — **Section:** 21 **Qtr:** XX
Symbol Type: POLYGON — **Meridian:** M
Area: 18.7 acres — **Elevation:** 32 ft

Occurrence No. 224 **Map Index:** 61666 **EO Index:** 61702 — **Dates Last Seen**
Occ Rank: Unknown — **Element:** 2002-03-25
Origin: Natural/Native occurrence — **Site:** 2002-03-25
Presence: Presumed Extant
Trend: Unknown — **Record Last Updated:** 2005-06-20

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: ABOUT 3.5 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.25778º / -121.86674º — **Township:** 05N
UTM: Zone-10 N4235024 E599149 — **Range:** 01E
Mapping Precision: SPECIFIC — **Section:** 21 **Qtr:** XX
Symbol Type: POLYGON — **Meridian:** M
Area: 35.4 acres — **Elevation:** 34 ft

Occurrence No. 225 **Map Index:** 61667 **EO Index:** 61703 — **Dates Last Seen**
Occ Rank: Unknown — **Element:** 2002-02-15
Origin: Natural/Native occurrence — **Site:** 2002-02-15
Presence: Presumed Extant
Trend: Unknown — **Record Last Updated:** 2005-06-20

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: ABOUT 3.0 MILES WSW DOZIER.

Lat/Long: 38.26430º / -121.86822º — **Township:** 05N
UTM: Zone-10 N4235746 E599010 — **Range:** 01E
Mapping Precision: SPECIFIC — **Section:** 21 **Qtr:** XX
Symbol Type: POLYGON — **Meridian:** M
Area: 14.1 acres — **Elevation:** 34 ft

Lepidurus packardi

vernal pool tadpole shrimp — **Element Code:** ICBRA10010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G3	**CDFG Status:**
State: None	**State:** S2S3	

Occurrence No. 226 **Map Index:** 61647 **EO Index:** 61704
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-02-15
Site: 2002-02-15
Record Last Updated: 2005-06-20

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: ABOUT 4.6 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.26016º / -121.89766º
UTM: Zone-10 N4235255 E596440
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 4.8 acres

Township: 05N
Range: 01E
Section: 20 **Qtr:** XX
Meridian: M
Elevation: 37 ft

Occurrence No. 227 **Map Index:** 61659 **EO Index:** 61705
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-02-15
Site: 2002-02-15
Record Last Updated: 2005-06-20

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: ABOUT 5.0 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.25734º / -121.90547º
UTM: Zone-10 N4234934 E595761
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 26.8 acres

Township: 05N
Range: 01E
Section: 30 **Qtr:** XX
Meridian: M
Elevation: 45 ft

Occurrence No. 228 **Map Index:** 61670 **EO Index:** 61706
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-02-15
Site: 2002-02-15
Record Last Updated: 2005-06-20

Quad Summary: Denverton (3812128/481B), Elmira (3812138/498C)
County Summary: Solano

Location: ABOUT 4.5 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.24780º / -121.88418º
UTM: Zone-10 N4233899 E597636
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 41.7 acres

Township: 05N
Range: 01E
Section: 29 **Qtr:** XX
Meridian: M
Elevation: 36 ft

Lepidurus packardi

vernal pool tadpole shrimp — **Element Code:** ICBRA10010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G3	**CDFG Status:**
State: None	**State:** S2S3	

Occurrence No. 229 **Map Index:** 61662 **EO Index:** 61707
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-05-13
Site: 2002-05-13
Record Last Updated: 2006-03-08

Quad Summary: Denverton (3812128/481B)
County Summary: Solano

Location: ABOUT 5.5 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.24794º / -121.90775º
UTM: Zone-10 N4233889 E595573
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 05N
Range: 01E
Section: 30 **Qtr:** XX
Meridian: M
Elevation: 42 ft

Occurrence No. 230 **Map Index:** 61672 **EO Index:** 61708
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-02-15
Site: 2002-02-15
Record Last Updated: 2005-06-21

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: ABOUT 5.0 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.26201º / -121.90152º
UTM: Zone-10 N4235457 E596100
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 01E
Section: 19 **Qtr:** XX
Meridian: M
Elevation: 42 ft

Occurrence No. 231 **Map Index:** 61673 **EO Index:** 61709
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-02-15
Site: 2002-02-15
Record Last Updated: 2005-06-21

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: ABOUT 3.4 MILES WEST-SOUTHWEST OF DOZIER.

Lat/Long: 38.27269º / -121.87934º
UTM: Zone-10 N4236665 E598026
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 22.3 acres

Township: 05N
Range: 01E
Section: 17 **Qtr:** XX
Meridian: M
Elevation: 34 ft

Lepidurus packardi

vernal pool tadpole shrimp — **Element Code:** ICBRA10010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G3	**CDFG Status:**
State: None	**State:** S2S3	

Occurrence No. 232 **Map Index:** 61661 **EO Index:** 61710
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-02-15
Site: 2002-02-15
Record Last Updated: 2005-06-21

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: ABOUT 3.1 MILES WEST-SOUTHWEST OF DOZIER.

Lat/Long: 38.26950º / -121.87073º
UTM: Zone-10 N4236321 E598784
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 01E
Section: 21 **Qtr:** XX
Meridian: M
Elevation: 35 ft

Occurrence No. 233 **Map Index:** 61675 **EO Index:** 61711
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-03-25
Site: 2002-03-25
Record Last Updated: 2005-06-21

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: ABOUT 2.6 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.26080º / -121.85604º
UTM: Zone-10 N4235371 E600080
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 6.6 acres

Township: 05N
Range: 01E
Section: 22 **Qtr:** XX
Meridian: M
Elevation: 29 ft

Occurrence No. 234 **Map Index:** 61676 **EO Index:** 61712
Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2002-04-02
Site: 2002-04-02
Record Last Updated: 2005-06-21

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: ABOUT 2.5 MILES SOUTHWEST OF DOZIER.

Lat/Long: 38.26705º / -121.85667º
UTM: Zone-10 N4236064 E600017
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 01E
Section: 22 **Qtr:** XX
Meridian: M
Elevation: 32 ft

Lepidurus packardi

vernal pool tadpole shrimp — **Element Code:** ICBRA10010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G3	**CDFG Status:**
State: None	**State:** S2S3	

Occurrence No. 236 **Map Index:** 64319 **EO Index:** 64399

Dates Last Seen
Element: 2004-12-29
Site: 2004-12-29

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Record Last Updated: 2006-03-22

Quad Summary: Elmira (3812138/498C)
County Summary: Solano

Location: TRAVIS AFB, AT INTERSECTION OF MERIDIAN ROAD AND RAILROAD TRACKS.

Lat/Long: 38.28697º / -121.91476º
UTM: Zone-10 N4238213 E594909
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 01W
Section: 12 **Qtr:** XX
Meridian: M
Elevation: 60 ft

Occurrence No. 237 **Map Index:** 64349 **EO Index:** 64428

Dates Last Seen
Element: 2004-12-14
Site: 2004-12-14

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Record Last Updated: 2006-03-27

Quad Summary: Dozier (3812137/498D)
County Summary: Solano

Location: ALONG RAILROAD RIGHT-OF-WAY BETWEEN MERIDIAN ROAD AND ROUTE 113.

Lat/Long: 38.28608º / -121.86029º
UTM: Zone-10 N4238171 E599675
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 64.8 acres

Township: 05N
Range: 01E
Section: 10 **Qtr:** XX
Meridian: M
Elevation: 35 ft

APPENDIX B
HYDROLOGICAL ASSESSMENT

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Hydrological Assessment

The Air Force is proposing to construct a new landing zone (LZ) and conduct additional C-17 operations (Proposed Actions) at Travis Air Force Base (the Base). Construction includes paving of new runway surfaces and connector taxiways that will create an impervious cover (IC) where permeable soil currently exists. For the hydrologic assessment, the paved surface (17.3 acres) of the proposed LZ is the construction activity that will be permanent and is the only part of the Proposed Action that is considered for hydrologic analysis. The proposed LZ will affect one of the three drainage basins in the vicinity of the Base (see Figure 2.1 of the Biological Assessment [BA]).

This Hydrological Assessment (HA), which supports the BA, was prepared to understand how storm water runoff patterns change (runoff volume, flow rate, and flow velocity) due to the proposed LZ. The focuses of the HA are the hydrological effects on and off-Base. The on-Base effects are located in the area next to the proposed LZ with a focus in the immediate vicinity of vernal pool FL081. The off-Base effects considered are located at the downstream continuation point of Denverton Creek located southeast of the Base. Flows from the creek, once on a level terrain, may have the potential of reaching vernal pools down slope of the Base.

The technical analysis includes determination of rainfall, quantification of change in IC, assessment of hydraulics, and analyses of outputs to determine the changes in flow patterns. Three storm events were used to formulate various scenarios with pre-post construction comparisons to evaluate change.

B.1 LAND USE AND DRAINAGE

Past land use practices and grading activities associated with the original airfield construction leveled much of the characteristic mima-mound topography. Consequently, many of the vernal pools were either filled in or the surrounding upland area was altered sufficiently to decrease sheet flow contribution of surface water into remnant pools. The new runway construction and connector taxiways, which will require clearing, grubbing, and paving of land surfaces that now retain most rain water, will reduce infiltration of rainfall, likely resulting in a change in flow patterns. The LZ is not the only area that will contribute rainfall to the vernal pool area, and to understand the full effect, the proposed LZ must be considered in concert with the surrounding watersheds in the basin. Land use is described in Section B1.1, and drainage patterns are described in Section B1.2.

B1.1 Land use

Determination of storm water runoff is dependent on land use and soil conditions. These elements are used to determine how much water is stored during a rainfall event and the time rainfall travels overland (rainfall or runoff). The more impervious a surface is (*e.g.,* a runway is nearly 100% impervious) the quicker it becomes runoff.

B1.1.1 Proposed LZ Construction

The proposed LZ is on the eastern edge of the Base, and is part of the Solano-Colusa Vernal Pool Region, characterized by periodic alkaline basins and vegetation of the Sacramento Valley (USFWS 2005). Descriptions of land use on the Base and the vernal pool region serve as the basis for assigning hydrological parameters to calculate rainfall runoff. The model included land use attributes before and after construction. For the purposes of this HA, only LZ construction aspects that permanently affect soil permeability were considered.

Other elements of the LZ construction are temporary and include contractor staging and hauling operations, batch plant construction and operation, and utility infrastructure installment. It is assumed these areas will be restored close to their original condition or will not increase in IC. The grading limits were established through a conservative conceptual design of the new LZ runway and connector taxiways. The area associated with final construction of the LZ amounts to 17.3 acres. The limits will be wider than existing limits because the new runway finished grade surface is approximately 18 inches higher than the existing runway surface, *i.e.*, the grading limits extend farther to match the existing ground at the proposed toe-of-slope. These limits extend to within 80 feet to 90 feet of the LZ centerline along all edges.

B1.1.2 Surrounding Area of the LZ

The vegetation community surrounding the LZ is best described as a degraded vernal pool / grassland complex because of alterations to the surface, introduction of grasses, and land maintenance activities. One of the largest modifications to the surface was the construction of Runway 03R/21L and Perimeter Road, which altered the local hydrology. The drainage path that once connected portions west of the Runway 03R/21L to areas east of the Base is now dissected by the area surrounding the Runway 03R/21L, which is contained by Perimeter Road. Construction of Perimeter Road effectively created a long linear berm that apparently facilitates water collection and extends the hydroperiod of depressions adjacent to the road (Parsons 2007). One vernal pool, designated as "FL081" by Jennings (2005), is formed primarily by the road. FL081, although outside the project footprint and not subject to removal, is the most significant vernal pool feature on the Base in the immediate vicinity of the proposed LZ. The Base vegetation management regime for vegetated areas surrounding runway surfaces specifies



Picture of Perimeter Road, view to SE, carmera at ground level



Vernal Pool FL081, view to NE

a 7 inch to a maximum 14-inch cut to reduce attractiveness to wildlife/birds, which maintains the vegetation as homogeneously as possible (Travis AFB 2006).

The LZ is within the Solano-Colusa Vernal Pool Region, characterized by periodic alkaline basins surrounded by upland herbaceous-dominant vegetation of the Sacramento Valley (USFWS 2005). The region is a relatively large area covering the majority of Solano County and ranging northward from the low lying plains adjacent to the Suisun Marsh and the Sacramento-San Joaquin Delta through the Colusa Basin of western Sacramento Valley to the vicinity of Princeton, Glenn County. It is best known for well-represented examples of Northern claypan pools. These pools comprise up to several acres and may occur singly or in small aggregations. Many of the pool areas in the region were converted to agriculture or developed as residential, commercial, or industrial developments. Soil underlying most of the claypan pools in the vicinity of the Base and Jepson Prairie is Pescadero clay loam or Sycamore series.

B1.1.3 Modeling Land Uses

Parsons (2007) categorized the vernal pool / grassland complex into three vegetation community types: mostly introduced grasses for grazing; grass laden depression areas (swales); and vernal pools that intermittently hold water. For modeling purposes the vernal pool area may be regarded as a single type that is considered a continuous non-grazed grass meadow with a sandy clay loam soil. The area next to runways is considered maintained open space. The following are the three land use types in the central basin (defined in Section B1.2.1 below):

- Grassy meadows: areas with unmaintained grass and mostly in natural state;
- Open space: parks, large lawns, *etc*. that are mostly grass; and
- Impervious areas: runways.

Other land use types on Base are mostly urban in nature, but because they are not inside the central basin they are not considered in this HA. These areas are fully developed urban areas with maintained landscapes (residential houses and commercial districts with large building surrounded by parking lots).

B1.2 Model Elements

The elements of the model that represent the basin are watersheds, catchment areas, water courses, and other hydraulic features (outfalls and culverts). Models are more

representative of actual conditions when the watershed can be depicted at a fine resolution. A fine resolution is achieved when a watershed is depicted in the model with small homogenous catchment areas where most infrastructure features such as swales, pipes, and other water courses are represented. Different land use conditions within the watershed (*i.e.,* changes in IC) can be modeled under different rainfall conditions to understand how development may affect part of a watershed.

B1.2.1 Drainage Areas

A watershed is the enclosed land area that drains water into a conveyance system (*e.g.,* river or creek). The watershed for this HA was delineated using topographic information while elevation data was useful for showing where mounds and depressions that influence hydrology are formed. The limits of the watershed were drawn by starting at a low point of interest, typically a creek intersection, or outfall. The limit is the perimeter at which the highest elevation is reached from the point forming an enclosed polygon. Numerous watersheds can join to form a basin, where multiple basins can join to form the drainage area for a larger river system.

There are three drainage basins in the vicinity of the Base. A western basin drains the majority of the Base and is completely to the west of the Proposed Action. This basin has residential areas with storm water infrastructure (*i.e.,* pipes and inlets) that generates stormwater flows due to development. The LZ will not add to the IC of this basin. A northeastern basin is adjacent to the northeast corner of the Base and drains due east. It completely resides outside the Base perimeter and is not affected by the LZ. The central basin has three separate watersheds and is directly affected by the LZ. Figure B.1 shows the central watershed and identifies drainage features, Denverton Creek, and the general location proposed LZ.

The three distinct areas of the central basin that contribute storm water runoff to Denverton Creek are (1) the grassy meadow land outside the Base to the northwest (Watershed A), (2) the maintained open space adjacent to the eastern two thirds of the east runway (Watershed B), and the grassy meadow north of the LZ (Watershed C). Figure B.1 presents the three watersheds with representative catchment areas. Watersheds A and B are composed of catchment areas that are delineated based on drainage laterals such as swales. Storm water flows in Watershed C follow mostly a natural terrain until reaching the edge of the Base. The slope of the area and the terrain characteristics are used to determine flow resistance. Table B.1 provides information for the three watersheds, each with its associated land use areas before and after construction.

B1.2.2 Swales and Outfalls

Swales and creeks are the principal water courses in this HA, both of which eventually discharge through an outfall to Denverton Creek. Swales are typically adjacent to major roadways and taxiways, while creeks are mostly outside the Base. Although storm water infrastructure exists in the residential areas (*i.e.,* pipes and inlets), it mostly occurs away from the central basin. Therefore, for this HA, the majority of the conduits are swales. The only pipe conduits are underneath Runway 03R/21L and

through Perimeter Road. Table B.2 provides information on the swales, culverts, and channels in the central basin.



Outfall onto Wilcox Ranch from Base, View to South

Two major Base outfalls as well as one off-Base outfall discharge storm water runoff from the central basin to Denverton Creek. The construction of Runway 03R/21L altered the local hydrology of this creek. The drainage path that once connected portions west of the LZ (catchment area A-2) to areas east of the Base is now dissected by the area contained by Perimeter Road. A subsurface storm sewer routes runoff from this area (runway culvert), as well as catchment area A-1 and discharges it to a channel (Channel A) that takes the storm water runoff east where it reconnects with the Denverton Creek (Junction ABC). Watershed C was also dissected by Runway 03R/21L and flows around the LZ and Perimeter Road to another channel (Channel BC) that flows south and discharges to the creek's continuation. Watershed B is completely contained by Perimeter Road and is the area where the Proposed Action takes place. There are four catchment areas in this watershed that culminate at the most eastern corner of catchment area B-1 (Junction B) and leave the Base through a culvert (Culvert B) that connects with the channel draining Watershed C (Outfall BC). Water from Watersheds B and C flows south to the juncture of the creek's continuation with the channel from Watershed A (Junction ABC). The confluence of swales is considered a junction for modeling purposes but have no significant hydraulic effect.

B.3 MODEL DEVELOPMENT

Model development involves selecting representative storm events and assigning attributes to the model elements. The purpose of the model is to estimate the effects of the Proposed Action on runoff within the watershed under three storm durations and the effects on Denverton Creek flows. The resolution of the model is such that it can be used to understand the relative change from development on the Base. It allows identification of potential problem areas, parameters of concern, or other features that can be used to guide more detailed investigations. The performance measures of interest are related to volumetric, temporal, and intensity changes in flows. This section describes the modeling software, major elements of the model, storms considered, and description of the performance measures. Resolution of the model is adequate for the purpose of this HA; however, the accuracy of the model could be enhanced with additional data collection, detailed system inventory, land use analysis, geographic survey, and flow monitoring if further detailed analysis is required.

B.3.1 Software

The model chosen for this study is PondPack by Bentley Systems, Inc. The software is approved by the Federal Emergency Management Agency and is capable of performing hydrology calculations related to watershed, channels, outfalls, and ponds. It is a stand-alone software package that aids in the design process for analyzing, evaluating, and sizing various elements of a storm drainage system. A graphic user interface allows streamline development of network layouts, data entry, and output viewing. The key feature is that it attenuates flows and accounts for travel time as storm water flows are routed through a variety of different shaped channels. PondPack has a library of rainfall and infiltration constants as well as methods for developing peak flow and hydrographs. PondPack's reporting and graphing features can export graphics and tables in a variety of formats. This software matches other types of hydrologic models, but has the advantage of analyzing ponds. However, because the majority of the central basin did not have sizable ponds, the software was used to analyze mostly swales and outfalls. The model was left in a state that can be used to evaluate storm water control features such detention ponds for future analysis.

B 3.2 Storm Events

The model is capable of simulating various types of storm events. A storm event is defined by the probability or frequency of how often it occurs (*e.g.*, once every 2 years), the duration it lasts, in hours, and how much precipitation falls. Another consideration is the nature of how the precipitation falls over the event duration, *i.e.*, the rate of rainfall over the storm duration. This is related to the curve that is created with rainfall rates, such as inches per hour (in/hour), and plotted over the duration of a storm at equal time intervals (15 minutes as typical). Table B.3 summarizes the rainfall information for the Solano County, California, used for the analyses (NOAA 1973).

A storm period of 6 hours was chosen for determining runoff volumes (the 24-hour period is also included but was not used). The Natural Resource Council Services (NRCS) developed rainfall rate data for northern California. The two synthetic 24-hour rainfall distribution types are type I and IA storms (NOAA 1986). Types I and IA represent the Pacific maritime climate with wet winters and dry summers. Because Type IA is the least intense, Type I storms were used for this study. This would allow for evaluation of the worst case, and mitigation measures prescribed would be the most conservative.

B 3.3 Modeling Network

A drainage system conveys storm water runoff from catchment areas through channels and pipes to water bodies. Each of these elements is represented in the model by a graphical figure that contains attributes necessary for computing hydraulic conditions (see Figure B.2). The catchment areas of the watersheds are represented by icons, which are connected by channels to two different types of points: junction points and an end-of-system (EOS) point.

A catchment area has three key elements: the type of land use, type of hydrologic soil group (HSG), and condition. These two elements determine what is known an SCS

Runoff Curve Number (CN). The CN value is what is used for determining how much rainfall is absorbed before runoff occurs, *i.e.*, the initial abstraction. Table B.4 has information on coefficients related to the type of land use and condition.

Channels, pipes, and the direction of overland flow are represented by conduit linear icons. Table B.5 contains a list of the type of conduit elements and their related attributes. The natural drainage path of a catchment basin is represented by a hydraulic flow path that represents the direction of overland flow.

Point icons can represent conduit junctions, outfalls, and the system end points. Channel and flow path confluences are labeled according to the upstream catchment or watershed areas. Outfall junctions are labeled according to their upstream watershed. The model allows for one EOS point that represents the most downstream point of the hydraulic system. Point D1400 is located 1,400 feet downstream of the confluence of Channels A and BC (junction point ABC) that contains all of the flows from the central basin.

B3.4 Outputs

The main concerns related to flow pattern changes are runoff volume available to the vernal pools and the manner in which that water is discharged (flow rate and flow velocity). Decreases in runoff volume will make less water available to wildlife, and high flow velocity may induce soil scour or flooding. The rainfall runoff can be evaluated through an x-y graph known as a hydrograph. This graph can be used to determine both the quantity of water delivered at a given point over time and flow velocity. It is a function of the time it takes water originating in all basins to travel from the hydraulically most distant point of the watershed to a point of interest within the watershed, known as the time of concentration (T_c). T_c influences the shape and peak of the runoff hydrograph. Urbanization usually decreases T_c, thereby increasing the peak discharge. But T_c can be increased as a result of (a) ponding behind small or inadequate drainage systems, including storm drain inlets and road culverts, or (b) reduction of land slope through grading.

The model is able to provide hydrographs for any point, reach, or basin in the system. Figure 3.2 of the BA provides an example of the flow rate at the downstream point of the Denverton Creek under a 2-year 6-hour storm prior to the LZ construction. The x-axis provides the time after the storm event began with the y-axis providing the flow rate in cubic feet per second (cfs). The line indicates the accumulated flows from all basins overtime at the most downstream section of the system. The runoff volume is computed by summing the area under the curve. Each channel has fixed hydraulic properties and by knowing the flow rate it is possible to determine velocity. The peak discharge was 12.3 cfs at 8.4 hours after the storm began. The volume associated with this storm event was 9.187 acre-ft with a maximum velocity of 0.78 ft/sec. Multiple graphs can be superimposed on each other so changes can be observed.

B.4 IMPACT OF THE PROPOSED ACTION

The configuration of the storm drain system, Runway 03R-21L, and Perimeter Road currently prohibits any rainfall runoff from traveling across the LZ. This avoidance is achieved through the immediate capture of runoff adjacent to the runways and containment of all flows in conduits, routing to off-Base channels, and discharge to the continuance of Denverton Creek. Storm water runoff from the LZ (Watershed B) is discharged directly to off Base channels that flow to Denverton Creek. Rainfall runoff rerouted from Watersheds A and C eventually are reconnected to their original destination, and the only change in flow pattern is in intensity (cfs over the duration of the storm), not quantity (total acre-feet). Once runoff is in the creek, it follows along its natural path into the vernal pool area.

Any loss of water could cause pools to dry up, or excessive flooding events could erode habitat and displace species. The addition of IC will add runoff volume and increase flow rates. Thus, the focus of this HA is on storm water runoff effects adjacent to the runway and at Denverton Creek. The model results present the potential difference in flow patterns on and off Base after completion of the LZ.

Water quality is not part of this HA. Appendix C of the BA contains water quality information.

B4.1 Modeling results

The drainage system was simulated with three 6-hour storm events with 2, 5, and 10-year return periods, and performance measures were evaluated on Base at catchment areas B-1 and B-2 (flow paths B1, flow path B2, and outfall B), and off Base at Denverton Creek at the EOS point labeled "D1400." Table B.6 provides a comparison of the pre and post construction modeling results at the on and off-Base points of interest. Table B.7 provides the key model results for all model elements: runoff volume, peak flow rates, and peak flow velocity (flow velocity was performed outside the modeling software and not included in the model output tables). Figure B.3 presents the hydrograph for flow paths B1, flow path B2, and D1400 for the three design storms under pre and post construction conditions. Flow paths B1 and B2 are associated with on-Base effects, and the D1400 is associated with off-Base effects. Flow paths of B1 and B2 are mostly overland flow with some storm water collection at adjacent minor swales. Because of the overland flow within B1 and B2, flow velocities were not calculated and the discussion will be restricted to total volume effects.

B4.1.1 On Base Results

The on- Base result associated with the LZ are related to catchment areas B-1 and B-2. These areas lie on either side of the LZ and are affected by overland sheet flow originating on the LZ. Catchment area B-1 had no IC prior to construction, and post construction IC will be 6.9 acres. For the 2-year storm, this increase caused an increase of 0.225 acre-feet of runoff volume (32.1% increase). Catchment area B-2 had a 35 percent increase in IC, which resulted in a 0.458 acre-feet increase of runoff volume (22.3%%).

With regard to vernal pool FL081, the LZ will add additional volumes of water. The water that will arrive will only be from the part of the catchment basin that resides upstream of the pool. This area is associated with just over two-thirds of the catchment basin, but less than one half of the LZ. Therefore, the effects from the LZ in the vicinity of FL081 are projected to have an additional volumes of runoff as compared to pre construction volumes; however, the effects are likely to be less in the vernal pool part of the catchment basin than downstream of the pool.

Although overland flows in catchment areas B-1 and B-2 were not modeled, the flows are likely to increase. The flow velocities would be dependent on the final grade of the surface after construction and the vegetative cover in the area. High grass cover and a relatively flat slope would provide for low velocities and, thus, minimal erosion.

B4.1.2 Off Base Results

Results of the model show that the pattern of flow changes due to runway construction. Considering the 2-year storm, runoff volumes increased in the watershed by 0.684 acre-feet (18.1% increase) and D1400 by 0.685 acre-feet (7.5% increase). Peak flows increased at D1400 by 1.07 cfs (8.7% increase) with a change in velocity of 0.06 ft/sec (7.7% increase). Overall, catchment area B-2 had the highest increase in volume when considering the three storms, and catchment area B-1 experienced the highest marginal gain. This may change dependent on the delineation of the basin, but the result reflects the capacity to change due to the IC. Flows at the D1400 increased; however, due to the influence of the other watersheds, the marginal flows seen downstream were less than upstream sections. All runoff volumes increase as rainfall increases, but the marginal changes decrease because, as the soil becomes saturated, it no longer absorbs water and approaches impervious conditions.

The model results show that runoff volumes and peak flows increased at Denverton Creek with the addition of the LZ. The runoff volume at the creek increased by 0.685 acre-feet associated with the increase in catchment areas B-1 and B2, but, because of Watersheds A and B, the increase was only 7.5 percent. The peak flows also increased with higher frequency storms, but also saw a marginal decrease. Figure B.1 provides a comparison of the pre and post construction effects under the three storm conditions.

Most particles (larger than 0.001 mm) that are fairly compact (ratio of void volume to solids volume less than 8) will have a strong erosion resistance to flows with velocities less than 1 ft/sec (Collinson and Thompson 1989). The new LZ caused less than a 0.06 ft/sec increase in Denverton Creek (7.7% increase). The resulting peak flow velocity in Denverton Creek is less than 1 ft/sec for storm events with less than a 10-year return period before and after construction. Thus, flow velocities in the creek are not likely to cause erosion and less so in the flatter terrain of the vernal pool area. Storms with a shorter duration period will result in lower peak velocities and less erosion. Even though erosion may be a concern, the change from the LZ is less than 0.06 ft/sec when compared to pre-construction flows, and is considered minimal.

B.4.2 Modeling Conclusions

Construction of Perimeter Road caused changes to natural hydraulics where today rainfall runoff from Runway O3R-21L is routed through swales and culverts to the original flow course (Denverton Creek). This drainage system configuration will limit storm water runoff effects from the LZ to the downstream creek. The proposed LZ construction will add IC within the Base; however, the hydraulic effects are limited to Watershed B within the Base (on-Base effects) and within Denverton Creek (off-Base effects).

Simulation results show that additional IC in catchment areas B-1 and B-2 results in increased storm water runoff volumes in Watershed B. The on-Base runoff volumes increased by 32.1 percent in the adjacent catchment area south of the LZ, 22 percent increase north of the LZ, and 18.1 percent overall when combined with the remaining catchment areas of Watershed B. Vernal pool FL081 is present in a part of catchment area B-1 that would be less hydraulically impacted by the LZ than the downstream part of the same area. This vernal pool area will be sensitive to the final grading and vegetative cover after construction.

Denverton Creek experiences higher peak flows and volumes with some minor increase to flow velocities. The runoff volume in Denverton Creek was less than that of Watershed B. The flow velocities in the Denverton creek increase by less than 0.06 ft/sec for storms with a return period of less than 10 years and is considered minimal. As a result, the creek would receive additional runoff volumes with each storm event, but would not likely cause erosion. If water from the creek flows to the vernal pool area (Wilcox Ranch) these pools would receive the additional flow. The overland flow of the pool area greatly reduces flow velocity, and erosion is not a concern.

In conclusion, the LZ would increase runoff volumes to FL081 from overland flow leaving the LZ. Erosion near FL081 could be a concern if slopes are high and grass is not maintained. The LZ is likely to increase runoff volume in the vernal pool area from storm water flows leaving the Base through Denverton Creek with minimal erosion effects in the creek and in the vernal pool area.

Table B.1
Land Use Data

Watershed	Area Total (acres)	Pre-construction Land Use Areas (acres)			Post-construction Land Use Areas (acres)			Length (ft)	Slope (ft/ft)
		IC	Open Space	Grass meadow	IC	Open Space	Grass meadow		
A-1	90.5	16.0	74.5		16.0	74.5		4,000	0.0067
A-2	593			593			593	13,000	0.0030
B-1	83.5		83.5		6.9	76.6		7,700	0.0034
B-2	92.3	29.0	63.3		39.1	53.2		7,900	0.0016
B-3	51.7	9.8	41.9		9.8	41.9		3,800	0.0024
B-4	10.4		10.4			10.4		2,900	0.0031
C	212			212			212	8,500	0.0031
Total	**1133.7**	**54.8**	**273.6**	**805.3**	**17.0**				

Note: new impervious area subtracts from grass meadow or open space.

Table B.2
Drainage Feature Data

Conduit ID	Type	Specification	Length (ft)	Slope (ft/ft)
Runway culvert	Closed pipe conduit	36 inch diameter	1400	0.0043
A channel	Earth, fairly uniform section	Dense weeds/ plants	2400	0.0017
B34 swale	Swale, maintained vegetation	Grass 4” -6”	800	0.0019
B234 swale	Swale, maintained vegetation	Grass 4” -6”	500	0.001
B culvert	Closed pipe conduit	36 inch diameter	80	0.0025
BC channel	Earth, fairly uniform section	Dense weeds/ plants	2500	0.00072
Creek	Unmaintained, uncut weeds/bush	Dense brush, high stage	1400	0.00576

Table B.3
Rainfall Amount (inches)

Duration	Return Period		
	2-years	5-years	10-years
6 hours	1.4	1.5	1.6
24 hours	2.4	2.9	3.5

Source National Oceanographic and Atmospheric Administration, *Precipitation-Frequency Atlas of the Western United States* (Silver Spring, Maryland, 1973), pp. 25-27, 37-39. Online. Available at: http://hdsc.nws.noaa.gov/hdsc/pfds/other/nca_pfds.html. Accessed: July 22, 2007.

Table B.4
Land Use Runoff Coefficients

Description	Condition	CN
Fully Developed Urban Areas: Open space	Good: grass cover > 75%	74
Impervious Areas: Runway	Independent of condition	98
Other Agricultural Lands	Meadow - cont. grass (non grazed)	71

Source: Bently library of curve number values

Table B.5
Conduit Parameter

Type	Condition	Manning's n
Closed pipe conduit	36 inch diameter	0.012 - 0.014
Earth, fairly uniform section	Dense weeds/ plants	0.030 - 0.035
Swale with maintained vegetation	Grass 4" -6"	0.05- 0.09
Not maintained, weeds and brush uncut	Dense brush, high stage	0.10 - 0.14

Source: Bently library of Manning's n values

Table B.6
Proposed Action Effects

	On Base			Off Base		
Storm Event	B-1	B-2	B Outfall	D1400		
	Volume (acre-feet)			Volume (acre-feet)	Peak Flow (cfs)	Peak Velocity (ft/sec)
Preconstruction						
2 year	0.701	2.055	3.771	9.185	12.24	0.78
5 year	1.026	2.659	5.045	13.364	17.72	0.9
10 year	1.27	3.089	5.968	16.514	21.86	0.95
Postconstruction						
2 year	0.926	2.513	4.455	9.87	13.31	0.84
5 year	1.303	3.185	5.848	14.168	19.01	0.95
10 year	1.581	3.659	6.85	17.395	23.27	1
Difference						
2 year	0.225	0.458	0.684	0.685	1.07	0.06
5 year	0.277	0.526	0.803	0.804	1.29	0.05
10 year	0.311	0.57	0.882	0.881	1.41	0.05
Marginal Change						
2 year	32.1%	22.3%	18.1%	7.5%	8.7%	7.7%
5 year	27.0%	19.8%	15.9%	6.0%	7.3%	5.6%
10 year	24.5%	18.5%	14.8%	5.3%	6.5%	5.3%

Table B.7
Model Results
(6 hour storm duration)

PRE-CONSTRUCTION

Node ID	Return Type	HYG Vol Event	Qpeak ac-ft	Trun	Qpeak hrs	cfs
A OUTFALL	JCT	2	4.333		6.3000	5.14
A OUTFALL	JCT	5	6.595		6.3500	7.29
A OUTFALL	JCT	10	8.324		6.6000	8.98
A-1	AREA	2	1.292		5.3000	4.02
A-1	AREA	5	1.759		5.0000	5.44
A-1	AREA	10	2.099		5.0000	6.50
A-2	AREA	2	3.041		10.4000	4.07
A-2	AREA	5	4.837		10.4000	6.45
A-2	AREA	10	6.226		10.4000	8.27
A1-2	JCT	2	4.333		6.2500	5.15
A1-2	JCT	5	6.595		6.5500	7.30
A1-2	JCT	10	8.324		6.5500	8.99
ABC	JCT	2	9.187		7.9500	12.30
ABC	JCT	5	13.366		7.9500	17.78
ABC	JCT	10	16.516		7.9500	21.92
B OUTFALL	JCT	2	3.771		7.5000	6.36
B OUTFALL	JCT	5	5.045		7.5000	8.50
B OUTFALL	JCT	10	5.968		7.4500	10.05
B-1	AREA	2	.701		7.5000	1.48
B-1	AREA	5	1.026		7.5000	2.16
B-1	AREA	10	1.270		7.5000	2.67
B-2	AREA	2	2.055		9.2000	3.05
B-2	AREA	5	2.659		9.2000	3.94
B-2	AREA	10	3.089		9.2000	4.58
B-3	AREA	2	.830		6.4500	2.19
B-3	AREA	5	1.114		6.0000	2.91
B-3	AREA	10	1.320		6.0000	3.44
B-4	AREA	2	.187		5.3000	.56
B-4	AREA	5	.248		5.1000	.74
B-4	AREA	10	.291		4.9500	.87
B2-3-4	JCT	2	3.071		7.2000	4.89
B2-3-4	JCT	5	4.020		7.0500	6.37
B2-3-4	JCT	10	4.699		7.0000	7.44
B3-4	JCT	2	1.017		6.0500	2.71
B3-4	JCT	5	1.362		6.0000	3.60
B3-4	JCT	10	1.611		6.0000	4.24
BC	JCT	2	4.859		8.0500	8.16
BC	JCT	5	6.776		7.7500	11.36
BC	JCT	10	8.196		7.5500	13.75
C	AREA	2	1.088		8.8500	1.98
C	AREA	5	1.731		8.2000	3.13
C	AREA	10	2.228		8.2000	4.03
D1400	JCT	2	9.185		8.3500	12.24
D1400	JCT	5	13.364		8.3000	17.72
D1400	JCT	10	16.514		8.2500	21.86

Table B.7
Model Results (continued)
(6-hour storm duration)

POST-CONSTRUCTION

Node ID	Return HYG Vol Type	Event	Qpeak ac-ft	Trun	Qpeak hrs	cfs
A OUTFALL	JCT	2	4.333		6.3000	5.14
A OUTFALL	JCT	5	6.595		6.3500	7.29
A OUTFALL	JCT	10	8.324		6.6000	8.98
A-1	AREA	2	1.292		5.3000	4.02
A-1	AREA	5	1.759		5.0000	5.44
A-1	AREA	10	2.099		5.0000	6.50
A-2	AREA	2	3.041		10.4000	4.07
A-2	AREA	5	4.837		10.4000	6.45
A-2	AREA	10	6.226		10.4000	8.27
A1-2	JCT	2	4.333		6.2500	5.15
A1-2	JCT	5	6.595		6.5500	7.30
A1-2	JCT	10	8.324		6.5500	8.99
ABC	JCT	2	9.871		8.0500	13.38
ABC	JCT	5	14.170		8.0000	19.08
ABC	JCT	10	17.397		7.9500	23.34
B OUTFALL	JCT	2	4.455		7.5000	7.44
B OUTFALL	JCT	5	5.848		7.5000	9.78
B OUTFALL	JCT	10	6.850		7.5000	11.46
B-1	AREA	2	.926		7.5000	1.95
B-1	AREA	5	1.303		7.5000	2.74
B-1	AREA	10	1.581		7.5000	3.31
B-2	AREA	2	2.513		9.2000	3.73
B-2	AREA	5	3.185		9.2000	4.72
B-2	AREA	10	3.659		9.2000	5.42
B-3	AREA	2	.830		6.4500	2.19
B-3	AREA	5	1.114		6.0000	2.91
B-3	AREA	10	1.320		6.0000	3.44
B-4	AREA	2	.187		5.3000	.56
B-4	AREA	5	.248		5.1000	.74
B-4	AREA	10	.291		4.9500	.87
B2-3-4	JCT	2	3.529		7.2500	5.49
B2-3-4	JCT	5	4.546		7.1500	7.06
B2-3-4	JCT	10	5.269		7.1000	8.18
B3-4	JCT	2	1.017		6.0500	2.71
B3-4	JCT	5	1.362		6.0000	3.60
B3-4	JCT	10	1.611		6.0000	4.24
BC	JCT	2	5.543		8.0500	9.26
BC	JCT	5	7.579		7.8500	12.65
BC	JCT	10	9.077		7.5500	15.16
C	AREA	2	1.088		8.8500	1.98
C	AREA	5	1.731		8.2000	3.13
C	AREA	10	2.228		8.2000	4.03
D1400	JCT	2	9.870		8.3500	13.31
D1400	JCT	5	14.168		8.3000	19.01
D1400	JCT	10	17.395		8.2500	23.27

Figure B.1 – Hydrological Study Area

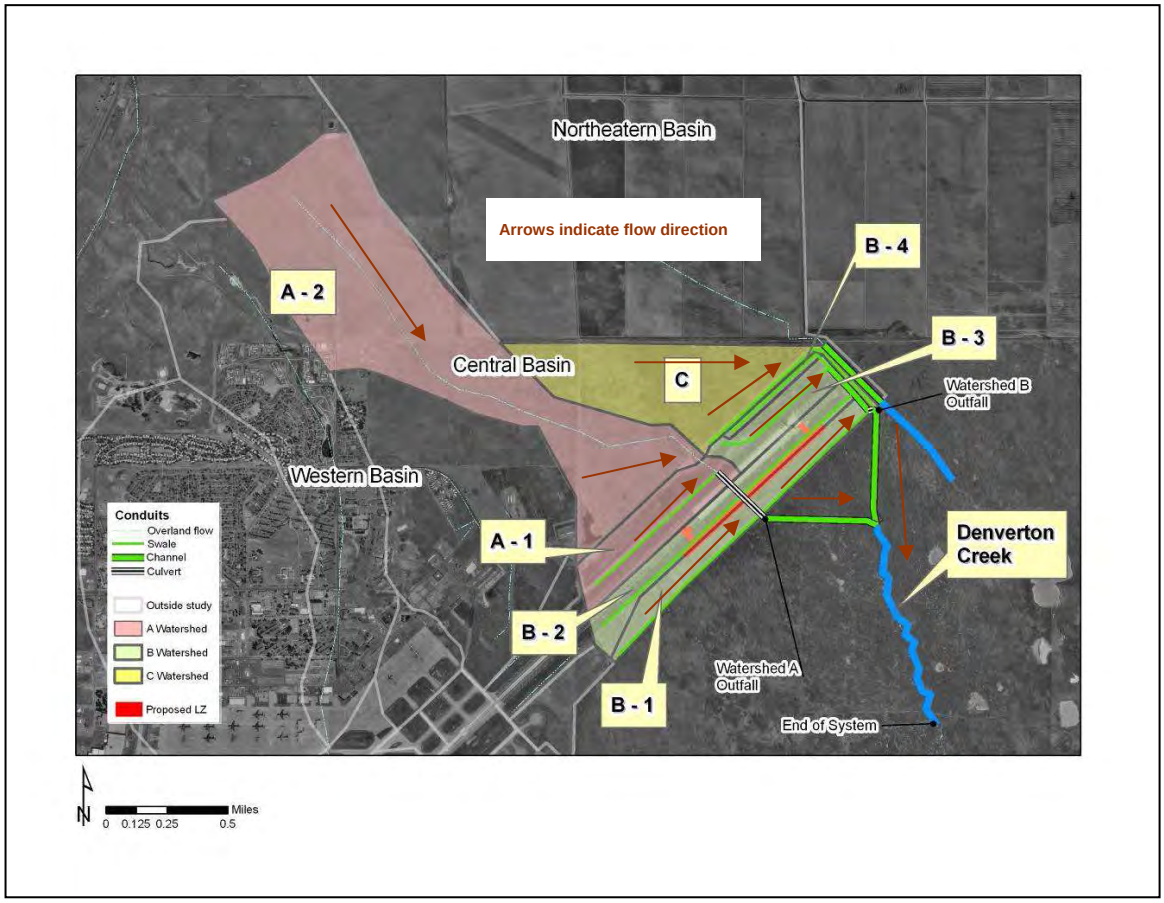


Figure B.2- Modeling Network

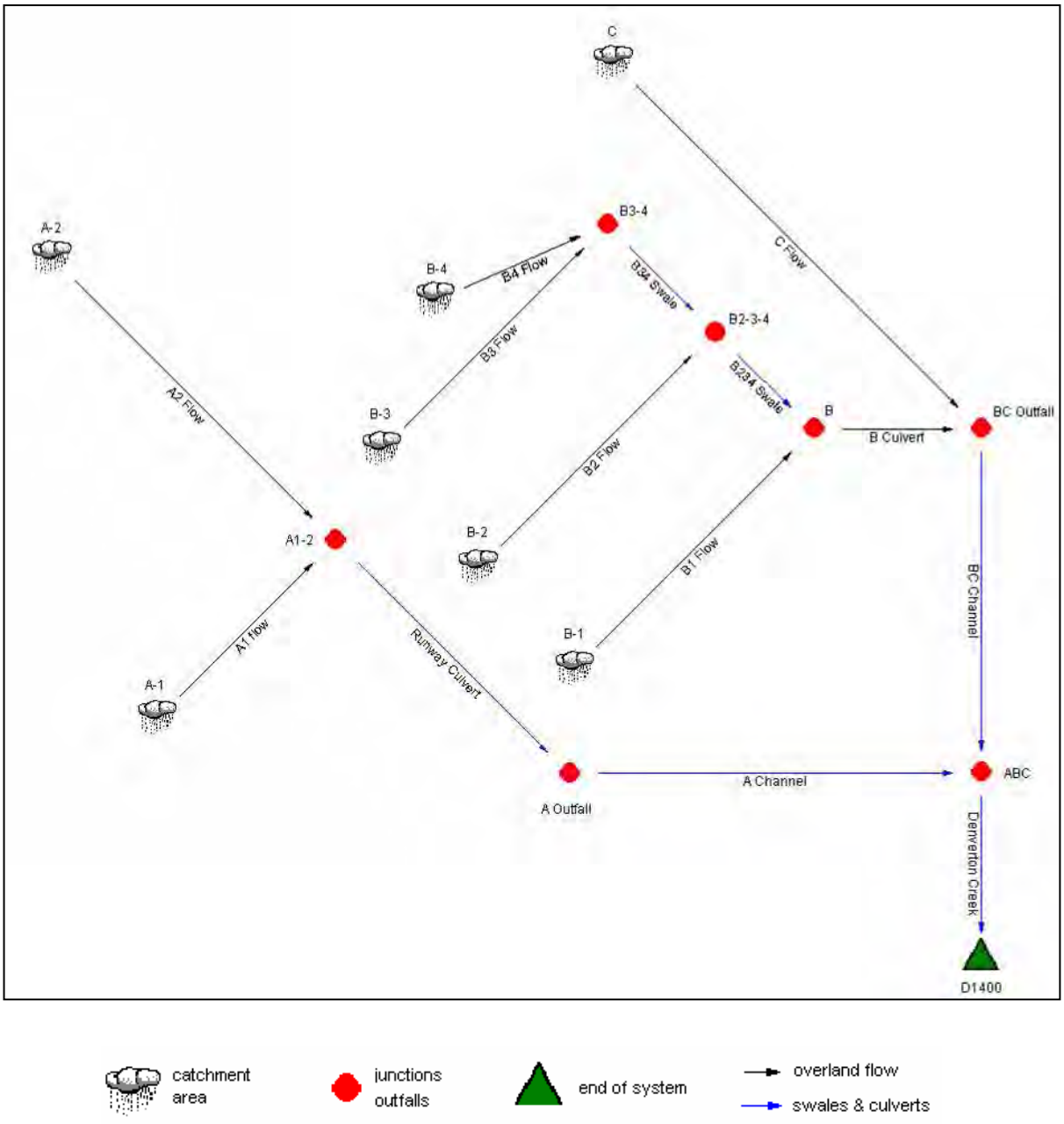


Figure B.3 – Example Hydrograph
(Downstream point of creek)

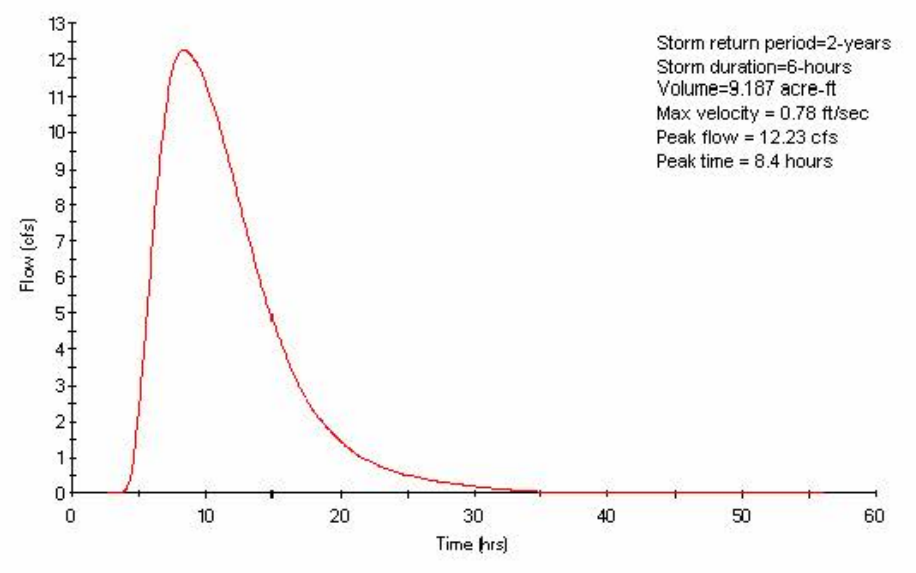
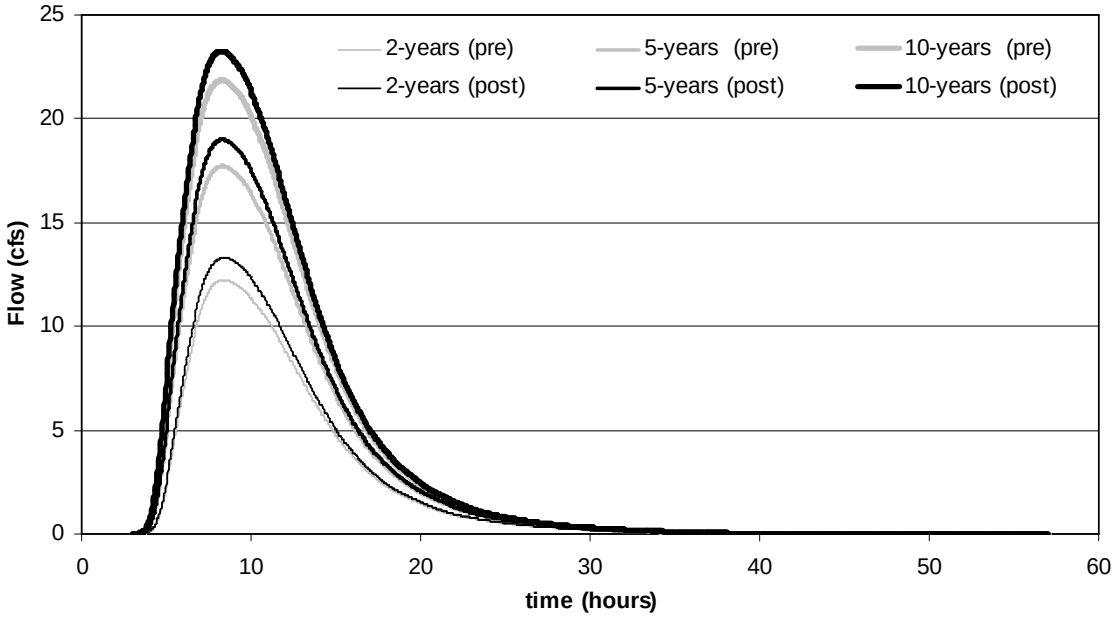


Figure B.4 – Pre-Post Construction Comparison of Most Downstream Point



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Acronyms and Abbreviations

BA	biological assessment
cfs	cubic feet per second
CN	curve number
EOS	end of system
HA	Hydrological Assessment
HSG	hydrologic soil group
IC	impervious cover
LZ	landing zone
NRCS	Natural Resource Council Services
T_c	time of concentration
the Base	Travis AFB, California

Appendix C

This appendix presents typical ranges of storm water quality found urban areas and a description of chemical used on Travis AFB runways.

C.1 URBAN STORM WATER QUALITY

Göbela, *et. al.* 2007, evaluated more than 300 references for different pollutants where they were able to compile a representative concentration matrix consisting of medians and extreme values. Concentration variations nutrients such as phosphorus compounds (P), ammonium ion (NH_4), and nitrates (NO_3), heavy metals are cadmium (Cd), zinc (Zn), copper (Cu), lead (Pb), nickel (Ni); readily soluble salts are sodium (Na), magnesium (Mg), calcium (Ca), potassium (K), sulfate (SO_4), and chloride (Cl); organic parameters are polycyclic aromatic hydrocarbons (PAH), mineral oil hydrocarbons (MOH) and derived from different surfaces are listed. The values presented are by event mean concentration (EMC).

Parameter	Unit	Rainwater		Roofs		Trafficked areas with low density		Trafficked areas with high density	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Physico-chemical parameters									
EC	µS/cm	28	223	25	269	n.a.	n.a.	108	2436
pH	–	3.9	7.5	4.7	6.8	6.4	7.9	6.4	7.9
Sum parameters									
TSS	mg/l	0.2	52	13	120	74	74	66	937
BOD5	mg/l	1	2	4	16.1	n.a.	n.a.	2	36
COD	mg/l	5	55	n.a.	n.a.	n.a.	n.a.	63	146
Nutrients									
Ptot	mg/l	0.01	0.19	0.06	0.5	n.a.	n.a.	0.23	0.34
NH4	mg/l	0.1	2	0.1	6.2	n.a.	n.a.	0.5	2.3
NO3	mg/l	0	7.4	0.1	4.7	n.a.	n.a.	0	16
Heavy metals									
Cd	µg/l	0.1	3.9	0.2	1	0.2	0.5	0.3	13
Zn	µg/l	5	235	24	4880	15	1420	120	2000
Cu	µg/l	1	355	6	3.416	21	140	97	104
Pb	µg/l	2	76	2	493	98	170	11	525
Ni	µg/l	1	14	2	7	n.a.	n.a.	4	70
Cr	µg/l	2	8	2	6	n.a.	n.a.	6	50
Main ions									
Na	mg/l	0.22	20	n.a.	n.a.	n.a.	n.a.	5	474
Mg	mg/l	0.03	0.33	n.a.	n.a.	n.a.	n.a.	1	1.4
Ca	mg/l	1.1	67.13	1	1900	n.a.	n.a.	13.7	57
K	mg/l	0.46	0.65	n.a.	n.a.	n.a.	n.a.	1.7	3.8

Parameter	Unit	Rainwater		Roofs		Trafficked areas with low density		Trafficked areas with high density	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Physico-chemical parameters									
SO4	mg/l	0.56	14.4	n.a.	n.a.	n.a.	n.a.	5.1	139
Cl	mg/l	0.2	5.2	n.a.	n.a.	n.a.	n.a.	3.9	669
Organic parameters									
PAH	µg/l	0.04	0.76	0.35	0.6	n.a.	n.a.	0.24	17.1
MOH	mg/l	0.29	0.41	0.108	3.14	n.a.	n.a.	0.51	6.5

Source: P. Göbela, C. Dierkesb, and W.G. Coldeweya, *Storm water runoff concentration matrix for urban areas*, Journal of Contaminant Hydrology, Volume 91, Issues 1-2, 1 April 2007, Pages 26-42

C.2 AIRCRAFT DEICING AND RUNWAY RUBBER REMOVAL

Aircraft Deicing

Aircraft deicing is accomplished in the aircraft parking area. The deicing solution is 20 percent glycol and 80 percent water. The aircraft is sprayed with the product, the over spray is cleaned up using a floor scrubber vehicle. This waste is transferred from the vehicle in to drums and picked up by the waste contractor (Pontemayor 2007).

Runway rubber residue and removal

Rubber accrues on runways over time from aircraft landings. This build up of rubber can reduce the friction coefficient, causing aircraft tires to slip on the runway when landing and increasing the potential for an aircraft to slide off the runway. Therefore, the rubber must be removed periodically (Speidel 2002).

Methods of removing rubber from runways include (Speidel 2002):

- High pressure water blasting. High-pressure waterblasting removes rubber by means of rotary device, which moves slowly along the surface to be cleaned, using pressures from *2,000-15,000 PSI* and up to 30 gallons of water per minute. There is a hydraulic effect of the water that actually penetrates the surface, effectively cleaning the rubber deposits as well as helping to improve the friction characteristics of the pavement surface. A sweeper picks up the rubber debris as the operation proceeds.
- Ultra high pressure water blasting. Ultra-high-pressure waterblasting also uses a rotary device which is a truck-mounted system and moves slowly along the surface to be cleaned. Pressures up to 40,000 PSI are attained and only 8 gallons of water per minute are used. With this method, there is literally a milling effect, which cleans the rubber deposits and anything else within its path, leaving a very clean, but often smoother surface.
- Chemical removal. Chemicals have been developed that are environmentally safe and effective in cleaning rubber deposits from contaminated surfaces. The chemicals are sprayed onto the surface and then scrubbed, brushed and worked into the rubber for approximately four hours or more. The chemicals break down the polymerized rubber into a soft, almost jelly-like substance that is then flushed

off the runway by waterblasting upon completion of the process. With many of the chemicals used, the debris cannot be swept up with conventional sweepers because the chemical reacts adversely with the rubber seals in the sweeper equipment. Although the chemical is not considered to be biodegradable, the debris is not. The method of clean up for the chemical removal operation is to flush off the soapy residue at the completion of the work, along with the rubber debris, onto the shoulders and into the surrounding soil. Over time the debris accumulates and may eventually cause an environmental problem requiring remediation.

- High velocity impact removal (shotblasting). This process propels abrasive particles onto the runway surface, which blasts the contaminants from the surface. The shotblaster can be adjusted to produce the desired surface texture, is environmentally clean since the entire operation is self-contained. On a non-grooved surface, it collects the abrasive particles, loose contaminants and dust from the runway surface, and then recycles the steel shot for re-use.
- Mechanical removal. This process is accomplished by either grinding or milling of the surface and collects the loose particles and dust for recycling.

As noted above, four of the five processes to remove rubber from the runway use high pressure water, shotblasting, or milling and each of these processes is environmentally friendly (i.e., uses no chemicals and collects the debris for recycling as part of the process). The other process uses chemicals. The chemicals are water-based, biodegradable, non-toxic, non-caustic, non-flammable, and non-ozone cleaners with no harmful fumes (Hi-Lite Markings, Inc 2007). However, the rubber is not environmentally friendly and it could build up in the soil along side the runway over time. The mechanical method actually removes the runway surface. When considering damage to the runway and environmental issues, the preferred method of removal would be high pressure water blasting, ultra high pressure water blasting, or high velocity impact removal (shotblasting).

Source Information:

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APPENDIX D
RESULTS OF SPECIAL STATUS INVERTEBRATE VERNAL POOL SURVEYS AT TRAVIS AFB

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11 August 2006

Marjorie Eisert
CH2M Hill
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

Subject: Results of Special–Status Vernal Pool Invertebrate Surveys at Travis Air Force Base.

Dear Ms. Eisert,

This report describes the results of special-status vernal pool invertebrate surveys conducted by EcoAnalysts, Inc. for CH2M HILL, at Travis Air Force Base in Solano County, California. Surveys were focused on special-status vernal pool crustaceans, the federally-listed delta green ground beetle, and Ricksecker's Hydrochara, an aquatic beetle of special concern. Two federally-listed vernal pool crustacean species, the vernal pool tadpole shrimp (*Lepidurus packardi*) and the vernal pool fairy shrimp (*Branchinecta lynchi*), as well as the CEQA species Ricksecker's Hydrochara (*Hydrochara rickseckeri*), were encountered during the course of this survey. No other special–status vernal pool crustaceans, nor the delta green ground beetle, were observed during these surveys. A summary of survey methods and results is provided below. Figure 1 shows the location of Travis Air Force Base, the vernal pools and seasonal wetlands are shown in Figure 2, and Figure 3 shows the location of vernal pool crustaceans and Ricksecker's Hydrochara observed during the survey.

2004-2006 Wet Season Vernal Pool Crustacean Sampling Methods. Wet-season surveys of potential vernal pool crustacean habitats within Travis Air Force Base were conducted from 29 November 2004 though 21 March 2005 and 8 January through 27 April 2006 according to United States Fish and Wildlife Service (USFWS) (1996) Interim Survey Guidelines to Permittees. All potential habitats were sampled once every fortnight using a large dip net. All portions of each habitat were sampled. Some pools dried and rehydrated during the course of the surveys, and surveys were re-commenced in these locations. Two out of four potentially occurring special–status vernal pool crustacean species were encountered during the surveys.

Stickleback, a fish commonly used in mosquito control, were introduced by unknown entities or persons into some of the potential special-status shrimp habitats. This fish species will also consume vernal pool crustaceans. As a result the wet season vernal pool crustacean surveys for those habitats where stickleback were introduced have been partially invalidated. EcoAnalysts, Inc. strongly recommends that dry season surveys be conducted in those habitats containing the fish before the next rains begin, so that the surveys in those potential habitats are not entirely invalidated.

Delta Green Ground Beetle Survey Methods. Surveys for the delta green ground beetle followed standard protocols. Surveys were conducted at all potential habitats on sunny days in February, March and April, 2005 and March and April 2006. No delta green ground beetles were observed during these surveys, however active beetles were observed on the same days at the Jepson Prairie Preserve, approximately six miles east of Travis Air Force Base.

Ricksecker's Hydrochara Survey Methods. Surveys for this species were conducted concurrently with the vernal pool crustacean surveys, and the survey methods were identical. This aquatic beetle was found in both the larval and adult stages in pools along the railroad tracks.

EcoAnalysts, Inc. will submit this report and all other pertinent materials and information to the U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (DFG), as required by the USFWS guidelines for a protocol-level survey.

If you have any questions please call me.

Sincerely,

D. Christopher Rogers
Invertebrate Ecologist and Taxonomist
EcoAnalysts, Inc.
166 Buckeye Street
Woodland, CA 95695, USA

INTRODUCTION

Travis Air Force Base (Travis AFB) is a United States Military Installation in Solano County, California, located on the east side of the City of Fairfield, and about 6 miles south of Vacaville (Figure 1). The Jepson Prairie Preserve, which supports extensive California vernal pool grassland, is located about six miles east of the base proper. Travis AFB also owns a six-mile section of the old Sacramento Northern Railroad that extends from the northeast corner of the base, east to State Highway 113, adjacent to the north entrance of the Jepson Prairie Preserve (Figure 1).

Potential special–status vernal pool invertebrate habitat includes all temporary water habitats and associated grasslands. Habitats within the project area include natural vernal pools as well as areas that were created during construction of the railroad, remediation of the base landfill, road construction, or are scrapes from land leveling projects that fit the description of a seasonal wetland.

OVERVIEW OF SURVEYS

Surveys were conducted at Travis AFB (Figure 1) for special-status vernal pool crustaceans, the delta green ground beetle, and Ricksecker's Hydrochara. Special-status vernal pool crustaceans are federally-listed fairy shrimp and tadpole shrimp species. For the purpose of this report, special-status invertebrates are defined to include invertebrate species listed as threatened or endangered under the federal Endangered Species Act (ESA) (50 CFR 17.11 for listed animals and various Federal Register notices for proposed species), or those species that meet the definition of 'rare, threatened or endangered' under the California Environmental Quality Act (CEQA).

This site is within the known range of six special-status vernal pool invertebrates: the federally threatened vernal pool fairy shrimp (*Branchinetca lynchi*) and the delta green ground beetle (*Elaphrus viridis*); the federally endangered vernal pool tadpole shrimp (*Lepidurus packardi*) and Conservancy fairy shrimp (*B. conservatio*); and federal and state species of special concern, the mid–valley fairy shrimp (*B. mesovallensis*), and Ricksecker's Hydrochara (*Hydrochara rickseckeri*). In addition, four non-listed fairy shrimp species are known from the vicinity of Travis AFB.

Stickleback, a fish commonly employed in mosquito control, were introduced by unknown entities or persons into some of the potential special-status shrimp habitats. This fish species is predatory and will readily consume vernal pool crustaceans. Therefore, the wet season vernal pool crustacean surveys for those habitats where stickleback were introduced have been partially invalidated, i.e.; we cannot say that the shrimp were not present because the stickleback may have consumed them.

METHODS

Prior to conducting surveys, EcoAnalysts, Inc. prepared a 10-day notification letter, requesting permission to conduct wet season surveys for the potential special-status vernal pool crustacean taxa at Travis AFB. The letter was submitted to Ms. Betty Warne of the Sacramento Valley Branch of the USFWS by email on 22 October 2004. Permission to conduct the surveys was granted by Ms. Betty Warne via email on the same day.

Field Methods

Aquatic Vernal Pool Invertebrates Field Methods. Wet-season surveys of potential vernal pool crustacean habitats throughout Travis AFB were conducted once every fourteen consecutive days from 29 November 2004 though 21 March 2005 and 8 January through 27 April 2006 according to USFWS (1996) Interim Survey Guidelines to Permittees. With the exception of the vernal pool habitats located at the Aeroclub and the Burke property, all potential habitats were sampled once every two weeks using a large dip net. All portions of each habitat were sampled. Ricksecker's Hydrochara were surveyed for in the same manner, however pool margins with dense vegetation were sampled more rigorously, as the larvae and adults tend to hide at the pool margins.

Vernal pools and swales judged not to pond long enough nor to be sufficiently deep enough to support special-status shrimp species were not sampled. Potential special-status shrimp habitat for the purpose of this study is defined as: seasonal wetlands of sufficient size (depth and area) that may support vegetation that indicates the potential for ponding for a sufficient duration to allow special-status shrimp species to complete their life cycles and to maintain water temperatures conducive to special-status shrimp species. All observations of vernal pool crustaceans were recorded in the field with a Global Positioning System (GPS) with sub-meter accuracy and were mapped using a Geographic Information System (GIS).

Soil samples from potential vernal pool crustacean habitats were collected on 17 July 2006 from habitats that had fish during the wet season, according to USFWS (1996) Interim Survey Guidelines to Permittees. A hand trowel was used to take approximately one liter of soil from the potential habitats, unless taking such a large quantity would have been injurious to the habitat. Each soil sample was placed in a plastic zip-lock bag, labeled with the locality number, and taken to the EcoAnalysts, Inc. California laboratory for analysis. All sampled potential habitats were identified according to the numbers assigned to them in the field, and recorded on a base map. Soil samples were prepared for examination in the laboratory by dissolving the clumps of soil in water and sieving the material through 300- and 150- µm pore size screens. The small size of these screens ensures that the eggs from the shrimp species will be retained. The portion of each sample retained in the screens was dissolved in a brine solution to separate the organic material from the inorganic material. The organic fraction was then examined under a microscope.

Delta Green Ground Beetle Field Methods. This species is endemic to the Jepson Prairie, and is found in vernal pool grasslands primarily in the vicinity of the Jepson Prairie Preserve, east towards Travis AFB, north through the California Department of Fish & Game properties that occur to the northwest of Jepson Prairie Preserve. Surveys were conducted on sunny days with little to no wind, between 6 February and 15 April 2005, and between 14 February and 20 April 2006. Surveys were conducted with concurrent monitoring of known populations at the Jepson Prairie Preserve to document the presence and activity of the Delta Green Ground Beetle. Potential Delta Green Ground Beetle habitats at both Travis AFB and the Jepson Prairie Preserve were surveyed prior to the appearance of the beetle at Jepson Prairie. When Delta Green Ground Beetle appeared at the Jepson Prairie Preserve 10 March 2005 focused surveys in all potential habitats on Travis AFB were conducted. Delta Green Ground Beetle was observed at the Jepson Prairie Preserve on 10, 18 and 24 March, and 4 April 2005 and 2, 7 and 18 April 2006. All seasonal wetlands, drainages, and their associated uplands (up to 700 foot circumference around the wetlands where ever possible) were examined throughout Travis AFB. Due to access constraints, the survey corridor around the railroad was limited to the fenced right-of-way on both sides of the railroad tracks.

Surveys were conducted by stalking and visual examination of the habitat. Appropriate habitat patches were selected, and then the surveyor crouched or sat near the patch without moving for several minutes. After 20 to 120 seconds, the beetles, if present, would resume activity after having remained still upon perceiving the surveyor's approach.

RESULTS

Vernal Pool Crustaceans

The federally-threatened vernal pool fairy shrimp (*Branchinetca lynchi*) and the federally-endangered vernal pool tadpole shrimp (*Lepidurus packardi*) were observed during the wet season surveys in seasonal aquatic habitats along the railroad tracks between the base proper and Lindsey Slough, which crosses the tracks about a mile west of Highway 113. No listed vernal pool crustacean eggs were found in any of the dry samples.

The vernal pool fairy shrimp was also found occurring in seasonal aquatic habitats along the railroad tracks on the north side of the base along Hanger Ave, just south of the hospital, and in one pool located on the north side of the runway on the east side of the base (Figure 3). The vernal pool tadpole shrimp was not found on the base proper, but was observed in several pools along the railroad tracks (Figure 3).

Per the USFWS two-year wet-season protocol requirement, results of first-year surveys are not adequate to determine absence of special-status shrimp species in those habitats where they were not encountered. To determine absence, the USFWS requires either two consecutive wet season surveys or one wet-season survey and one dry-season survey conducted within the same one-year period.

Adults and juvenile stickleback fish were found in large numbers in late April 2006 in potential habitats that had not contained fish during all previous surveys during that season. The sudden appearance of large numbers of fish indicates that they were probably introduced to the habitats artificially. Stickleback appeared in potential special-status shrimp habitats; FL 81, GA 238, GA 243 and GA 244. This fish species is a predator used in mosquito control and will readily consume vernal pool crustaceans. Therefore, the wet season vernal pool crustacean surveys for those habitats where stickleback were introduced were partially invalidated; we cannot say that the shrimp were not present because the stickleback may have consumed them. Therefore, the USFWS will not deem surveys in those pools as complete. EcoAnalysts, Inc. strongly recommends that dry season surveys be conducted in those habitats where the fish were introduced before the next rains begin, so that the surveys in those potential habitats are not entirely invalidated. The USFWS protocol survey guidelines require that wet and dry season surveys be conducted within the same one-year period.

For all other surveyed potential special-status shrimp habitats, the completed surveys should be sufficient to determine that special-status shrimp are absent from the habitats on this site, according to USFWS protocols. Concurrence from the USFWS with the findings of this report must be sought prior to initiating any actions that may impact the wetland habitats or their adjacent uplands on Travis AFB.

Delta Green Ground Beetle

No Delta Green Ground Beetles were observed in any vernal pools, ephemeral wetlands, or adjacent uplands within Travis AFB, including the railroad track extension to Highway 113, even when Delta Green Ground Beetles were active at the Jepson Prairie Preserve. It is likely that the habitats within the proposed project area do not provide all suitable habitat elements, and therefore do not support this species. However, the old Sacramento Northern Railroad corridor has its eastern terminus immediately adjacent to the designated critical habitat for this species: the terminus is directly across Highway 113 from the southwest corner of the northern portion of the designated critical habitat, and this same terminus is one half mile north of the southern portion of the designated critical habitat (Federal Register, 1980). Although the project area is not within designated critical habitat, it is advised that concurrence from the USFWS be obtained prior to implementation of any project directly adjacent to critical habitat due to the possibility of indirect impacts occurring from an action to species occurring within the critical habitat.

Ricksecker's Hydrochara

Ricksecker's Hydrochara was encountered as larvae and adults in seasonal wetlands along the old Sacramento Northern Railroad between Meridian Road and Highway 113. Three adults and numerous larvae were encountered in dense wetland margin vegetation along the tracks (Figure 3).

Appendix A. Species Accounts

Special-Status Vernal Pool Crustaceans

One special-status tadpole shrimp (*Lepidurus packardi*) and three special-status fairy shrimp species (*Branchinecta lynchi, B. conservatio* and *B. mesovallensis*) have the potential to occur at Travis AFB. In addition, four non-listed fairy shrimp species are known from the proposed project vicinity.

Lepidurus packardi Simon, 1886 is federally-listed as an endangered species. This tadpole shrimp species is found in vernal pools throughout the Sacramento Valley, and the nearest reported population is from Jepson Prairie, Solano County (Rogers, 2001). Typically *Lepidurus packardi* is green in color, but it may be mottled with brown in highly turbid water. *Lepidurus packardi* is omnivorous and generally forages on the bottoms of pools in dense vegetation. Tadpole shrimp tend to be slow growing and are usually collected after the vernal pool has been ponded for 30 days (Rogers, 2001).

Branchinecta lynchi Eng, Belk & Eriksen, 1990 is federally-listed as a threatened species. This shrimp species is found in vernal pools throughout the Central Valley and western Riverside County in California, and near Medford, Oregon (Eriksen & Belk, 1999). This fairy shrimp species occurs in neutral to slightly alkaline vernal pools throughout the California Central Valley, and in rock outcrop pools along the Interior Coast Ranges, south of the Sacramento River Delta.

Branchinecta mesovallensis Belk & Fugate, 1999 was proposed for federal endangered species status in 2002 but was rejected in 2004. This species is found in scattered localities in the eastern San Joaquin Valley, north to Sacramento County, with outlying occurrences in Solano and Contra Costa counties. This species utilizes small, short duration pools.

Branchinecta conservatio Eng, Belk & Eriksen, 1990 is federally-listed as endangered, and the taxon's type locality is Olcott Lake at Jepson Prairie Preserve, on the east side of Travis AFB. This species needs large deep vernal pools and winter lakes to complete its long life cycle. It occurs in a handful of localities in Tehama, Solano, Yolo, Merced and Ventura counties.

Branchinecta mackini Dexter, 1958 is one of the most widespread fairy shrimp west of the Rocky Mountains. This species is common in alkaline habitats with a high calcium salt content in the Great Basin, Colorado and Mojave deserts, with scattered occurrences in the San Joaquin Valley and one occurrence in southern Solano County near Bird's Landing.

Branchinecta lindahli Packard, 1883 is a common fairy shrimp with no legal status. This fairy shrimp is common in alkaline habitats throughout the western United States and northern Mexico. It typically occurs in pools that are turbid, alkaline or slightly saline, and often ringed with salt grass (*Distichilis* sp.). *Branchinecta lindahli* may be opportunistic, as it is common in a wide variety of artificial habitats, such as bulldozer scrapes, roadside ditches and railroad toe-drains (Eriksen & Belk, 1999; Rogers & Lang, in prep).

Linderiella occidentalis (Dodds, 1923) is a common fairy shrimp from vernal pools throughout the California Central Valley and Coast Ranges of California. *Linderiella occidentalis* is typically white and green with red markings. *Linderiella occidentalis* tends to mature later than the *Branchinecta* species and is typical of vernal pools that are inundated for at least 30 days. The cysts of *Linderiella occidentalis* are densely spinose, and accumulate debris, making detection of the cysts from soil samples difficult. *Linderiella occidentalis* was originally proposed for listing under the Endangered Species Act and was withdrawn from the proposal in 1995.

Artemia franciscana Kellogg, 1906 is the most widespread fairy shrimp in the world. Native to the Americas, this species has been successfully introduced to every continent except Antarctica. *A. franciscana* has no state

or federal status, and occurs only in hypersaline pools and lakes. Occurrences of this species are documented from all around San Francisco Bay and the lower Sacramento River delta region.

Typical habitat for federally listed fairy shrimp and tadpole shrimp in California include vernal pools, ponded areas within vernal swales, rock outcrop ephemeral pools, playas, alkali flats, and salt lakes (Eng et al. 1990). Other kinds of depressions that hold water of a similar volume, depth and area, and for a similar duration and seasonality as vernal pools and swales also may be potential habitat. These other depressions however, are typically artificial habitats and are unvegetated. Examples are; railroad toe-drains, road side ditches, abandoned agricultural drains, ruts left by heavy construction vehicles and depressions in fire breaks (Eng et al. 1990; Rogers & Fugate, 2001).

Pool volume is important in determining potential shrimp habitat because deeper pools with a large surface area can more easily maintain their dissolved oxygen levels. Similarly, deep pools will pond long enough to allow the shrimp to complete their life cycle.

Common wetland plant species that co-occur with the shrimp species that have potential to occur within the proposed project areas generally need the same hydrological conditions. Therefore the presence of these plant species within a potential habitat would imply a greater potential for a population of these shrimp to be present. These plants include: *Eryngium vaseyi, Downingia sp., Lasthenia sp., Eleocharis macrostachya, Psilocarphus sp., Isoetes sp., Lilaea sp., Gratiola sp.*

Similarly, pools that are dominated by vernal pool plant species that require short inundation periods will have hydrology that cannot support shrimp species. These plants include: *Hordeum marinum ssp. gussoneanum [H. hystrix], H. leporinum, Juncus bufonius, Lasthenia fremontii, Leontodon sp., Pogogyne sp., Ranunculus muricatus, Poa annua, Lolium multiflorum, Trifolium* sp.

Conversely, wetland habitats that support plant species that need water year round cannot support special-status shrimp species because the shrimp cysts must dry out before they can hatch. These plants include: *Typha sp., Salix sp., Populus sp., Lemna minor, Cyperus sp.*

Delta Green Ground Beetle

The Delta Green Ground Beetle, *Elaphrus viridis* Horn, 1878 is a federally-threatened species that is endemic to the Jepson Prairie. This species is found in vernal pool grasslands primarily in the vicinity of the Jepson Prairie Preserve, east towards Travis AFB, north through the California Department of Fish & Game properties that occur to the northwest of Jepson Prairie Preserve. It has been speculated that this species was more widely distributed (Essig Museum of Entomology, 1998), however there is no evidence that that was the case. Typical habitat for the Delta Green Ground Beetle include the margins of vernal pools, vernal swales, playas, and alkali flats, as well as the surrounding uplands, as much as 500 feet away from the wetland habitat (Federal Register, 1980; Arnold, 1983; USFWS, 1985). The Delta Green Ground Beetle prefers sparsely vegetated areas in which to hunt springtails (Collembola). This species is typically active between December and May, on calm sunny days, but may be active on days with some wind. The beetle is cryptically colored, and actively avoids potential predators by not moving until the perceived threat had passed, or flying away when the threat has come too close.

Ricksecker's Hydrochara

Ricksecker's Hydrochara, Hydrochara rickseckeri, (Horn) 1895 is considered a species of concern by the United States Fish & Wildlife Service, and meets the requirements as a "Rare, Threatened or Endangered species" under the California Environmental Quality Act. The vast majority of Hydrophilid beetles, including the Ricksecker's Hydrochara, are predatory as larvae and omnivorous as adults. Ricksecker's Hydrochara co-occurs with the fairy shrimps *Linderiella occidentalis*, *Branchinecta mesovallensis B. lynchi*, and *B. conservatio*, as well as *Lepidurus packardi* (Rogers pers. obs.). This species is entirely dependant upon the aquatic environment provided by vernal pool wetland ecosystems. Habitats supporting the Ricksecker's Hydrochara are typically in Central Valley California floristic provinces below 300 m elevation. Ricksecker's Hydrochara was originally described as endemic to the San Francisco Bay region, occurring in Alameda, Marin, San Mateo, and Sonoma Counties (Smetana 1980). Recent collections have been made in Solano County at the Jepson Prairie Preserve, and from vernal pools in Sacramento and Placer Counties (Rogers pers. obs.; CNDDB 2005).

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

IN REPLY REFER TO:
81420-2008-F-1142-1

JUN 12 2008

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

Subject: Biological Opinion for the Proposed Travis Air Force Base C-17 Assault Landing Strip Project, Solano County, California on the threatened California tiger salamander

Dear Mr. Musselwhite:

This letter is in response to your February 5, 2008 request, for initiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed Travis Air Force Base (Travis AFB) C-17 Assault Landing Strip Project. The proposed project is located in Solano County, California within the northeastern corner of the 6,883 acre Travis AFB approximately 7 miles east of Fairfield and 7 miles south of Vacaville. Travis AFB is located within the eastern border of the City of Fairfield urban limits. Your request for consultation was received in our office on February 6, 2008. This document represents the Service's biological opinion on the effects of the proposed action on the threatened California tiger salamander (*Ambystoma californiense*) (salamander). This document is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

Based upon the information provided, the Service has determined the proposed action is not likely to adversely affect on the threatened Colusa grass (*Neostapfia colusana*), endangered Solano grass (*Tuctoria mucronata*), endangered Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*), endangered Contra Costa goldfields (*Lasthenia conjugens*), endangered vernal pool tadpole shrimp (*Lepidurus packardi*), endangered Conservancy fairy shrimp (*Branchinecta conservatio*), and threatened Delta green ground beetle (*Elaphrus viridis*). The Service has made these determination based on the results of acceptable protocol surveys of suitable habitat in the action area and 250 feet from the proposed action area.

TAKE PRIDE IN AMERICA

This biological opinion is based on information provided in the following: (1) the February 5, 2008, letter from the Department of the Air Force (Air Force) requesting formal consultation for the proposed action; (2) the November 2007, *Biological Assessment for the Construction and Operation of a Permanent Southwestern United States C-17 Landing Zone at Travis Air Force Base*; (3) an April 2, 2007, meeting between representatives of the Service, the Air Force, and CH2M Hill, on the proposed action; (4) electronic mail correspondence (e-mail) and telephone conversations between representatives of the Service, the Air Force and CH2M Hill, on the proposed action; (5) references cited in this biological opinion; and (6) other information available to the Service.

CONSULTATION HISTORY

February 6, 2008: The Service received a letter and the *Biological Assessment for the Construction and Operation of a Permanent Southwestern United States C-17 Landing Zone at Travis Air Force Base*, dated November 2007; the *Preliminary Draft Environmental Assessment for the Permanent Western United States C-17 Landing Zone*, dated January 2008; and the Pre-Jurisdictional Wetlands and Waters of the U.S. Report for the Landing Zone Project, dated November 2007, from the Air Force.

April 2, 2008: The Service met with Travis AFB representative David Musselwhite and CH2M Hill to discuss the proposed project and impending future Travis AFB project consultations. The Service was informed that they would be provided with a revised project description and would work with the Service to identify appropriate compensation to minimize the project effects to the California tiger salamander.

April 7, 2008: The Service received a copy of Mark Jennings 2005 *California Tiger Salamander Habitat Assessment at Travis Air Force Base, Solano County, California* from CH2M Hill.

April 7, 2008: The Service received information from Russell Huddleston of CH2M Hill regarding his March 21, 2008, larval salamander observation on the Burke Property within Travis AFB.

April 7, 2008: The Service provided CH2M Hill with a request for additional information needed to complete consultation via an electronic mail message.

April 9, 2008: The Service provided CH2M Hill with another request for additional information needed to complete consultation via an electronic mail message.

May 1, 2008: The Service received additional project description information, including proposed avoidance measures, from David Musselwhite of Travis AFB.

May 1, 2008: The Service received additional project description information from David Musselwhite of Travis AFB.

May 8, 2008: The Service received additional project description information regarding the batch plant description and location from David Musselwhite of Travis AFB.

May 14, 2008: The Service received additional project description information regarding revised California tiger salamander effects acreages and new information about the proposed access road from CH2M Hill.

May 15, 2008: The Service received additional project description information regarding revised construction scheduling from CH2M Hill.

BIOLOGICAL OPINION

Description of Proposed Action

According to the November 2007 Biological Assessment and additional project description information provided in April and May 2008, the Air Force proposes to construct a new landing zone/runway at Travis AFB to fulfill C-17, cargo aircraft tactical arrival and landing training exercises. The proposed project would include a 9.6-acre paved runway, adjacent to an existing runway; a 6.9-acre batch plant to produce the materials needed to build the runway; and required access and staging areas. For the purposes of consultation, the Air Force divided their project into the following four components: landing zone construction, contactor staging and hauling operations, batch plant construction and operation, and utility infrastructure installment. The total action area for the proposed project is 65.4 acres. The four construction components are further described as follows.

Landing Zone Construction

The new landing zone will be constructed east and parallel to the northeastern terminus of an existing runway (Runway 03Right-21Left [03R-21L]). The entire area between the proposed and existing runway will be disturbed due to construction. The 58.5 acre landing zone construction area includes: the 9.6-acre new landing zone which includes connector taxiways at both ends of the new runway; 23.0 acres of grading activities that extend 125 to 145 feet around the new runway perimeter; and 25.9 acres of land between Runway 03R-21L and the new landing zone that will be used for staging and other ground disturbance activities. The 9.6-acre runway will be the only new hardscape associated with the Landing Zone construction component. The proposed C-17 runway will be raised and elevated 18 inches higher than the

adjacent and existing Runway 03R-21L. The new runway will be designed to prevent any accumulation of rainwater. Stormwater runoff from the proposed runway will be collected and directed towards existing drainage features on the northeastern corner of Travis AFB. These drainage features also contain runoff from Runway 03R-21L which is directed to Denverton Creek and then flows south beyond Travis AFB and on to the Wilcox Ranch.

The runway will be constructed by first preparing the current site by trucking in and compacting new soil then grading the area to meet the required elevation for the new runway and taxiways, hauling in fill material to meet elevation requirements, compacting sub grade and finally placing concrete or asphalt. The equipment that will be used includes dump trucks, graders, front end loaders, scrapers, and pavers.

Batch Plant Construction and Operation

The runway construction will require the temporary establishment of a new batch plant to manufacture Portland cement concrete and asphalt cement. The 6.9-acre batch plant would include: a collection of silos containing fly ash, lime cement; sand and gravel material storage areas; a mixing plant; above ground storage tanks containing concrete additives and water; and designated areas for sand and gravel truck unloading, concrete truck loading, and concrete truck washout. The batch plant will be located on an improved surface within the previously developed areas of Travis AFB. The plant will be located away from watercourses and in an area that minimizes the potential for storm water run-off onto sensitive areas. When selected, the location will be provided to the Service for comment prior to its construction. Runoff from the paved and unpaved portions of the batch plant will be directed into a lined washout area, constructed catchment pond, or tanks. It is anticipated that the batch plant location will be selected no later than 30 days prior to the start of construction. Travis AFB will continue to use the batch plant for other projects, such as the planned resurfacing of Runway 03R-21L. The batch plant is designed as a temporary facility and will eventually be dismantled and removed from the selected location. Operation will require a National Pollution Discharge Elimination System (NPDES) permit as well as the implementation of Best Management Practices (BMP) and a Storm Water Pollution Prevention Plan (SWPPP) that will include a Sampling and Analysis Plan (SAP).

Staging and Hauling Operations

The existing Perimeter Road will be used as the contractor haul and access route. Perimeter Road follows the Travis AFB eastern boundary fence and parallels the existing flight line. Construction personnel would access the road at the Travis AFB South Entrance/Suisan Gate and follow Perimeter Road approximately 4.4 miles to where it would access the construction site via a new temporary access road. The temporary access will require a new approximately 317.7-foot long and 15 foot wide, 0.11-acre access spur from Perimeter Road to the southwest corner of the proposed C-17 runway construction site. The Air Force plans to construct this road to the existing topography, allowing surface flows to overtop the road. The road will be established with blading and compaction. The road surface will likely be topped with gravel. The road bed will not be raised and no fill will be used in its construction. The Air Force plans

to restore the road following construction and within one year from the start of construction. Material generated at the batch plant will be hauled to the construction area on existing paved roads within the base. All other equipment and storage and staging will be done within the Assault Landing Zone (ALZ) construction area.

Utility Infrastructure Construction

Installation of the electrical systems including the runway lights and other utilities for the proposed C-17 landing zone will be limited to the proposed and previously defined C-17 landing zone. To supply electricity to the landing zone, new electrical cable will be pulled through an existing duct bank that runs along the south side of Runway 03R-21L. No overhead lighting will be installed.

Scheduling

The Air Force estimates that construction would begin in March 2009 and recurring aircraft operations would begin after runway construction is completed. Construction, including restoration activities, is expected to be completed in one year or less. While not anticipated, night work may occur if necessary.

Conservation and Minimization Measures

According to a May 1, 2008 electronic mail message, the Air Force proposed that this action will be designed and constructed in the following ways that will minimize both direct and indirect effects on the California tiger salamander. These measures are:

1. To minimize the adverse effects of the proposed project on the California tiger salamander the Air Force will protect a combined total of 105.3 acres of upland. This habitat compensation can be achieved by: 1) purchase of compensation credits at an existing Service approved bank or banks, as appropriate for the species in Solano County, 2) or purchase and preservation of a Service approved parcel and establishment of a conservation easement, development of a management plan, and provision of a perpetual endowment sufficient to cover management and maintenance of protected lands for the benefit and recovery of California tiger salamander), or 3) a combination of these two approaches. The project proponents will also restore 23.0 acres of disturbed upland within one year from the start of construction for tiger salamander upland dispersal habitat. Temporarily disturbed areas that are not restored within one year of construction will be considered permanently impacted by the Service.

2. The Resident Officer In Charge of Construction or their designee will be responsible for implementing the conservation measures and Terms and Conditions of the biological opinion and shall be the point of contact for the project. The Resident Officer In Charge of Construction or their designee will maintain a copy of the biological opinion onsite whenever construction is taking place. Their name and telephone number will be provided to the Service at least thirty (30) calendar days prior to groundbreaking at the

project. Prior to ground breaking, the Resident Officer In Charge of Construction will submit a letter to the Service verifying that they posses a copy of the biological opinion and have read its Terms and Conditions.

3. A Service-approved biologist will be designated for the project. This qualified biologist(s) will be on-site during all activities that may result in the take of the California tiger salamander. The qualifications of the biologist(s) will be presented to the Service for review and written approval prior to ground-breaking at the project site. The biologist(s) will oversee implementation of all the conservation and minimization measures and Terms and Conditions in the biological opinion. They shall have the authority to stop project activities, through communication with the Resident Engineer or their designee, if any of the requirements are not being fulfilled. If the biologist(s) exercises this authority, the Service and the California Department of Fish and Game will be notified by telephone and electronic mail within one working day. The Service contact will be Peter Cross, Deputy Field Supervisor, Endangered Species Division at the Sacramento Fish and Wildlife Office at telephone (916) 414-6600.

4. The Resident Officer In Charge of Construction will halt work and immediately contact the Service-approved, project biologist and the Service in the event that a California tiger salamander gains access to a construction zone. The Resident Officer In Charge of Construction will suspend all construction activities in the immediate construction zone until the animal leaves the site voluntarily or is removed by the biologist to a release site using Service-approved transportation techniques.

5. All construction personnel will attend an environmental education program delivered by the Service-approved biologist prior to working on the project site. The program will focus on how best to avoid take of California tiger salamander. The training session would be scheduled as a mandatory informational field meeting by the Resident Officer In Charge of Construction for contractors and all construction personnel, and appropriate staff. The field meeting will include topics on species identification, life history, descriptions, and habitat requirements during various life stages. Emphasis will be placed on the importance of the habitat and life stage requirements within the context of the project area maps showing areas where minimization and avoidance measures are being implemented will be included as part of this education program. The program will include an explanation of appropriate federal and state laws protecting endangered species as well as the importance of compliance with various resource agency conditions.

6. To minimize temporary disturbances, all project-related vehicle traffic will be restricted to established roads, construction areas, and other designated areas. These areas also will be included in pre-construction surveys and, to the maximum extent possible, will be established in locations disturbed by previous activities to prevent further adverse effects. Project-related vehicles will observe a 20-mile per hour speed limit within construction areas, except on local streets and state highways; this is particularly

important at night when the California tiger salamander is most active. To the maximum extent possible, night-time construction will be minimized. Off-road traffic outside of designated project areas will be prohibited.

7. Project employees will be provided with written guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.

8. To minimize attraction to predators all food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed at least once a day from the entire project site.

9. To avoid injury or death of the California tiger salamander, no firearms will be allowed on the project site except for those carried by authorized security personnel, or local, State, or Federal law enforcement officials.

10. To prevent harassment, injury or mortality of California tiger salamander or destruction of their burrows by dogs or cats, no canine or feline pets will be permitted in the action area.

11. The Air Force will install exclusion fencing for the California tiger salamander around any work area if necessary to continue construction activities outside the working window of April 16 to October 14. Exclusionary fencing will consist of taut silt fabric; 24 inches in height, staked at 10-foot intervals, with the bottom buried 6 inches below grade. Exclusion fencing will be maintained so that it is intact during rain events and 24 hours after any rain event, and will be routinely checked for integrity or potential entrapment.

12. The construction area will be delineated with high visibility temporary fencing at least four feet in height, flagging, or other barrier to prevent encroachment of construction personnel and equipment onto any sensitive areas during project work activities. Such fencing will be inspected and maintained daily by the on-site biologist until completion of the project. The fencing will be removed only when all construction equipment is removed from the site. Actions within the project area will be limited to vehicle and equipment operation on existing roads. No project activities will occur outside the delineated project construction area.

13. If requested, before, during, or upon completion of ground breaking and construction activities, the Air Force will allow access by Service and/or California Department of Fish and Game personnel to the project site to inspect project effects to the California tiger salamander and their habitats.

14. No more than thirty (30) calendar days prior to any ground disturbance, pre-construction surveys will be conducted by a Service-approved biologist for the California tiger salamander. These surveys will consist of walking surveys of the project limits and

adjacent areas to determine presence of the species. Biologist will investigate all potential California tiger salamander cover sites. This includes full investigation of mammal burrows.

15. A biologist will be onsite to monitor the initial ground disturbance activities. The biologist will perform a clearance survey immediately prior to the initial ground disturbance. The biological monitor will also investigate areas of disturbed soil for signs of listed species within 30 minutes following the initial disturbance of that given area.

16. The Air Force will prepare a relocation plan for moving California tiger salamanders and submit it for Service approval at least 60 working days prior to the date of initial ground breaking. All California tiger salamanders encountered in the action area will be relocated to a Service-approved location. The relocation site will be approved prior to California tiger salamanders preconstruction surveys.

17. Only Service-approved biologist(s) who are familiar with the biology and ecology of the California tiger salamander will capture or handle this species. Service-approved biologists will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two hours before and during periods when they are capturing and relocating tiger salamanders. To avoid transferring disease or pathogens between aquatic habitats during the course of surveys or handling of salamanders, Service-approved biologists will follow the Declining Amphibian Populations Task Force's "Code of Practice." Service-approved biologists will limit the duration of handling and captivity of tiger salamanders. While in captivity, individuals will be kept in a cool, moist, aerated environment, such as a bucket containing a damp sponge. Containers used for holding or transporting adults will not contain any standing water.

18. Biologist will take precautions to prevent introduction of amphibian diseases to the action area by disinfecting equipment and clothing as directed in the October 2003 California tiger salamander survey protocol titled, *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* and the recommended equipment decontamination procedures within the Service's California Red-Legged Frog Survey Guidance. Both items are available at the Service's Sacramento office website (http://www.fws.gov/sacramento/es/protocol.htm). Disinfecting equipment and clothing is especially important when biologists are coming to the action area to handle salamanders after working in other aquatic habitats.

19. To prevent inadvertent entrapment of California tiger salamanders during construction, all excavated, steep-walled holes or trenches more than 2 feet deep will be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they must be thoroughly inspected for trapped animals. If at any time

a trapped listed animal is discovered, the on-site biologist will immediately place escape ramps or other appropriate structures to allow the animal to escape, or the Service and/or California Department of Fish and Game will be contacted by telephone for guidance. The Service will be notified of the incident by telephone and electronic mail within one working day.

20. Plastic mono-filament netting (erosion control matting) or similar material will not be used at the project site because the California tiger salamander may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

21. Upon completion of the proposed action, all California tiger salamander habitat subject to temporary ground disturbances, along the C-17 landing zone perimeter and the access spur will be regraded, if appropriate, and revegetated with seeds and/or cuttings of appropriate plant species to promote restoration of the area to pre-project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the project, but that after project completion will not be subject to further disturbance and has the potential to be revegetated. The Air Force will submit to the Service their draft proposal for the restoration and revegetation plan at least sixty (60) calendar days prior to initial ground breaking; the final plan will be submitted for approval by the Service prior to ground breaking at the proposed project. To the maximum extent practicable (i.e., presence of natural lands), topsoil will be removed, cached, and returned to the site according to successful restoration protocols. Loss of soil from run-off or erosion will be prevented with straw bales, straw wattles, or similar means provided they do not entangle or block salamander escape or dispersal routes. The draft and final plan will contain specific quantifiable criteria to evaluate the success of the restoration. A biologist will ensure that areas subject to temporary disturbance have been adequately restored.

22. Injured California tiger salamanders will be cared for by a licensed veterinarian or other qualified person such as the on-site biologist; dead individuals will be preserved according to standard museum techniques and held in a secure location. The Service and the California Department of Fish and Game will be notified within one (1) working day of the discovery of death or injury to a California tiger salamander that occurs due to project related activities or is observed at the project site. Notification will include the date, time, and location of the incident or of the finding of a dead or injured animal clearly indicated on a USGS 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information. The Service contacts are Peter Cross, Deputy Assistance Field Supervisor, Endangered Species Program at the Sacramento Fish and Wildlife Office (916/414-6600), and the Resident Agent-in-Charge of the Service's Law Enforcement Division at 916/414-6660.

23. The Air Force will submit a post-construction compliance report prepared by the on-site biologist to the Sacramento Fish and Wildlife Office within sixty calendar days following project completion or within sixty calendar days of any break in construction

activity lasting more than sixty calendar days. This report will detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting compensation and other conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the California tiger salamander, if any; (v) occurrences of incidental take; (vi) documentation of employee environmental education; and (vii) other pertinent information. The reports will be addressed to the Deputy Assistant Field Supervisor of the Endangered Species Program, Sacramento Fish and Wildlife Office.

24. The Air Force will prepare and implement an erosion control and restoration plan to control short-term and long-term erosion and sedimentation effects and to restore soils and vegetation in areas affected by construction activities. The plan will include all the necessary local jurisdiction requirements regarding erosion control and will implement BMPs for erosion and sediment control as required. Only appropriate native plant material will be used for erosion control and restoration.

25. The Air Force will submit to the Regional Water Quality Control Board (RWQCB) a notice of intent to discharge stormwater before construction and/or operation activities begin and will develop and implement a Storm Water Pollution Prevention Plan as required by the conditions of a NPDES permit. The Air Force will prepare a SWPPP that identifies BMP's for discharges and groundwater disposal from dewatering operations associated with construction. The SWPPP will identify how and where these discharges would be disposed of during construction and operations. The SWPPP will include provisions for the following:

    a. Construction activities will be limited, such as to minimize the area of ground disturbance. No disturbance will be allowed outside the limits of applicable permits. Preservation of existing vegetation will be provided to the maximum extent possible. To minimize effects to California tiger salamander habitat, all required BMP's will be in place during the construction. Sensitive areas will be marked with high visibility fencing to clearly identify the construction area relative to sensitive areas.

    b. Installation of temporary erosion control devices will be an integral part of construction. Sedimentation fences will be used to contain polluted or turbid run-off from the work site. Other methods of temporary erosion control, including but not limited to hay bail check dams, will be employed to protect drainages, ephemeral pools, and all other areas susceptible to damage from run-off. Erosion control devices will be installed concurrently with construction earthwork.

    c. Excess materials from excavation activities will be hauled and disposed of at a permitted site. The disturbed right-of-way will be reseeded with the appropriate seed mixture. Spoils materials will not be placed in sensitive habitat areas, such as wetlands.

d. Dedicated fueling areas and refueling practices will be designated. If possible, dedicated refueling areas will be located at least 200-feet from a drainage or wetland. Dedicated fueling areas will be protected from storm water run-on and run-off, and will be located at least 50 feet from downstream drainage facilities. Fueling will be performed on level-grade areas. On site fueling will only be used where it is impractical to send vehicles and equipment off site for fueling. When fueling must occur onsite, the contractor will designate an area to be used subject to approval of the Resident Officer In Charge of Construction. Drip pans or absorbent pads will be used during on-site vehicle and equipment fueling.

e. All equipment will be maintained such that there will be no leaks of fluids such as gasoline, oils, or solvents.

f. Spill control BMP's will be implemented anytime chemicals and/or hazardous substances are stored or used on the projects. Employees will be educated in proper material handling, spill prevention, and clean-up. Clean-up materials will be on-site and located near material storage and use.

g. The temporary stockpiling of all materials will be located a minimum of 50 feet away from concentrated flows of storm water, drainage courses, and inlets. Stockpiles of "cold mix" asphalt materials will be placed on and covered with plastic or comparable material prior to the onset of precipitation. All other stockpiles will be covered, protected with soil stabilization measures, and a temporary perimeter sediment barrier, prior to the onset of precipitation.

h. Erosion control devices will be monitored on a regular basis and augmented as necessary. In the event of pending storms, and in compliance with the SWPPP, erosion control devices will be inspected to ensure that such devices are in place and are functional. Monitoring and maintenance of erosion control devices and adjacent disturbed areas will continue during and immediately after significant storm events.

26. Initiation of the construction is anticipated within 1 year from the date of issuance of the biological opinion. Because of the potential for significant changes to the California tiger salamander species baseline before the completion of construction, the Air Force will reinitiate formal consultation if construction of the C-17 landing zone has not been completed within 3 calendar years from the date of issuance of the biological opinion.

Action Area

The action area is defined in 50 CFR § 402.02 as, "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the Travis AFB C-17 Assault Landing Strip Project, this includes all areas subject to the direct effects associated with construction (the landing zone, batch plant, and new access spur road necessary during the construction phase), as well as the indirect effects on and off Travis AFB associated with hydrological modifications.

California Tiger Salamander Status and Environmental Baseline

The final rule listing the California tiger salamander as a threatened species was published on August 4, 2004 (Service 2004). The California tiger salamander is endemic to California and historically inhabited the low-elevation grassland and oak savanna plant communities of the Central Valley, adjacent foothills, and inner coast ranges (Jennings and Hayes 1994; Storer 1925; Shaffer *et al.* 1993). The species has been recorded from near sea level to approximately 3,900 feet in the coast ranges and to approximately 1,600 feet in the Sierra Nevada foothills (Shaffer *et al.* 2004). Along the coast ranges, the species occurred from the Santa Rosa area of Sonoma County, south to the vicinity of Buellton in Santa Barbara County. The historic distribution in the Central Valley and surrounding foothills included northern Yolo County southward to northwestern Kern County and northern Tulare County. Three distinct California tiger salamander populations are recognized and correspond to Santa Maria area within Santa Barbara County, the Santa Rosa Plain in Sonoma County, and vernal pool/grassland habitats in the southern Sacramento Valley, the San Joaquin Valley and associated areas in the foothills of the Sierra Nevada, and the San Francisco Bay area. south into San Luis Obispo County.

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

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

Tiger salamanders may also use landscape features such as leaf litter or desiccation cracks in the soil for upland refugia. Burrows often harbor camel crickets (*Stenelopomatus* species) and other invertebrates that provide likely prey for the amphibians. Underground refugia also provide protection from the sun and wind associated with the dry California climate that can cause excessive drying of amphibian skin. Although tiger salamanders are members of a family of "burrowing" salamanders, they are not known to create their own burrows. This may be due to the hardness of soils in the California ecosystems in which they are found. Tiger

salamanders depend on persistent small mammal activity to create, maintain, and sustain sufficient underground refugia for the species. Burrows are short lived without continued small mammal activity and typically collapse within approximately 18 months (Loredo *et al.* 1996).

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

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

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

California tiger salamander larvae typically hatch within 10 to 24 days after eggs are laid (Storer 1925). The peak emergence of these metamorphs is typically between mid-June and mid-July (Loredo and Van Vuren 1996; Trenham *et al.* 2000). The larvae are totally aquatic and range in length from approximately 0.45 to 0.56 inches (Petranka 1998). They have yellowish gray bodies, broad fat heads, large, feathery external gills, and broad dorsal fins that extend well up their back. The larvae feed on zooplankton, small crustaceans, and aquatic insects for about six weeks after hatching, after which they switch to larger prey

(J. Anderson 1968). Larger larvae have been known to consume the tadpoles of Pacific treefrogs (*Pseudacris regilla*), western spadefoot toads (*Spea hammondii*), and California red-legged frogs (*Rana aurora draytonii*) (J. Anderson 1968; P. Anderson 1968). Tiger salamander larvae are among the top aquatic predators in seasonal pool ecosystems. When not feeding, they often rest on the bottom in shallow water but are also found throughout the water column in deeper water. Young salamanders are wary and typically escape into vegetation at the bottom of the pool when approached by potential predators (Storer 1925).

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

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

Lifetime reproductive success for the California tiger salamander is low. Results from one study suggest that the average female bred 1.4 times over their lifespan and produced 8.5 young per reproductive effort that survived to metamorphosis (Trenham *et al.* 2000). This resulted in the output of roughly 11 metamorphic offspring over a breeding female's lifetime. The primary reason for low reproductive success may be that this relatively short-lived species requires two or more years to become sexually mature (Shaffer *et al.* 1993). Some individuals may not breed until they are four to six years old. While California tiger salamanders may survive for more than ten years, many breed only once, and in one study, less than 5 percent of marked juveniles survived to become breeding adults (Trenham 1998b). With such low recruitment, isolated populations are susceptible to unusual, randomly occurring natural events as well human-caused factors that reduce breeding success and individual survival. Factors that repeatedly lower breeding success in isolated pools can quickly extirpate a population.

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

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

Although previously cited information indicates that tiger salamanders can travel long distances, they typically remain close to their associated breeding ponds. A trapping study conducted in Solano County during the winter of 2002/2003 suggested that juveniles dispersed and used upland habitats further from breeding ponds than adults (Trenham and Shaffer 2005). More juvenile salamanders were captured at traps placed at 328, 656, and 1,312 feet from a breeding pond than at 164 feet. Approximately 20 percent of the captured juveniles were found at least 1,312 feet from the nearest breeding pond. The associated distribution curve suggested that 95 percent of juvenile salamanders were within 2,099 feet of the pond, with the remaining 5 percent being found at even greater distances. Preliminary results from the 2003-04 trapping

efforts at the same study site detected juvenile tiger salamanders at even further distances, with a large proportion of the captures at 2,297 feet from the breeding pond (Trenham *et al.*, unpublished data). Surprisingly, most juveniles captured, even those at 2,100 feet, were still moving away from ponds (Ben Fitzpatrick, University of California at Davis, personal communication, 2004). In Santa Barbara County, juvenile California tiger salamanders have been trapped approximately 1,200 feet away while dispersing from their natal pond (Science Applications International Corporation, unpublished data). These data show that many tiger salamanders travel far while still in the juvenile stage. Post-breeding movements away from breeding ponds by adults appear to be much smaller. During post-breeding emigration from aquatic habitat, radio-equipped adult tiger salamanders were tracked to burrows between 62 to 813 feet from their breeding ponds (Trenham 2001). These reduced movements may be due to adult tiger salamanders exiting the ponds with depleted physical reserves, or drier weather conditions typically associated with the post-breeding upland migration period.

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

Documented or potential tiger salamanders predators include coyotes (*Canis latrans*), raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), opossums (*Didelphis virginiana*), egrets (*Egretta* species), great blue herons (*Ardea herodias*), crows (*Corvus brachyrhynchos*), ravens (*Corvus corax*), garter snakes (*Thamnophis* species), bullfrogs (*Rana catesbeiana*), California red-legged frogs (*Rana aurora draytonii*), mosquito fish (*Gambusia affinis*), and crayfish (*Procrambus* species). Domestic dogs (*Canis familiaris*) have been observed eating California tiger salamanders at Lake Lagunitas at Stanford University (Sean Barry, ENTRIX, personal communication to C. Nagano, July 2004).

The California tiger salamander is imperiled throughout its range due to a variety of human activities (Service 2004). Current factors associated with declining tiger salamander populations include continued habitat loss and degradation due to agriculture and urbanization; hybridization with the non-native eastern tiger salamander (*Ambystoma tigrinum*) (Fitzpatrick and Shaffer 2004; Riley *et al.* 2003); and predation by introduced species. Tiger salamander populations are likely threatened by multiple factors but continued habitat fragmentation and colonization of non-native salamanders may represent the most significant current threats. Habitat isolation and fragmentation within many watersheds have precluded dispersal between sub-populations and jeopardized the viability of metapopulations (broadly defined as multiple subpopulations that occasionally exchange individuals through dispersal, and are capable of colonizing or "rescuing" extinct habitat patches). Other threats include predation and

competition from introduced exotic species; possible commercial over-utilization; diseases; various chemical contaminants; road kill; and certain unrestrictive mosquito and rodent control operations. Currently, these various primary and secondary threats are largely not being offset by existing Federal, State, or local regulatory mechanisms. The tiger salamander is also prone to chance environmental or demographic events, to which small populations are particularly vulnerable.

Travis AFB is located within the Solano-Colusa vernal pool region and the Greater Jepson Prairie Ecosystem, which is a geographical area, defined by landscape and hydrological features that support a complex of vernal pools and a variety of associated endemic and special-status plant and animal species. The California tiger salamander is one of the primary species in the ecology of this vernal pool region. This listed amphibian has been adversely affected by development and modification of the vernal pool, grassland, and open woodland habitat within the Solano-Colusa vernal pool region. Construction of and around Travis AFB contributed to local California tiger salamander habitat loss and fragmentation. The California tiger salamander is known to be present in much of the undeveloped areas surrounding the base. The California Department of Fish and Game's California Natural Diversity Database includes one reported California tiger salamander observation within 1.3 miles east of the C-17 runway action area (CDFG 2008) and the Biological Assessment references seven California tiger salamander observed on the adjacent Wilcox Ranch and Muzzy Ranch properties with at least one observation within 0.25 miles of the action area (Air Force 2007). The action area is within the known California tiger salamander dispersal range from these salamander-occupied properties and there are no significant artificial, hydrological, or landscape barriers between these occupied areas and the action area. The base boundary is defined by a tall chain link security fence that is not effective in preventing salamander movement on or off the base.

Areas immediately adjacent to the action area and the eastern boundary of Travis AFB have been assigned various designations relative to the ecological value of associated vernal pool habitat. The action area is immediately adjacent to the Jepson Prairie Core area described in the Service's Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (Service 2005). The California tiger salamander Central Valley Region, Designated Critical Habitat Unit 2 is located approximately 2 miles east of the action area. There is continuous habitat connectivity between the action area and this critical habitat unit. There is small mammal activity in the action area that results in potential tiger salamander underground refugia. According to the Air Force there is no small mammal control program being implemented in or adjacent to the action area.

California tiger salamander protocol level surveys have never been conducted on Travis AFB but herpetologist, Mark Jennings, did conduct a salamander habitat assessment of the base in 2005 (Jennings 2005). Jennings considered pond FL081, which is partially located within the action area, as having a moderate potential to support successful California tiger salamander breeding due to water depth and the presence of Pacific treefrog larvae. Although not considered an effective salamander sampling technique, no adult or larval salamanders were incidentally observed or captured in FL081 during 2004 to 2006 protocol wet season vernal pool crustacean sampling (Air Force 2007). Salamander detection may have been influenced by

the presence of stickleback (*Gasterosteus aculeatus*) that were found in the pond during 2006 vernal pool crustacean surveys, but not in previous sampling of FL081. FL081 has not been adequately surveyed for salamanders and remains a potential breeding pond. Jennings also identified other vernal pools on the northwest (opposite) side of Runway 03R-21L approximately 1.0 to 0.5 miles from the action area as having a moderate potential to provide salamander breeding habitat (Jennings 2005).

CH2M Hill biologist, Russell Huddleston, incidentally captured California tiger salamander larvae while conducting vernal pool crustacean sampling at a pond (basin BP35a) near base housing at the north central boundary of Travis AFB, approximately 2.2 miles west of the action area (Service personal communication with Russell Huddleston on April 7, 2008). Mr. Huddleston captured the larvae while sampling vernal pools in the general area as part of the monitoring requirements for the Burke Property vernal pool mitigation site. Huddleston informed the Service and Dr. Brad Shaffer from the University of California at Davis, and on April 3, 2008, Shaffer and his associates visited the Burke Property vernal pool mitigation site on Travis AFB to sample BP35a and two other nearby ponds for tiger salamanders. According to Huddleston, Schaffer captured over 60 California tiger salamander larvae between two of the pools and took tissue samples from 20 individuals at each pool for genetic analysis. (These ponds were not considered to provide potential salamander breeding habitat by Jennings but nearby constructed vernal pools were [Jennings 2005]). Base development presents a significant movement barrier between the occupied pools at the Burke Property vernal pool mitigation site and the action area. However, the significance of this capture is that it was the first time the listed amphibian has been identified on Travis AFB. This is more likely a result of a lack of survey data rather than the potential of the species to be present in appropriate habitat throughout the base.

The Service believes that the California tiger salamander is reasonably certain to occur within the action area because of the presence of appropriate upland habitat within the action area, the presence of a potential breeding pond within the action area, known nearby occurrences within the dispersal range of the salamander, uninterrupted connectivity between occupied habitat and that action area, and the biology and ecology of the animal, especially the ability of the adults to move considerable distances between its breeding ponds and upland habitat.

Effects of the Proposed Action

The proposed project is likely to result in a number of adverse effects to the California tiger salamander. The proposed project will eliminate salamander habitat and likely cause direct mortality, injury, or harassment of individual juveniles and adults. Implementation of the proposed action would result in the permanent loss of 35.1 acres of upland habitat due to: grading and paving of the 9.6 acre runway and connector taxiways; staging and maintenance activities within the 25.3 acres between Runway 03R-21L and the proposed C-17 runway; use of Perimeter Road for access; and construction and use of a 0.11 acre access spur from Perimeter Road to the C-17 runway construction area. Implementation of the proposed action would result in the temporary loss of 23.0 acres of upland habitat due to grading activities on the proposed 23.0 acre C-17 runway perimeter. In terms of wetlands, the areas of effects

include the permanent loss of 0.18 acres of vernal pool habitat and 0.24 acres of seasonal wetlands, as well as the temporary loss of 0.64 acres of seasonal wetlands and the rerouting of a 0.45 acre drainage ditch. Discharge of additional stormwater and materials associated with construction, equipment fluids, and runway maintenance could indirectly adversely affect salamanders on and off Travis AFB by compromising downstream water quality. The proposed project would result in the permanent loss of 35.1 acres and the temporary loss of approximately 23.0 acres of suitable upland habitat of the California tiger salamander. No permanent or seasonal wetlands or ponds appropriate for the listed amphibian breeding would be directly lost from implementation of the proposed action.

Mortality, injury, or harassment of the California tiger salamander could occur from being crushed by project related equipment or vehicles, construction debris, and worker foot traffic within the action area. Individuals of this listed species also could fall into trenches, pits, or other excavations, and be directly killed, or unable to escape, be killed due to desiccation, entombment, or starvation. Work activities, including vibration, may cause tiger salamanders to leave the work site and surrounding areas. This disturbance and displacement may increase the potential for predation, desiccation, competition for food and shelter, or strike by vehicles on the runway, Perimeter Road, and the access spur.

The construction activities at the proposed project could result in the introduction of chemical contaminants to the site. Substances used in runway building materials could leach out or wash out of the soil into adjacent habitat. Vehicles may leak hazardous substances such as motor oil and antifreeze. A variety of substances could be introduced during accidental spills of materials. Such spills can result from leaks in vehicles, 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. California tiger salamanders using these areas could be exposed to any contaminants that are present at the site. Exposure pathways could include inhalation, dermal contact, direct ingestion, or ingestion of contaminated soil or plants. Exposure to contaminants could cause chronic or acute effects possibly reducing health and/or productivity or mortality. Carcinogenic substances could cause genetic damage resulting in sterility, reduced productivity, or reduced fitness among progeny. Little information is available on the effects of contaminants on the California tiger salamander. The effects may be difficult to detect. Morbidity or mortality likely would occur after the animals had left the contaminated site, and more subtle effects such as genetic damage could only be detected through intensive study and monitoring.

Various conservation measures such as minimizing the total area disturbed by project activities, and properly constructing exclusionary fencing may reduce mortality, injury, or harassment. Preconstruction surveys and the relocation of individual tiger salamanders may reduce injury or mortality. However, the capturing and handling of tiger salamanders to remove them from a work area may result in the harassment, mortality or injury of individuals. Stress, injury, and mortality may occur as a result of improper handling, containment, and transport of individuals. Death and injury of individual tiger salamanders could occur at the time of capture, relocation or subsequent to their release. Although survivorship for translocated tiger salamanders has not been estimated, survivorship of translocated wildlife, in general, is lower because of

intraspecific competition, lack of familiarity with the location of potential breeding, feeding, and sheltering habitats, and increased risk of predation. Improper handling, containment, or transport of individuals would be reduced or prevented by use of a Service-approved biologist, by limiting the duration of handling, and requiring the proper transport of these species.

Because these animals are nocturnal, lighting installed for C-17 training activities and/or lighting used for possible night time construction likely would increase all of the above effects. Wise and Buchanan (2006) reviewed the adverse effects that may result from night time illumination on salamander species. Artificial lighting used during night time construction may increase predation of the California tiger salamanders, if it occurs during periods of fall, winter, or spring rains, because the amphibians will lose the cover of darkness for movement. Nocturnal foraging by salamander species may be affected by artificial lighting. Wise and Buchanan (2006) reported that in one species of salamander, individuals emerged from refugia to forage within one hour after light levels dropped to dramatically following sunset. During such foraging bouts, visual information was used for locating prey. Greater light levels delay emergence, resulting in less foraging time, but could have increased the ability of the salamanders to capture prey; however, they also could make the amphibians more vulnerable to predation. Many salamanders, such as the California tiger salamander, are terrestrial as adults but migrate to ponds to breed and lay eggs. The orientation of some of these terrestrial species away from and toward these ponds is influenced by the spectral characteristics of light (Wise and Buchanan 2006). Artificial lights that emit unusual spectra may disrupt these migration patterns.

California tiger salamander mortality and injury occurs when the animals attempt to cross roads and are hit by cars, trucks, or motorcycles. The same threat will likely occur with the proposed C-17 training activities. The majority of strikes would likely occur on rainy nights when the animals are moving to their breeding ponds. Thus, strikes would be a direct source of mortality for the California tiger salamander. If strikes are sufficiently frequent in a given locality, this could result in reduced abundance of this animal. Especially problematic is the death of females prior to the laying of their eggs because this could result in the loss of an entire cohort, and therefore, reduced recruitment of new individuals into the population.

The Biological Assessment included hydrological modeling to estimate the action's potential indirect effects to salamander habitat on and off Travis AFB. The action area's baseline and post-construction hydrology directs stormwater towards the northwest corner of the base where it is discharged into Denverton Creek. From the outfall, Denverton Creek flows due south through the Muzzy Ranch and Wilcox Ranch and eventually has hydrological connectivity with Suisun and Grizzly Bays. According to the Biological Assessment, the completed project will likely increase discharge, flow velocity, and flow volume into Denverton Creek which may increase the contribution of pollutants associated with runway operations. According to the Air Force, the pollutants of concern include chemicals used in de-icing operations in the aircraft parking areas on the west side of the airfield and the clean up of accumulated rubber on the new runway (Air Force 2007). The de-icing solution is 20 percent ethylene glycol and 80 percent water and is sprayed on the aircraft in the aircraft parking area, away from storm drains, and not on the runway. According to the Biological Assessment, overspray is cleaned up using a floor

scrubber vehicle and the waste is transferred to drums that are processed by a waste contractor, thus minimizing the potential for ethylene glycol to enter the action area, Denverton Creek, and downstream California tiger salamander habitat.

According to the Biological Assessment, the buildup of aircraft tire rubber on the proposed runway can constitute the accumulation of a pollutant and an aircraft safety hazard. The Air Force provided five different methods of rubber removal and states that any of the methods is environmentally preferable to allowing the rubber to accumulate and potentially migrate off the runway (Air Force 2007). Four of the five methods involve mechanical removal by high pressure water, high velocity impact removal (shot blasting), or milling. The other method uses water-based chemical cleaners that are biodegradable, non-toxic, non-caustic, non-flammable, non-ozone emitting, and have no harmful fumes. According to the Air Force, high pressure water blasting, ultra high pressure water blasting, or shot blasting are their preferred methods of rubber removal. These methods are used for maintenance on the adjacent Runway 03R-21L. Therefore, according to the Air Force, de-icing and rubber removal activities are not likely to affect downstream water quality or California tiger salamanders and their habitat on or off Travis AFB.

The addition of hardscape will likely increase stormwater runoff and hydroperiods for receiving drainages. As stated in the Biological Assessment, additional flow contributions to Denverton Creek would be expected to lengthen the hydroperiod of vernal pools off of Travis AFB (Air Force 2007). The Air Force speculates that an increase in hydroperiod could benefit vernal species, including the California tiger salamander in drier years but the increase of hydroperiod in wet years could aid the dispersal of aquatic predators such as stickleback in normal or wet years (Air Force 2007). The Air Force also projects that the additional runoff could increase downstream hydrological connectivity, increasing the potential for the dispersal of aquatic predators and non-native species into more isolated vernal pools.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act.

A number of on-going and proposed projects could contribute to adverse affects to California tiger salamander habitat within Solano County. In most cases, however, these actions would be subject to Federal review and would, therefore, not be considered cumulative to the proposed project. These projects will contribute to the loss and degradation of habitats of listed species across their range. These activities may alter aquatic and upland habitats and can potentially harass, harm, injure, or kill tiger salamanders. Because these activities have a Federal nexus, the Service will analyze these projects to determine if they will result in the jeopardy of federally-listed species and/or adverse modification and destruction of critical habitat for these species. An undetermined number of future projects that alter the California tiger salamander aquatic habitat, however, could go forward without a Federal nexus. Activities that would

potentially affect this listed amphibian include development associated with urban, water, flood control, highway/roadway and utility projects, application of herbicides/pesticides, conversion to agricultural use, and indirect effects of adjacent development such as urban run-off altering the hydrologic regime.

Numerous non-Federal activities continue to negatively affect the California tiger salamander in Solano County. Habitats are lost or degraded as a result of road and utility construction and maintenance, overgrazing, agricultural expansion, and water irrigation and storage projects that may not be funded, permitted, or constructed by a Federal agency. Other threats include contamination, poisoning, increased predation, and competition from non-native species associated with human development. Small private actions that may impact listed species, such as conversion of land, small mammal population control, mosquito control, and residential development, may occur without consultation with or authorization by the Service or the California Department of Fish and Game pursuant to their respectively Endangered Species Act.

Cattle-grazing is a common land use practice in rural Solano County. Overgrazing results in degradation and loss of riparian vegetation, increased water temperatures, streambank and upland erosion, and decreased water quality in streams. Livestock operations also degrade water quality with pesticides and nutrient contamination. However, light to moderate livestock grazing is generally thought to be compatible with continued successful use of rangelands by the tiger salamander, provided the grazed areas do not also have intensive burrowing rodent control efforts (T. Jones, in litt. 1993; Shaffer *et al.* 1993, Shaffer and Trenham, personal communication with the Service, 2003). The shorter vegetation associated with grazed areas may make the habitat more suitable for ground squirrels whose burrows are utilized by tiger salamanders.

Agricultural development, impoundments, and irrigation can alter vernal pool hydrology, resulting in the loss of aquatic breeding habitat for tiger salamanders. Discing is a common practice on agricultural lands which can result in substantial losses of upland habitat for tiger salamanders. Significant conversion of rural, undeveloped land to agricultural land, particularly vineyards, is currently occurring in Solano County, resulting in loss of upland habitat for listed species.

The proposed Jepson Parkway Project, is a 4-lane parkway designed to provide intra-county mobility for Solano residents, generally located north and west of Travis AFB. The project upgrades and links a series of narrow local roads to provide a north-south travel route, and would connect the Interstate-80/Leisure Town Road interchange in Vacaville with State Route 12 in Suisun City (Solano County Transportation Agency, 2000). Within the County's jurisdiction, current development activities include proposed expansion of the Potrero Hills Landfill and additional wind energy/turbines in the Montezuma Hills wind Resource area. Expansion of the Potrero Hill Landfill would affect approximately 245 acre of primarily upland habitat which is inhabited by California tiger salamander.

As urban development continues, it will likely adversely impact upland areas that serve as dispersal and aestivation habitat for tiger salamanders. Continued development and maintenance of roadways to serve expanding urban areas may further fragment and isolate populations of tiger salamanders from other nearby populations and increased road kill due to the construction and use of new roads and increased traffic in the overall region. Increased predation associated with domesticated pets or feral animals generally accompanies urban expansion. As urban development encroaches on rural areas, the need increases for mosquito abatement programs that introduce exotic fish into breeding and non-breeding ponds impact the reproductive success tiger salamanders.

Increased levels of vehicles and increased vehicle speeds could lead to an increased mortality level for the California tiger salamanders. The cumulative local development will result in temporary and permanent habitat fragmentation. The results of fragmentation are inhibition of genetic exchange between populations and impediments to recolonization of habitats from which populations have been extirpated. Small, isolated populations are substantially more vulnerable to stochastic events (e.g., aberrant weather patterns, fluctuations in availability of food) and may exhibit reduced adaptability to environmental (natural or anthropogenic) changes.

The State Route 12 corridor in the Fairfield-Suisun-Rio Vista area has experienced rapid growth over the last several decades. The Association of Bay Area Governments (ABAG) anticipates continued growth in Solano County and expects the County to lead the Bay Area in percentage growth of both population and jobs through 2020. The California Department of Finance projects that Solano County's population will increase from 399,000 in 2000, to 564,900 by 2020, with most growth occurring within the County's three largest cities, Vallejo, Fairfield, and Vacaville. Rio Vista, while still a relatively small community, has led Solano County growth (on terms of percentage growth rate) for the last few years (SCWA 2007). Increased demand for housing will likely result in loss of suitable habitat for the California tiger salamander as housing developments replace agricultural and ranch lands. Increased urbanization in the region will contribute to the degradation of water quality in streams, altered flow regimes, increased contaminated road runoff, loss of upland habitat, and increased human presence in natural areas.

Cumulative effects to the California tiger salamander include continuing and future conversion of suitable breeding, foraging, sheltering, and dispersal habitat resulting from urban development. Additional urbanization can result in road widening and increased traffic on roads that bisect habitat, thereby increasing road-kill while reducing in size and further fragmenting remaining habitats. California tiger salamanders likely are exposed to a variety of pesticides and other chemicals throughout their ranges. This amphibian species could also die from starvation due to the loss of their prey base. Hydrocarbon and other contamination from oil production and road runoff; the application of numerous chemicals for roadside maintenance; urban/suburban landscape maintenance; and rodent and vector control programs may all have negative effects on tiger salamander populations. In addition, tiger salamanders may be harmed through increased road kill due to the construction and use of new roads and increased traffic in the overall region and collection by amphibian enthusiast and others.

As stated in the previous effects section, de-icing C-17 aircraft and maintaining the proposed C-17 runway requires clean-up activities that are designed to contain any harmful materials and reduce the potential discharge into listed species habitat on and off Travis AFB. These same measures are used to maintain and service the existing aircraft and runways on Travis AFB. The proposed C-17 runway will also contribute to the existing stormwater flow directed through potential listed species habitat on and off of Travis AFB. As stated in the previous effects section, the cumulative increase in hydroperiod may benefit listed vernal pool-associated species in years of below average precipitation but may adversely affect these species in normal to wet years by increasing the likelihood of predatory fish invasions and invasive species intrusion by increasing the duration of the hydroperiod and increasing hydrologic connectivity to more isolated vernal pools.

Further habitat fragmentation; additional non-native species introduction; and increased access to aquatic habitat could facilitate or increase the spread of amphibian diseases within the range of the California tiger salamander. The global mass extinction of amphibians primarily due to chytrid fungus continues to be of significant concern (Norris 2007; Skerratt *et al* 2007).

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

The Solano County Water Agency, in cooperation with the cities of Fairfield, Suisun, Rio Vista and several other applicants are currently preparing the Solano Multispecies HCP pursuant to section 10(a)(1)(B) of the Act that is expected to address the effects of land uses and associated conservation activities in this area on listed species (SCWA 2007). This HCP anticipates that actual development will be substantially reduced from the potential 1,000 acres of zoned development land in Fairfield and Suisun (SCWA 2007). Travis AFB is excluded from the HCP because as a federal facility, the effects of development activities on listed species at the Base are addressed through the Section 7 process.

Conclusion

After reviewing the current status of the California tiger salamander, 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 the Travis AFB C-17 Assault Landing Strip Project, as proposed, is not likely to jeopardize the continued existence of this listed species. The proposed project is not located within designated critical habitat for the salamander; therefore, critical habitat for this species will not be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as 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 the Air Force so they become binding conditions of project authorization for the exemption under 7(o) (2) to apply. The Air Force has a continuing duty to regulate the activity that is covered by this incidental take statement. If the Air Force (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of 7(o)(2) may lapse.

Sections 7(b) (4) and 7(o) (2) of the Act generally do not apply to listed plant species. However, protection of listed plants is provided to the extent that the Act prohibits the removal and reduction to possession of federally listed plants or the malicious damage of such plants on areas under Federal jurisdiction, or the destruction of listed plants on non-Federal areas in violation of State law or regulation or in the course of any violation of a State criminal trespass law.

Amount or Extent of Take

The Service expects that incidental take of the California tiger salamander, may occur during this action. The extent of the take will be difficult to detect or quantify because of the ecology and biology of this species. Additionally, their size and cryptic nature makes the finding of a dead specimen unlikely. Seasonal population fluctuations also may mask the ability to determine the exact extent of take. Due to the difficulty in quantifying the number of tiger salamanders that will be taken as a result of the proposed action, the Service is quantifying take incidental to the project as the number of acres of upland tiger salamander habitat that will become unsuitable for tiger salamanders due to direct or indirect effects as a result of the action. Therefore, the Service estimates that the proposed action will result in the take of all California tiger salamanders inhabiting or utilizing 58.1 acres of appropriate upland habitat (35.1 permanent, 23.0 temporary) identified in the action area. Upon implementation of the following reasonable and prudent measures, incidental take associated with the proposed Travis AFB C-17 Assault Landing Strip Project on the listed amphibian, in the form of harm, harassment, injury, or mortality from habitat loss or degradation will become exempt from the prohibitions described under section 9 of the Act.

Effect of the Take

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the California tiger salamander in this biological opinion or result in destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the effects of the Travis Air Force Base C-17 Assault Landing Strip Project on the California tiger salamander:

1. The Air Force shall minimize the effects of the loss of habitat that will occur as a result of the project, the potential for harassment, harm, injury, and mortality to the California tiger salamander, and the potential for inadvertent capture or entrapment of this listed amphibian during construction activities.
2. The Air Force shall ensure their compliance with this biological opinion.

Terms and Conditions

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

1. The following Term and Conditions will implement Reasonable and Prudent Measure number one (1):

a. The project proponents shall minimize the potential for harm, harassment, or killing of federally listed species resulting from project related activities by implementation of the conservation measures as described in the Biological Assessment, and appearing in the Project Description of this biological opinion.

b. If any portion of the described temporary work areas is not restored within one year of the start of construction, the Air Force shall consult with the Service on the effects of these actions on listed species as permanent.

2. The following Terms and Conditions implement Reasonable and Prudent Measure two (2):

a. As part of the construction contract, the Air Force shall require that all contractors comply with the Act in the performance of work necessary for project completion inside and outside the project right-of-way.

b. The Air Force shall require documentation from the contractor ensuring that aggregate, fill, or borrow material was obtained or disposed of in compliance with the Act. Evidence of compliance with the Act shall be demonstrated by providing the Resident Engineer any one of the following:

1. a letter from the Service stating use of the borrow pit area or disposal area will not result in the incidental take of listed species;

2. an incidental take permit for contractor-related activities issued by the Service pursuant to section 10(a)(1)(B) of the Act;

3. a biological opinion or a letter concurring with a "not likely to adversely affect" determination issued by the Service to the Federal agency having jurisdiction over contractor-related activities;

4. letter from the Service concurring with the "no effect" determination for contractor-related activities; or

5. Contractor submittal of information to the Resident Officer In Charge of Construction indicating compliance with the State Mining and Reclamation Act (SMARA) and provide the County land use permits and California Quality Act (CEQA) clearance.

c. If a borrow or disposal site that is in compliance with the Act is not available, the Air Force shall either:

1. identify/select a site that the Service has concurred with the "no effect" determination, or;

2. request reinitiation of formal consultation on the action considered herein based on new information.

d. The project proponents shall immediately report to the Service by electronic mail and telephone any information about take or suspected take of listed wildlife species not authorized in this biological opinion. The Air Force must notify the Service via electronic mail and telephone within twenty-four (24) hours of receiving such information. Notification must include the date, time, location of the incident or of the finding of a dead or injured animal, and photographs of the specific animal. The individual animal shall be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen or the Service takes custody of the specimen. The Service contacts are Peter Cross, Deputy Assistant Field Supervisor, Endangered Species Program, Sacramento Fish and Wildlife Office at (916) 414-6600, and the Resident Agent-in-Charge of the Service's Law Enforcement Division at (916) 414-6660.

Reporting Requirements

The Service shall be notified within one (1) working day of the finding of any injured or dead California tiger salamander. Injured tiger salamanders shall be cared for by a licensed veterinarian or other qualified person. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal clearly indicated on a USGS 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information. The Service contacts are Peter Cross, Deputy Assistant Field Supervisor, Endangered Species Program at the Sacramento Fish and Wildlife Office telephone (916) 414-6600, and the Resident Agent-in-Charge of the Service's Law Enforcement Division at telephone (916) 414-6660. This Airforce must also contact the California Department of Fish and Game immediately in the case of a dead or injured listed species. The California Department of Fish and Game contact for immediate assistance is State Dispatch at (916) 445-0045.

Sightings of any listed or sensitive animal species should be reported to the California Natural Diversity Database of the California Department of Fish and Game. A copy of the reporting form and a topographic map clearly marked with the location the animals were observed also should be provided to the Service.

The Air Force shall submit a post-construction compliance report prepared by the on-site biologist to the Sacramento Fish and Wildlife Office within sixty (60) calendar days of the date of the completion of construction activity. This report shall detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting compensation and other conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the California tiger salamander, if any; (v) occurrences of incidental take of any listed species, if any; and (vi) other pertinent information

CONSERVATION RECOMMENDATIONS

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

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

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

3. The Air Force should consider installing barriers to deter salamanders from entering areas such as roads and housing areas where they are likely to be killed.

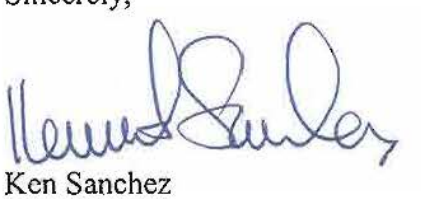
4. The Air Force should consider participating in the planning for a regional habitat conservation plan for listed and sensitive species.

5. The Air Force should consider establishing functioning preservation and creation conservation banking systems to further the conservation of listed species. Such banking systems also could possibly be utilized for other required mitigation (i.e., seasonal wetlands, riparian habitats, etc.) where appropriate.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the proposed Travis AFB C-17 Assault Landing Strip Project in Solano County, California. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. If you have any questions regarding this biological opinion on the Travis AFB C-17 Assault Landing Strip, please contact the Michelle Tovar or the acting Sacramento Valley Branch Chief at 916-414-6600.

Sincerely,



Ken Sanchez
Assistant Field Supervisor

cc:
Jane M. Hicks, U.S. Army Corps of Engineers, San Francisco, California
Anna Holmes, California Department of Fish and Game, Yountville, California
Marjorie Eisert, CH2MHILL, Sacramento, California

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APPENDIX E
NATIVE AMERICAN COORDINATION

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NATIVE AMERICAN COORDINATION

To ensure that any sites of traditional cultural value are identified and adequately considered under the proposed action, The Air Force sent the notification letters in this appendix to the tribes announcing the action and requesting concerns regarding the proposed action. One response was received regarding Travis AFB.

The Air Force sent the draft EA to the tribes to whom notification letters were sent. The distribution list is included in Appendix A.

A copy of the final EA was sent to each of the tribes to whom notification letters were sent. The distribution list is included in Appendix A.

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PARSONS

8000 Centre Park Drive, Suite 200 Austin, Texas ⊕ 78754-5140 ⊕ (512) 719-6000 ⊕ Fax: (512) 719-6099 ⊕ www.parsons.com

September 11, 2007

SUBJECT: Environmental Assessments for an Interim and a Permanent C-17 Landing Zone in the Western United States

TO: See Distribution

The United States. Air Force, with Parsons assistance, is preparing two Environmental Assessments (EAs) for an Interim and a Permanent C-17 Landing Zone in the western United States. The Air Force will complete basing 13 C-17 aircraft at Travis Air Force Base (AFB), California in 2008. Additionally, basing eight C-17s at March Air Reserve Base (ARB), California was completed in 2006. A key ability of the C-17 aircraft is its capability to land and take off from a short runway called a landing zone (LZ) that is 3,500 feet to 5,000 feet long and 90 feet wide. An important element of C-17 basing is that aircrews have access to an airfield with an LZ at which they can conduct tactical arrival, departure, and landing training. Currently, there is no LZ available in close proximity to Travis AFB or March ARB at which aircrews from the bases can conduct training.

For the Interim C-17 LZ EA, two project alternatives in California consist of painting a 3,500 foot-long, 90-foot-wide LZ threshold and side boundaries in the middle of existing runways, and installing landing zone marking panels and an IR lighting system at either Travis AFB or at the Southern California Logistics Airport (SCLA). Neither alternative involves any new construction. Operations would begin in late 2007 and continue until the permanent LZ is constructed.

For the Permanent C-17 LZ EA, the Proposed Action would consist of construction of a 3,500 foot-long, 90-foot-wide LZ with associated day/night LZ markings and an infrared (IR) lighting system for night vision goggle (NVG) operations on the Travis AFB airfield. The Project Alternative consists of construction of a permanent LZ at the SCLA in southern California. It is anticipated that construction would begin in 2008, be completed in 2009, and that aircraft operations would begin after the LZ is completed.

As part of these efforts, and in compliance with the National Historic Preservation Act of 1966, as amended, the American Indian Religious Freedom Act, and the Native American Graves Protection and Repatriation Act of 1990, we are initiating correspondence and consultation efforts with affiliated tribal groups regarding the two locations in California.

To ensure that any areas of sacred or spiritual significance to Native American groups are considered, we would appreciate your help in identifying any interests or concerns regarding traditional resources or properties within the project areas.

Please provide any comments or information by October 19, 2007. You may address any comments or questions to Mr. Doug Allbright, HQAMC/A7CP, 507 Symington Drive, Scott

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AFB, IL 62225. Mr. Allbright may be reached by phoning (618) 229-0846 or via e-mail at: Doug.Allbright@scott.af.mil.

Sincerely,

Parsons Project Manager

Attachments:

Location of Interim LZ at Travis AFB

Location of Interim LZ at SCLA

Location of Permanent LZ at Travis AFB

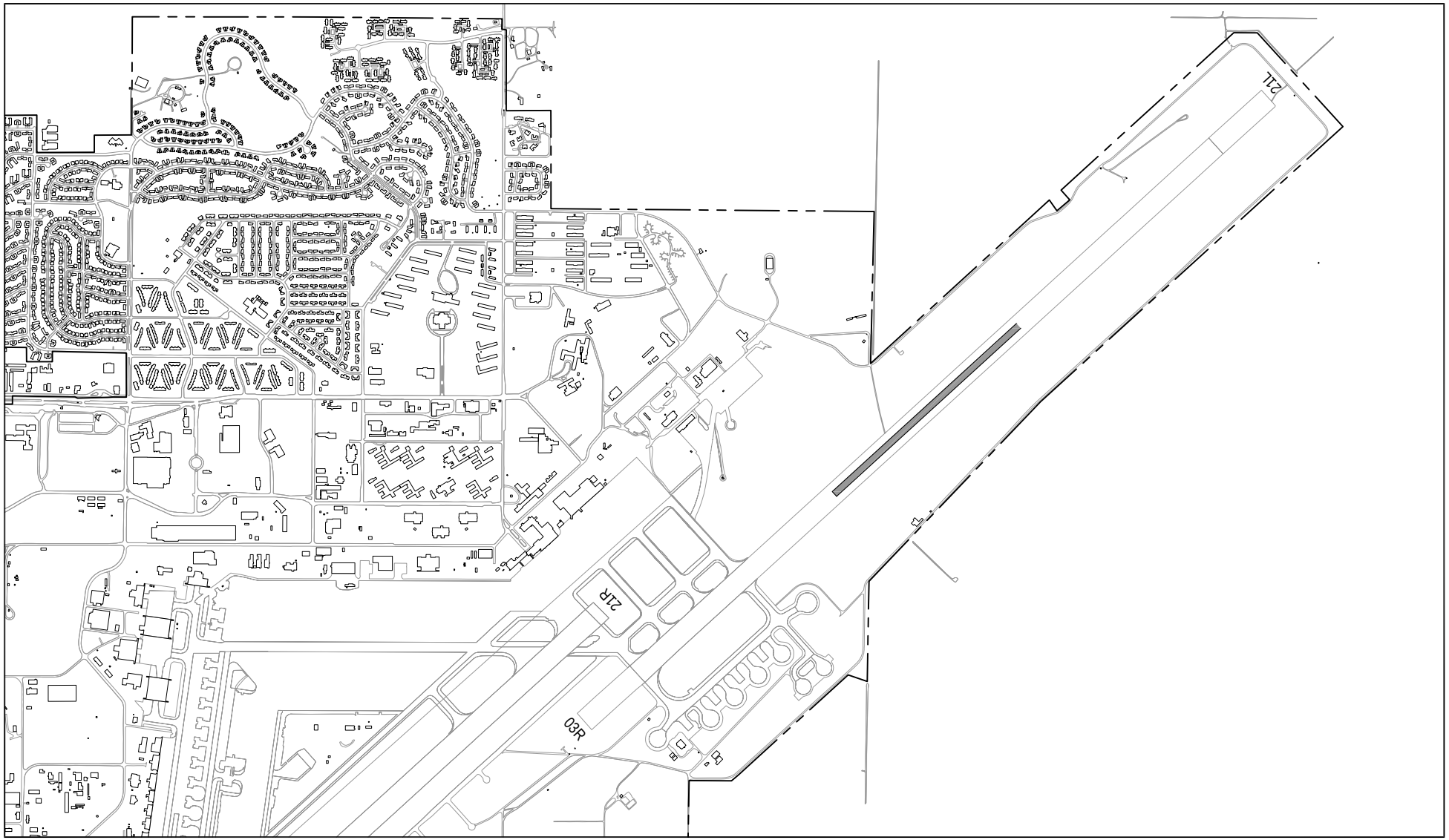
Location of Permanent LZ at SCLA

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Distribution List

California		
Linda Otero, Director **AhaMaKav Cultural Society** **Fort Mojave Indian Tribe** P.O. Box 5990 Mohave Valley, AZ 86440	Elaine Patterson, Chairperson **Cortina Band of Indians** P.O. Box 1630 Williams, CA 95987	Charles Wood, Chairperson **Chemehuevi Reservation** P.O. Box 1976 Chemehuevi Valley, CA 92363
Britt W. Wilson, Cultural Resources-Project Manager **Morongo Band of Mission Indians** 49750 Seminole Drive Cabazon, CA 92230	Marshall McKay, Chairperson **Rumsey Rancheria** P.O. Box 18 Brooks, CA 95606	John Valenzuela, Chairperson **San Fernando Band of Mission Indians** P.O. Box 221838 Newhall, CA 91322
Henry Duro, Chairperson **San Manuel Band of Mission Indians** 26569 Community Center Drive Highland, CA 92346	Ann Brierty, Environmental Department **San Manuel Band of Mission Indians** 101 Pure Water Lane Highland, CA 92346	Goldie Walker **Serrano Band of Indians** 6588 Valeria Drive Highland, CA 92346
Wintun Environmental Protection Agency P.O. Box 1839 Williams, CA 95987	Charlie Cooke **Tehachapi Indian Tribe** 32835 Santiago Road Acton, CA 993510	Kesner Flores P.O. Box 1047 Wheatland, CA 95692
Ron Wermuth P.O. Box 168 Kernville, CA 93238	HQ AMC/A7CP Mr. Doug Allbright 507 Symington Drive Scott AFB, IL 6225	60 CES/CEVP Mr. Rudy Pontemayor 411 Airmen Drive Travis, AFB, CA 94535

744211 WCLZ-TR-ALZ.DWG



Travis AFB

LEGEND

Proposed Landing Zone Location

Installation Boundary

N

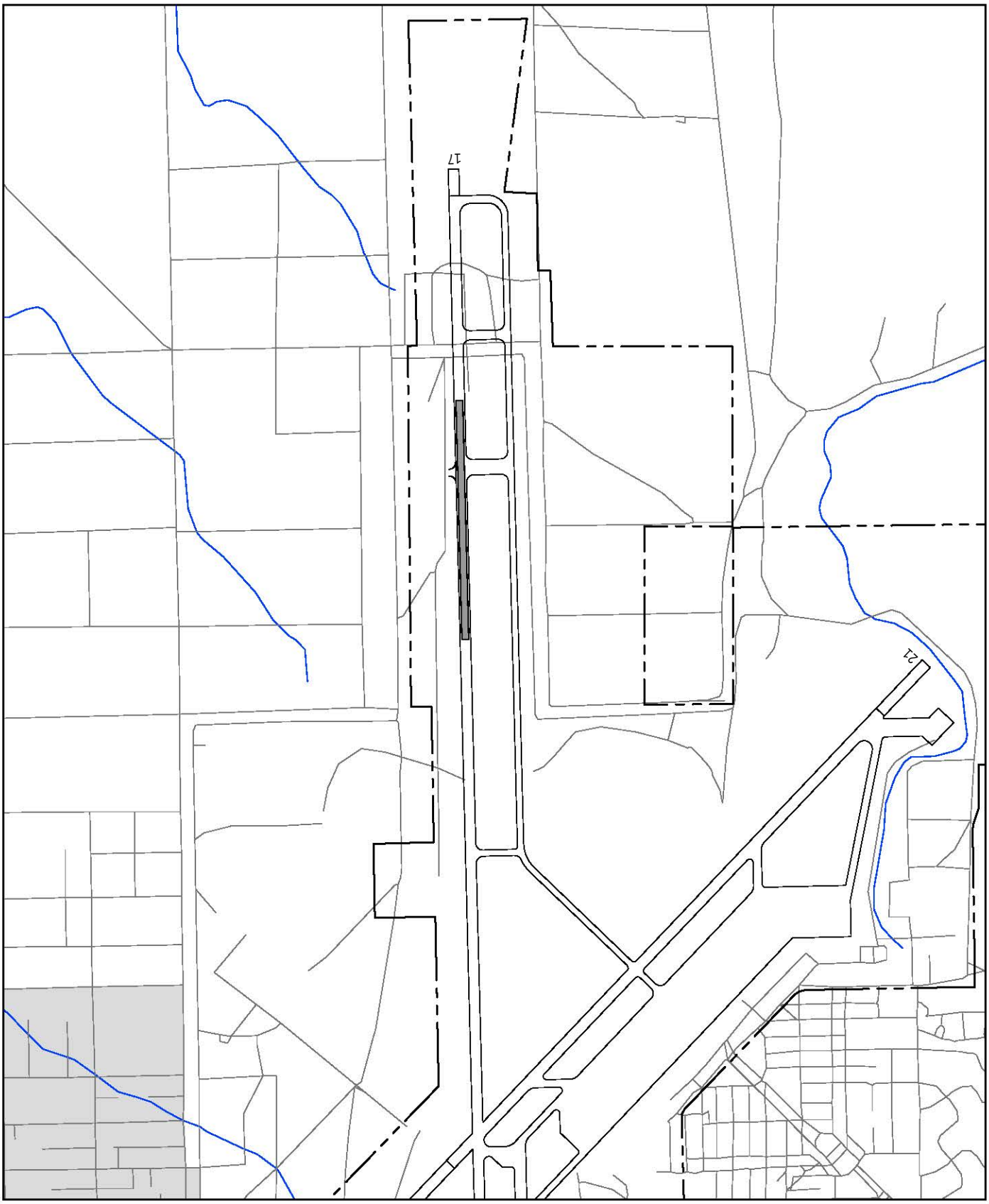
0 2,000

Feet

Note:
Proposed LZ location is approximate.

Landing Zone Location, Travis AFB Alternative

Figure 2-3



Southern California Logistics Airport

LEGEND

Proposed Landing Zone Location

Installation Boundary

N

0 2,000

Feet

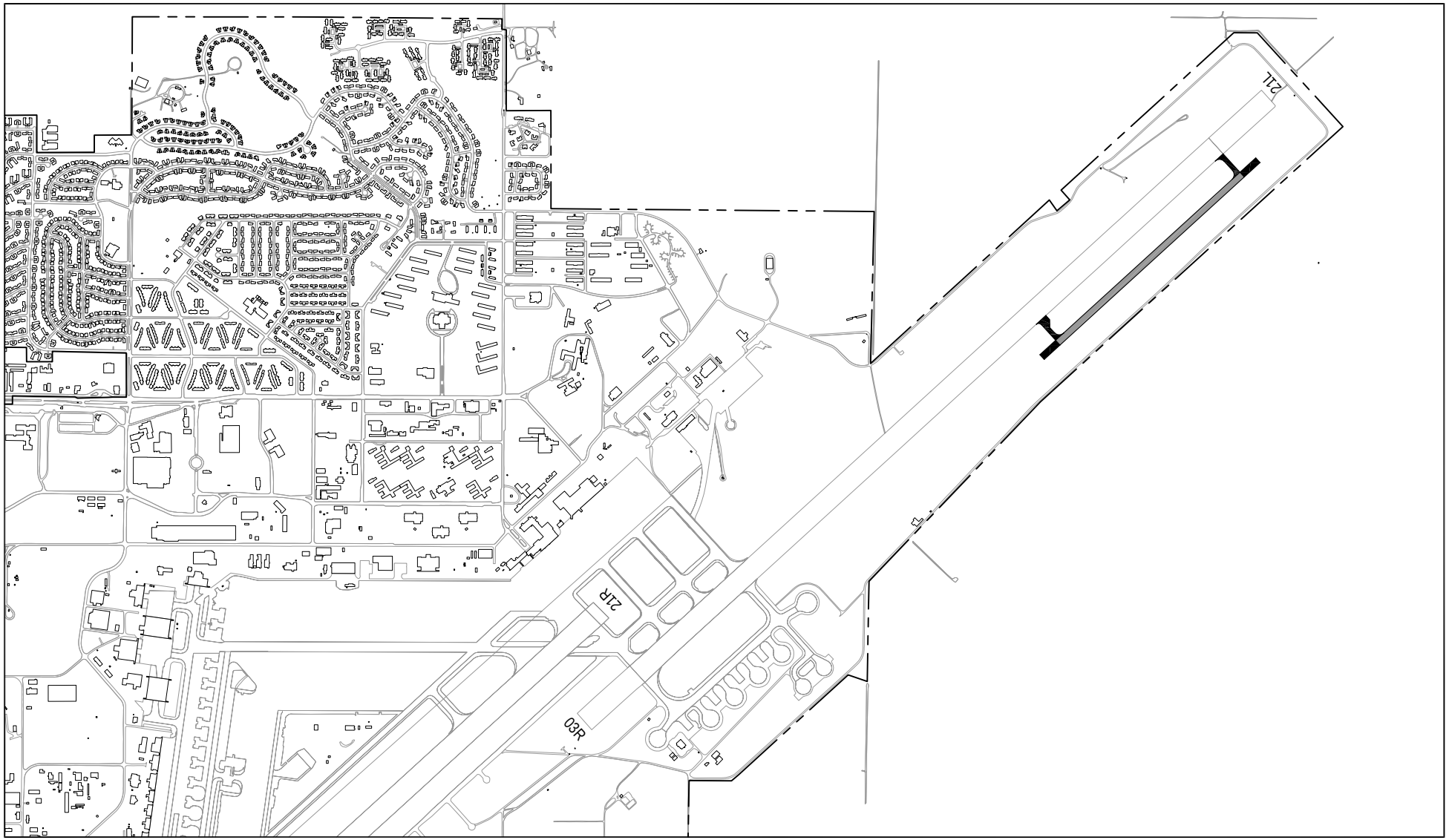
Note:
Proposed LZ location is approximate.

744211 WCLZ-SCL-ALZ.DWG

Landing Zone Location, Southern California Logistics Airport Landing Zone Alternative

Figure 2-4

744211 WCLZ-TR-ALZ.DWG



Travis AFB

LEGEND

Proposed Landing Zone Location

Installation Boundary

N

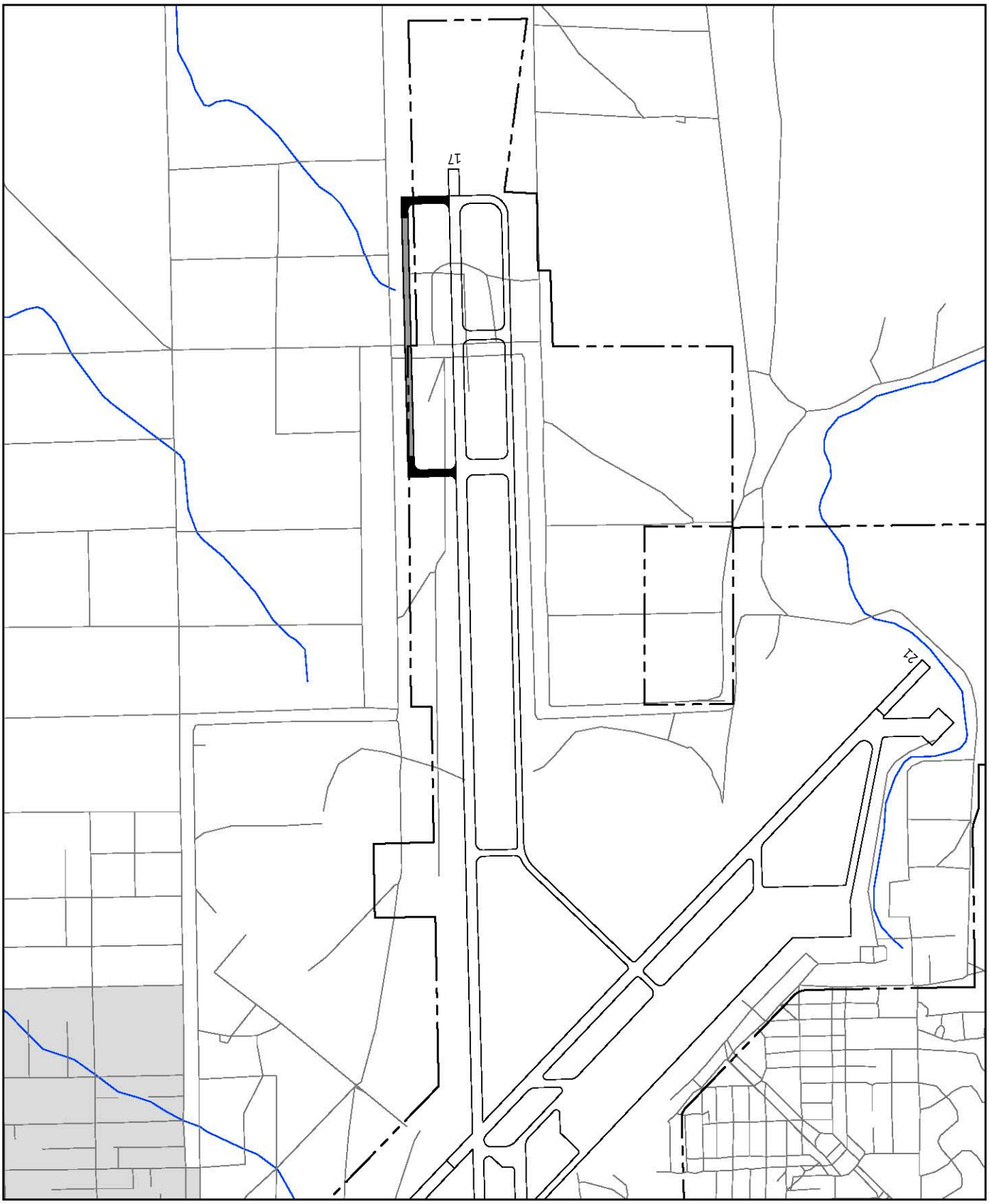
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Feet

Note:
Proposed LZ location is approximate.

Landing Zone Location, Travis AFB Alternative

Figure 2-2



Southern California Logistics Airport

LEGEND

Proposed Landing Zone Location

Installation Boundary

N

0 2,000

Feet

Note:
Proposed LZ location is approximate.

744211 WCLZ-SCL-ALZ.DWG

Landing Zone Location, Southern California Logistics Airport Landing Zone Alternative

Figure 2-5

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September 11, 2007

SUBJECT: Environmental Assessment for an Interim C-17 Landing Zone in the Western United States

TO: See Distribution

The United States Air Force, with Parsons assistance, is preparing an Environmental Assessment (EA) for an Interim C-17 Landing Zone in the western United States. The Air Force will complete basing 13 C-17 aircraft at Travis Air Force Base (AFB), California in 2008. Additionally, basing eight C-17s at March Air Reserve Base (ARB), California was completed in 2006. A key ability of the C-17 aircraft is its capability to land and take off from a short runway called a landing zone (LZ) that is 3,500 feet to 5,000 feet long and 90 feet wide. An important element of C-17 basing is that aircrews have access to an airfield with an LZ at which they can conduct tactical arrival, departure, and landing training. Currently, there is no LZ available in close proximity to Travis AFB or March ARB at which aircrews from the bases can conduct training.

Under the Proposed Action, aircrews from Travis AFB and March ARB would use the existing C-17 LZ at Grant County International Airport, Moses Lake, Washington. The LZ is currently used for training by C-17 aircrews from McChord AFB, Washington. Operations would begin in late 2007 and continue until approximately 2009.

As part of this effort, and in compliance with the National Historic Preservation Act of 1966, as amended, the American Indian Religious Freedom Act, and the Native American Graves Protection and Repatriation Act of 1990, we are initiating correspondence and consultation efforts with affiliated tribal groups regarding the Grant County International Airport near Lake Moses.

To ensure that any areas of sacred or spiritual significance to Native American groups are considered, we would appreciate your help in identifying any interests or concerns regarding traditional resources or properties within the project area.

Please provide any comments or information by October 19, 2007. You may address any comments or questions to Mr. Doug Allbright, HQAMC/A7CP, 507 Symington Drive, Scott AFB, IL 62225. Mr. Allbright may be reached by phoning (618) 229-0846 or via e-mail at: Doug.Allbright@scott.af.mil.

Sincerely,

Parsons Project Manager

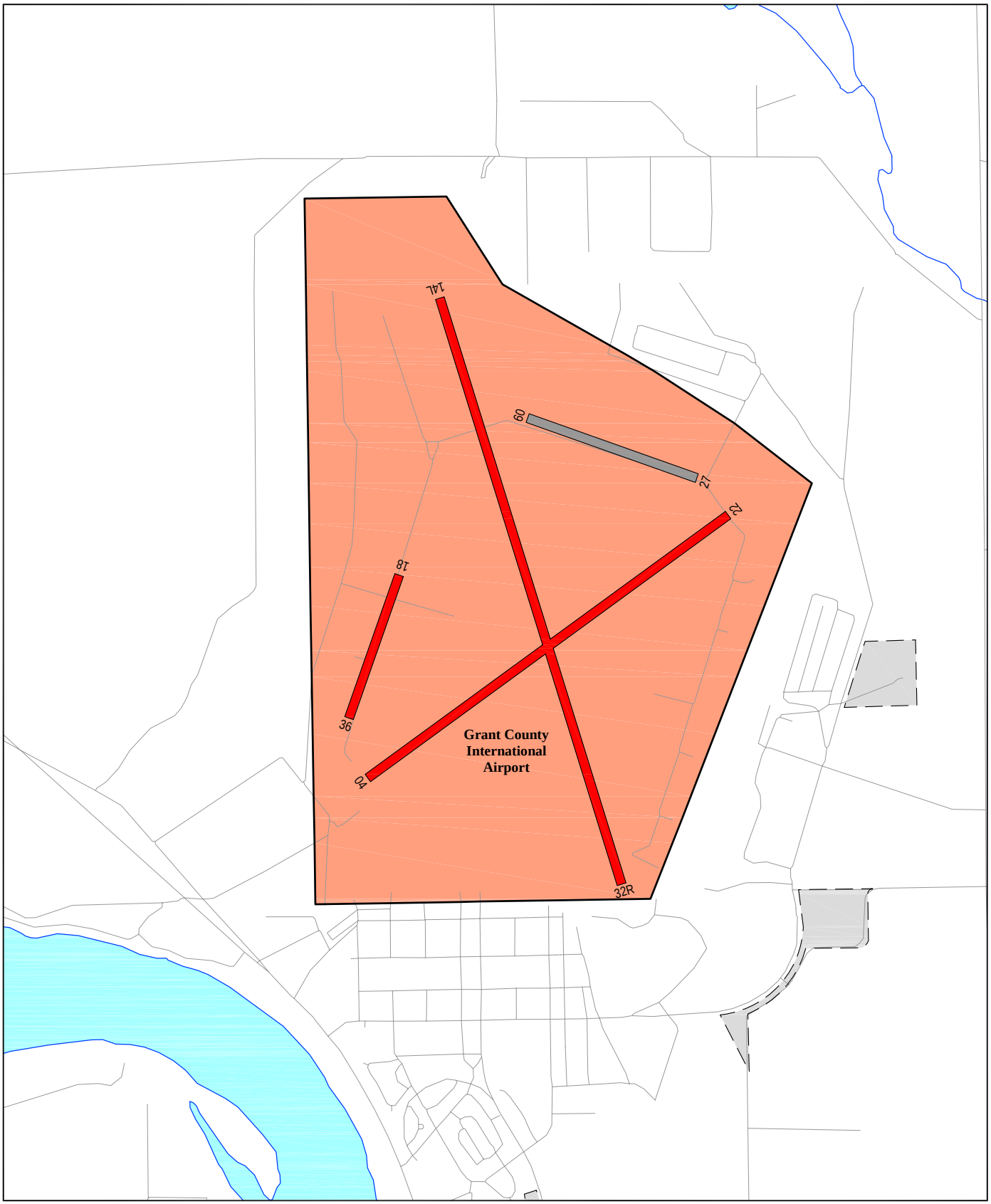
Attachment:
Location of Interim LZ at Grant County International Airport

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Distribution List

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HQ AMC/A7CP Mr. Doug Allbright 507 Symington Drive Scott AFB, IL 6225	60 CES/CEVP Mr. Rudy Pontemayor 411 Airmen Drive Travis, AFB, CA 94535	



Grant County International Airport

LEGEND

Proposed Landing Zone Location

Roadway

N

0 3,000

Feet

Note:
Proposed LZ location is approximate.

744211 WCLZ-ML-ALZ.DWG

Landing Zone Location, Grant County Airport

Figure 2-2

Rumsey Band of
Wintun Indians

Rumsey Indian Rancheria

YOCHA-DE-HE

October 8, 2007

Mr. Doug Allbright
HQAMC/A7CP
507 Symington Drive
Scott AFB, ILL 62225

Re: Environmental Assessments for an Interim and a Permanent C-17 Landing Zone in the Western United States

Dear Mr. Allbright:

Thank you for your letter dated, September 11, 2007, seeking information regarding historic/sacred sites on the proposed interim C-17 Landing Zone at Travis AFB, your proposed building site. We appreciate your efforts to contact us, and wish to respond.

Based on the information provided, Rumsey Indian Rancheria of Wintun is not aware of any "historic properties" on this site. However, we do recommend that you contact the CHRIS Northwest Information Center at Sonoma State University. As the project progresses, if any new information or historic remains are found, we do have a process to protect such important and sacred artifacts.

Upon such a finding, please contact the following individuals:

Mr. Marshall McKay
Chairman, Rumsey Indian Rancheria of Wintun
Office: (530)796-3400
mmckay@rumseywintun-nsn.gov

Mr. Leland Kinter
Office: (530)796-3400
Windug21@hotmail.com

And copy all communications to:

Rumsey Indian Rancheria

YOCHA-DE-HE

Rumsey Band of
Wintun Indians

Ms. Michelle LaPena
Attorney
LaPena Law Corporation
2001 N Street, Suite 100
Sacramento, CA 95811

Thank you again for your commitment to preserving our cultural heritage.

Sincerely,

Marshall McKay

Tribal Chairman