DRAFT

Initial Study and Mitigated Negative Declaration Vina Helitack Base Replacement Project

August 2014

Lead Agency:

State of California
Dept. of Forestry and Fire Protection (CAL FIRE)
1419 9th Street, Sacramento, CA 94244

Prepared For:

CALIFORNIA DEPARTMENT OF GENERAL SERVICES
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DRAFT MITIGATED NEGATIVE DECLARATION
VINA HELITACK BASE REPLACEMENT PROJECT

Lead Agency: State of California Department of Forestry and Fire Protection (CAL FIRE)

Project Proponent: State of California Department of General Services – Real Estate Services Division

Project Location: The Proposed Project would be located in Northern California adjacent to State Route (SR) 99. The 7.4-acre site is approximately 25 miles southeast of the City of Red Bluff and 18 miles northwest of the City of Chico, near the unincorporated community of Vina in Tehama County.

Project Description: The Proposed Project would involve the replacement and expansion of the existing CAL FIRE Vina Helitack Base complex. The Project would include the demolition and new construction of several elements.

Proposed Finding: Less than significant with mitigation

Public Review Period: August 8, 2014, to September 8, 2014

Mitigation Measures Incorporated into the Project to Avoid Significant Effects

Air Quality

Implementation of the Proposed Project would result in short-term emissions from construction as well as demolition activities associated with deconstruction of the existing helitack base.

Mitigation Measure

AQ-1 Construction Emissions Reduction

The California Department of Forestry and Fire Protection (CAL FIRE) shall submit to the Tehama County Air Pollution Control District and receive approval for an Emissions Reduction Plan prior to groundbreaking. The Emissions Reduction Plan shall include the measures recommended by TCAPCD, at the time of development, for the control of fugitive and mobile-source emissions associated with on-site construction activities. At the present time, these measures include, but are not limited to, the following:

A. The applicant shall be responsible for ensuring that all adequate dust control measures are implemented in a timely and effective manner during all phases of Project development and construction.

B. All material excavated, stockpiled, or graded shall be sufficiently watered to prevent fugitive dust from leaving property boundaries and causing a public nuisance or a violation of an ambient air standard. Watering shall occur at least twice daily with complete site coverage, preferably in the mid-morning and after work is completed each day.

C. All areas (including unpaved roads) with vehicle traffic should be watered periodically or have dust palliatives applied for stabilization of dust emissions.

D. All on-site vehicles shall be limited to a speed of 15 miles per hour on unpaved roads.

E. All land clearing, grading, earth-moving, or excavation activities on the Project site shall be suspended when sustained winds are expected to exceed 20 miles per hour.

F. All portions of the development site that have been stripped of vegetation by construction activities and left inactive for more than ten days shall be seeded and/or watered until a suitable grass cover is established.

G. All trucks hauling dirt, sand, soil, or loose material shall be covered or shall maintain at least 2 feet of freeboard (i.e., minimum vertical distance between top of the load and the trailer) in accordance with the requirements of California Vehicle Code Section 23114. This provision shall be enforced by local law enforcement agencies.

H. All material transported off site shall be either sufficiently watered or securely covered to prevent a public nuisance.

I. Wheel washers shall be installed where project vehicles and/or equipment enter and/or exit onto paved streets from unpaved roads. Vehicles and/or equipment shall be washed prior to each trip.

J. Prior to final occupancy, the applicant shall re-establish ground cover on the construction site through seeding and watering.

K. Off-road construction equipment shall not be left idling for periods longer than 5 minutes when not in use.

Timing/Implementation: *Approval of Emissions Reduction Plan prior to groundbreaking. Enforcement of Plan during construction*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

Biological Resources

A number of special-status species have the potential to occur on the site. A preconstruction nesting bird survey of all suitable habitats on the Project site shall be conducted within 14 days prior to initiation of construction activities during the nesting season (February 1–August 31), as stated in mitigation measures B-3, B-5 and B-6. If construction activities are initiated during the non-nesting season, nesting bird surveys would not need to be conducted. Preconstruction surveys that cannot be avoided by seasons are the burrowing owl survey, focused plant surveys, and western spadefoot survey as stated in mitigation measure B-1, B-2, and B-4. Additionally, the off-site roadside improvement area supports 0.019 acre of potential waters of the United States and marginal potential vernal pool crustacean habitat. Therefore, mitigation measures have been included to reduce potential impacts to a less than significant level.

Mitigation Measures

B-1 Special-Status Plants

The Project site supports limited potential habitat for adobe lily, which has low likelihood of occurring in the off-site SR 99 right-of-way. The following mitigation measure is included to minimize potential impacts to this plant:

A. Perform focused plant surveys according to California Native Plant Society (CNPS) protocol. Surveys should be timed according to the blooming period for adobe lily (February–April), and a known reference population should be visited prior to surveys to confirm the species is blooming where known to occur.

B. If adobe lily is found, avoidance zones shall be established around plants to clearly demarcate areas for avoidance. Avoidance measures and buffer distances shall be determined by a qualified botanist in consultation with the CDFW.

C. If adobe lily is found within the Project site and avoidance of the species is not possible, additional measures such as seed collection and/or translocation shall be developed by a qualified botanist in consultation with the CDFW.

D. If no special-status plants are found, no further measures pertaining to special-status plants are necessary.

Timing/Implementation: *Conduct plant survey during blooming period (February to April). Enforce avoidance measures during construction if adobe lily is found*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

B-2 Burrowing Owl

Burrowing owls (a federal species of concern and CDFW species of special concern) have potential to occur on-site. To minimize impacts to protected burrowing owls and their burrows, the following mitigation measure is included:

A. If possible, initiate site construction activities during the non-breeding season, September 1 through January 31.

B. Conduct a preconstruction burrowing owl survey within 14 days prior to initiation of construction activity, according to the Staff Report on Burrowing Owl Mitigation (CDFG 2012). If no burrowing owls or sign are observed, construction may proceed.

C. If burrowing owls or sign are found, implement avoidance setbacks according to the CDFG (2012).

D. If avoidance setbacks are infeasible, coordinate with the CDFW to conduct passive relocation according to protocol outlined in the Staff Report on Burrowing Owl Mitigation (CDFG 2012). If passive relocation methods are employed, the project impact site should be rendered inhospitable for further burrowing owl reoccupation.

Timing/Implementation: *Preconstruction survey within 14 days prior to initiation of construction activity*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

B-3 Loggerhead Shrike/Grasshopper Sparrow

The Project site supports marginal potential nesting habitat for two special-status passerine bird species: loggerhead shrike (a federal species of concern and CDFW species of special concern) and grasshopper sparrow (CDFW species of special concern). To ensure there are no impacts to protected active nests, the following mitigation measure is included:

A. Conduct a preconstruction nesting bird survey of all suitable habitats on the Project site within 14 days prior to initiation of construction activity during the nesting season for the loggerhead shrike (generally February–July) and grasshopper sparrow (generally March–July).

B. If active nests are found, the nests should be monitored prior to any construction-related activity to establish a behavioral baseline. A no-disturbance buffer around the nest shall be established. The buffer distance shall be established by a qualified biologist in consultation with the CDFW. Once construction activities commence on-site, all nests will be monitored by a qualified biologist to detect any behavioral changes as a result of construction of the Proposed Project. If behavioral changes are observed that may result in adverse effects to the success of breeding, the work causing that change shall cease and consultation with the CDFW shall be initiated to identify potential avoidance and minimization measures. Preconstruction bird nesting surveys are not required for construction activity outside the nesting season.

C. If no active special-status bird nests are found, no further measures pertaining to special-status birds are necessary.

Timing/Implementation: *Preconstruction survey within 14 days prior to initiation of construction activity during February through July*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

B-4 Western Spadefoot

The Project site supports potential foraging or refuge habitat for the western spadefoot (CDFW species of special concern). Therefore, the following mitigation measure is included:

A. Perform preconstruction surveys within 14 days prior to the start of construction. If adult or juvenile spadefoots are found, relocate to nearby suitable habitat in consultation with the CDFW.

Timing/Implementation: *Preconstruction survey within 14 days prior to initiation of construction activity*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

B-5 Nesting Raptors

All raptors and their active nests are protected under the California Fish and Game Code and the federal MBTA. To ensure there are no impacts to protected active nests, the following mitigation measure is included:

A. Conduct a preconstruction nesting bird survey of all suitable habitats on the Project site within 14 days prior to the initiation of construction activity during the nesting season (February 1–August 31).

B. If active nests are found, the active nests will be monitored for the first 24 hours prior to any construction-related activity to establish a behavioral baseline. A no-disturbance buffer around the nest shall be established. The buffer distance shall be established by a qualified biologist in accordance with the CDFW's recommendations for buffer distances relative to the species identified. Once construction activities commence on-site, all nests will be monitored by a qualified biologist to detect any behavioral changes as a result of construction of the Proposed Project. If behavioral changes are observed that may result in adverse effects to the success of breeding, the work causing that change shall cease and consultation with the CDFW shall be initiated to identify potential avoidance and minimization measures. Preconstruction raptor nesting surveys are not required for construction activity outside the nesting season.

C. If no active raptor nests are found, no further measures pertaining to raptor nests are necessary.

Timing/Implementation: *Preconstruction survey within 14 days prior to initiation of construction activity February through August*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

B-6 Birds Covered Under the Migratory Bird Treaty Act

Many birds, including commonly occurring species such as mourning dove, western meadowlark, and northern mockingbird, are protected under the California Fish and Game Code and the federal MBTA. A complete list of birds protected can be found in 50 Code of Federal Regulations (CFR) 10.13. To ensure there are no impacts to protected birds or their active nests, the following mitigation measure is included:

A. Conduct a preconstruction nesting bird survey of all suitable habitats on the Project site within 14 days prior to initiation of construction activity during the nesting season (February 1–August 31).

B. If active nests are found, the active nests will be monitored prior to any construction-related activity to establish a behavioral baseline. A no-disturbance buffer around the nest shall be established. The buffer distance shall be established by a qualified biologist in consultation with the CDFW. Once construction activities commence on-site, all nests will be monitored by a qualified biologist to detect any behavioral changes as a result of construction of the Proposed Project. If behavioral changes are observed that may result in adverse effects to the success of breeding, the work causing that change shall cease and consultation with the CDFW shall be initiated to identify potential avoidance and minimization measures.

Preconstruction bird nesting surveys are not required for construction activity outside the nesting season.

C. If no special-status birds are found, no further measures pertaining to special-status birds are necessary.

Timing/Implementation: *Preconstruction survey within 14 days prior to initiation of construction activity February through August*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

B-7 Vernal Pool Crustaceans

The following mitigation measure is included to minimize potential impacts to vernal pool crustaceans:

A. The Project will require consultation under Section 7 of the ESA, which will be pursued concurrent with the submittal of the Section 404 application.

B. Based on findings of the Biological Resources Assessment (ECORP 2014a) and the Section 404 application, the USFWS may issue a Biological Opinion (BO), a document that states the opinion of the USFWS as to whether or not an action by another federal agency (USACE) is likely to jeopardize the continued existence of a listed species (vernal pool fairy shrimp) or result in the destruction or adverse modification of critical habitat. The BO shall provide measures to contribute to the conservation of and adequately mitigate for any potential adverse effects to federally listed vernal pool crustacean species.

Timing/Implementation: *Prior to initiation of construction activities*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

B-8 Waters of the United States

The following mitigation measure is included to minimize potential impacts to waters of the United States:

A. An application for authorization to fill wetlands under Section 404 of the federal Clean Water Act will be prepared and submitted to the USACE.

B. If mitigation is required for the fill of wetlands, mitigation shall be obtained through the purchase of off-site credits or other means to ensure no net loss of wetland acreage.

Timing/Implementation: *Prior to initiation of construction activities*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

Cultural Resources

Due to the sensitivity of the Project area, there remains a possibility that unrecorded cultural resources are present beneath the ground surface and that such resources could be exposed during Project construction. Both CEQA and Section 106 of the National Historic Preservation Act require the lead agency to address any unanticipated cultural resource discoveries during Project construction. Mitigation measures C-1 and C-2 would reduce potential adverse impacts to less than significant with mitigation implemented.

Mitigation Measures

C-1 Unanticipated Discovery

If subsurface deposits believed to be cultural or human in origin are discovered during construction, all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for a prehistoric and historic archaeologist, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no-work radius as appropriate, using professional judgment. A Native American monitor, following the Guidelines for Monitors/Consultants of Native American Cultural, Religious, and Burial Sites established by the Native American Heritage Commission, shall be required if the nature of the unanticipated discovery is prehistoric.

Work cannot continue within the no-work radius until the archaeologist conducts sufficient research and data collection to make a determination that the resource is either (1) not cultural in origin or (2) not potentially significant or eligible for listing on the NRHP or the CRHR.

If a potentially eligible resource is encountered, the archaeologist, lead agency, and Project proponent shall arrange for either (1) total avoidance of the resource, if possible, or (2) test excavations to evaluate eligibility and, if eligible, total data recovery as mitigation. The determination shall be formally documented in writing and submitted to the lead agency as verification that the provisions in CEQA/NEPA for managing unanticipated discoveries have been met.

In the event that fossils are encountered, they shall be analyzed to a point of identification and curated at an established accredited museum repository with permanent retrievable paleontological storage. A technical report of findings shall be prepared with an appended itemized inventory of identified specimens and submitted with the recovered specimens to the curation facility.

Timing/Implementation: *During construction activities*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

C-2 Discovery of Unknown Human Remains

In the event that evidence of human remains is discovered, construction activities within 100 feet of the discovery will be halted or diverted and the requirements of this mitigation measure will be implemented. In addition, the provisions of Section 7050.5 of the California Health and Safety Code, Section 5097.98 of the California Public Resources Code, and

Assembly Bill (AB) 2641 will be implemented. When human remains are discovered, state law requires that the discovery be reported to the county coroner (Section 7050.5 of the Health and Safety Code) and that reasonable protection measures be taken during construction to protect the discovery from disturbance (AB 2641). If the coroner determines the remains are Native American, the coroner notifies the Native American Heritage Commission, which then designates a Native American Most Likely Descendant (MLD) for the Project (PRC Section 5097.98). The designated MLD then has 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains (AB 2641). If the landowner does not agree with the recommendations of the MLD, the NAHC can mediate (PRC Section 5097.94). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (PRC Section 5097.98). This will also include either recording the site with the NAHC or the appropriate Information Center, using an open space or conservation zoning designation or easement, or recording a document with the county in which the property is located (AB 2641).

Timing/Implementation: *During construction activities*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

Hazards and Hazardous Materials

Demolition of the Project buildings and asphalt and concrete areas would result in a potential exposure to a hazardous material and therefore require mitigation.

Mitigation Measure

HM-1 Removal of Asbestos and Lead-Based Paint

The Project applicant shall be required to retain an EPA-Certified Asbestos Professional and EPA Lead-Safe Certified contractor to prepare an Asbestos/Lead Paint Management Plan that includes lead and asbestos inspection notes and sampling results, as well as a Respiratory Protection Program, Medical Surveillance Requirements, an Injury and Illness Program, asbestos-containing building materials disposal requirements, and a Periodic [Asbestos] Surveillance Schedule. All asbestos-containing building materials and lead identified in the Asbestos/Lead Paint Management Plan shall be removed and disposed of by an EPA-Certified Asbestos Professional and EPA Lead-Safe Certified contractor, as appropriate, in accordance with all state and federal regulations.

Timing/Implementation: *Asbestos/Lead Paint Management Plan prior to demolition. Enforcement of removal practices during demolition activities*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

This Mitigated Negative Declaration meets the requirements of the California Environmental Quality Act. I hereby recommend approval:

_____ _____

Chris Browder
Deputy Chief, Environmental Protection
CAL FIRE

Date

Pursuant to Section 21082.1 of the California Environmental Quality Act, CAL FIRE has independently reviewed and analyzed the Initial Study and Mitigated Negative Declaration for the Proposed Project and finds that the Initial Study and Mitigated Negative Declaration reflect the independent judgment of CAL FIRE. The lead agency further finds that the project mitigation will be implemented as stated in the Mitigated Negative Declaration.

I hereby approve this Mitigated Negative Declaration:

_____ _____

Duane Shintaku Date
Deputy Director, Resource Management
CAL FIRE

[To be signed upon approval of the proposed project after the public review period is complete]

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ACRONYMS AND ABBREVIATIONS

AADT	Annual Average Daily Traffic
AAQS	ambient air quality standards
AB	Assembly Bill
AQAP	air quality attainment plan
A-2	Agricultural/Valley District
BO	Biological Opinion
BMP	best management practice
BRA	Biological Resources Assessment
CalEEMod	California Emissions Estimator Model
CAL FIRE	California Department of Forestry and Fire Protection
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CH_4	methane
CHP	California Highway Patrol
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
CRHR	California Register of Historical Resources
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
DOA	Caltrans Division of Aeronautics
DOC	California Department of Conservation
DPM	diesel particulate matter
DTSC	California Department of Toxic Substances Control
DWR	Department of Water Resources
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
GHG	greenhouse gas
GWP	global warming potential
HDM	Highway Design Manual
in/sec	inches per second
L_{dn}	day/night average level (noise)
LEED	Leadership in Energy and Environmental Design
L_{max}	maximum level (noise)
LOS	level of service
LRA	local responsibility area
MBTA	Migratory Bird Treaty Act
MLD	Most Likely Descendant

MND	Mitigated Negative Declaration
msl	mean sea level
NAHC	Native American Heritage Commission
NCCAB	North Central Coast Air Basin
ND	Negative Declaration
NMFS	National Marine Fisheries Service
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSVAB	Northern Sacramento Valley Air Basin
NSVPA	North Sacramento Valley Planning Area
N_2O	nitrous oxide
PM	particulate matter
ppd	pounds per day
ppv	peak particle velocity
PRC	Public Resources Code
ROG	reactive organic gases
lbs/day	pounds per day
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SF_6	sulfur hexafluoride
SHP	State Heliport Permit
SIP	State Implementation Plan
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control and Countermeasure
SR	State Route
SRA	state responsibility area
SWPPP	stormwater pollution prevention plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TCAPCD	Tehama County Air Pollution Control District
TCPRD	Tehama County Parks and Recreation Department
TCR	Transportation Concept Report
UCMP	University of California Museum of Paleontology
USACE	US Army Corps of Engineers
USC	United States Code
USDA	US Department of Agriculture
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey

SECTION 1. BACKGROUND

1.1 Summary

Project Title:	CAL FIRE Vina Helitack Base Replacement Project
Lead Agency Name and Address:	California Department of Forestry and Fire Protection (CAL FIRE) Resource Management – Environmental Protection Program P.O. Box 944246 Sacramento, CA 94244
Contact Person and Phone Number:	Stephanie Coleman, Senior Environmental Planner California Department of General Services RESD-PMDB Energy and Environmental, MS 504 707 3rd Street, 4th Floor West Sacramento, CA 95605 Phone: (916) 376-1602 Email: Stephanie.Coleman@dgs.ca.gov
Project Location:	4520 Hwy 99 E, Vina, California. Southeast of the intersection of State Route 99 and South Avenue in Tehama County. APN: 079-050-14
General Plan Designation:	Valley Floor Agriculture (Tehama County)
Zoning:	A-2 (Agricultural/Valley District) (Tehama County)
Project Description:	Replacement and expansion of the existing CAL FIRE Vina Helitack Base

1.2 Introduction

The State of California Department of Forestry and Fire Protection (CAL FIRE) is the lead agency for this Initial Study. The Initial Study has been prepared to identify and assess the anticipated environmental impacts of the Vina Helitack Base Replacement Project. This document has been prepared to satisfy the California Environmental Quality Act (CEQA) (Public Resources Code [PRC] Section 21000 et seq.) and the State CEQA Guidelines (14 California Code of Regulations [CCR] 15000 et seq.). CEQA requires that all state and local government agencies consider the environmental consequences of projects over which they have discretionary authority before acting on those projects. A CEQA Initial Study is generally used to determine which CEQA document is appropriate for a project (Negative Declaration [ND], Mitigated Negative Declaration [MND], or Environmental Impact Report [EIR]).

1.3 Surrounding Land Uses/Environmental Setting

Project Location

The Proposed Project would be located in Northern California adjacent to State Route (SR) 99. The 7.4-acre site is approximately 25 miles southeast of the City of Red Bluff and 18 miles northwest of the City of Chico, near the unincorporated community of Vina in Tehama County. Refer to Figures 1 and 2 for Project vicinity and location. The Project site is in Section 18, T24N, R1W and the off-site

improvements are located in Sections 13, 18 and 19, T24N, R1W and R2W of the Mount Diablo Base Meridian on the Public Land Survey System and is also identified within the Vina, California, United States Geological Survey (USGS) 7.5-minute topographic map.

Local Environment

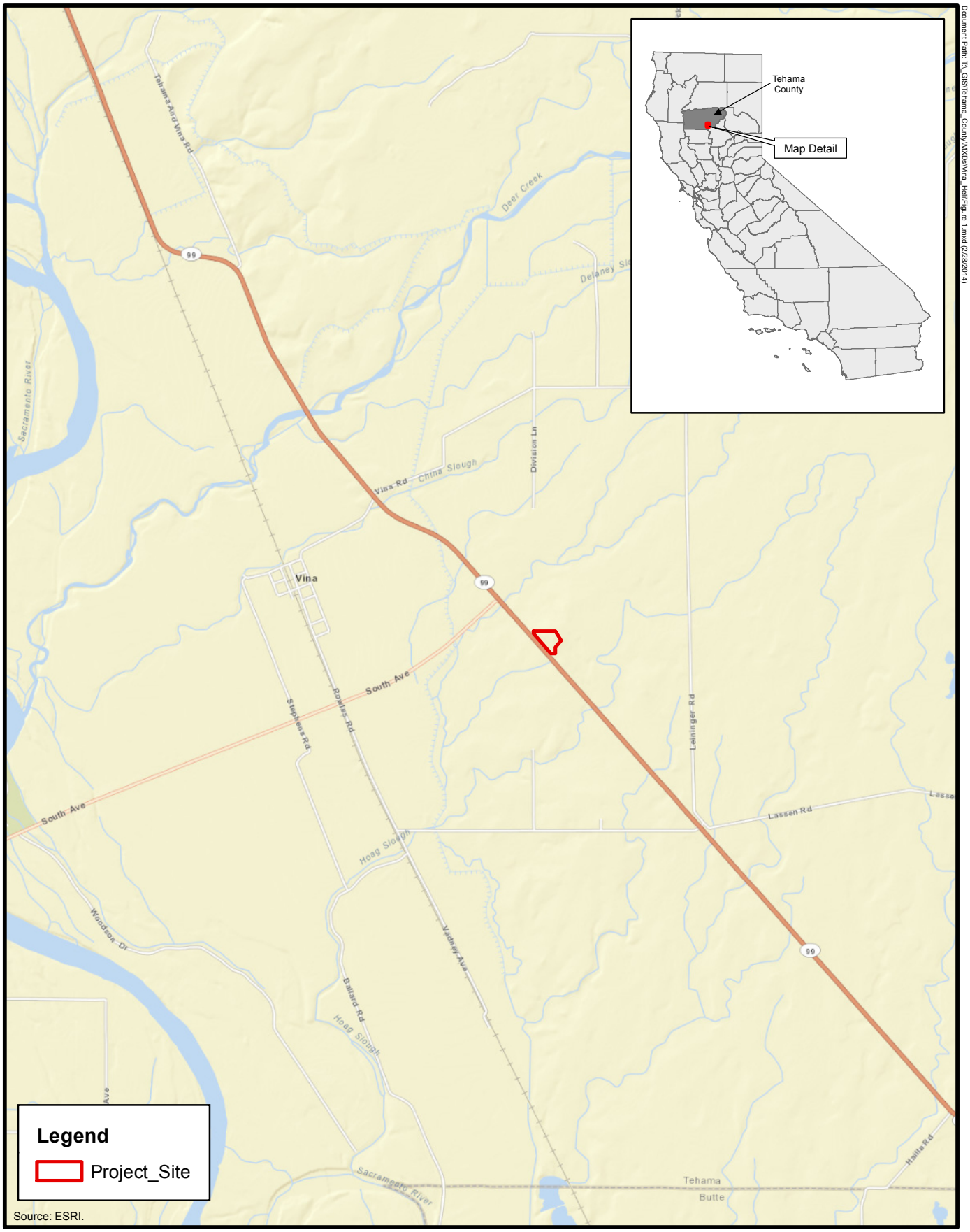
The regional climate is generally dry with warm days and cool nights, with the average July temperature range between 61 and 94 degrees Fahrenheit and a December average of between 51 and 35 degrees Fahrenheit. The elevation at the Project site is approximately 250 feet above sea level. The Project site sits on the eastern side of the Vina Plains. The Vina Plains are a naturally occurring annual grassland and vernal pool complex located in northern Butte and southern Tehama counties located on the upper terrace of the Sacramento Valley floor. The Project site is a small, isolated, naturally occurring hill slightly elevated above the surrounding vernal pool and grassland plateau (see Representative Site Photos 1 and 2).

Agricultural operations including orchards, livestock grazing, and ranching are the primary land use in the region. Generally speaking, the land uses west of the Project site are typified by orchard and tree crops and the land uses east of the Project site are ranch and grazing land. Various rural residential dwellings and outbuildings are located in the regional vicinity of the Project site.

Existing and Surrounding Land Uses

The Project site is designated by Tehama County with the Valley Floor Agriculture land use designation on the General Plan Land Use Map and has a zoning designation of A-2 (Agricultural/Valley District). The Project site abuts SR 99 to the west and undeveloped pastureland/rangeland to the east, south, and north. Existing orchard/agricultural uses are approximately 0.5 mile to the west and north of the Project site.

State Route 99, a two-lane regional state highway, is located adjacent to the Project site on the west (see Representative Site Photos 1 and 2). The nearest residence is located approximately 0.5 mile to the southeast of the Project site on Tecate Road. Another residence is located approximately 0.75 mile to the north. The nearest community is Vina, approximately 1.3 miles northwest of the Project site. The nearest roadway intersection of significance is the intersection of SR 99 and South Avenue, which is located approximately 0.25 mile to the north. Representative Site Photos 3 and 4 show the existing site improvements.



Source: ESRI.

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Miles

Figure 1
Regional Vicinity

PMC®

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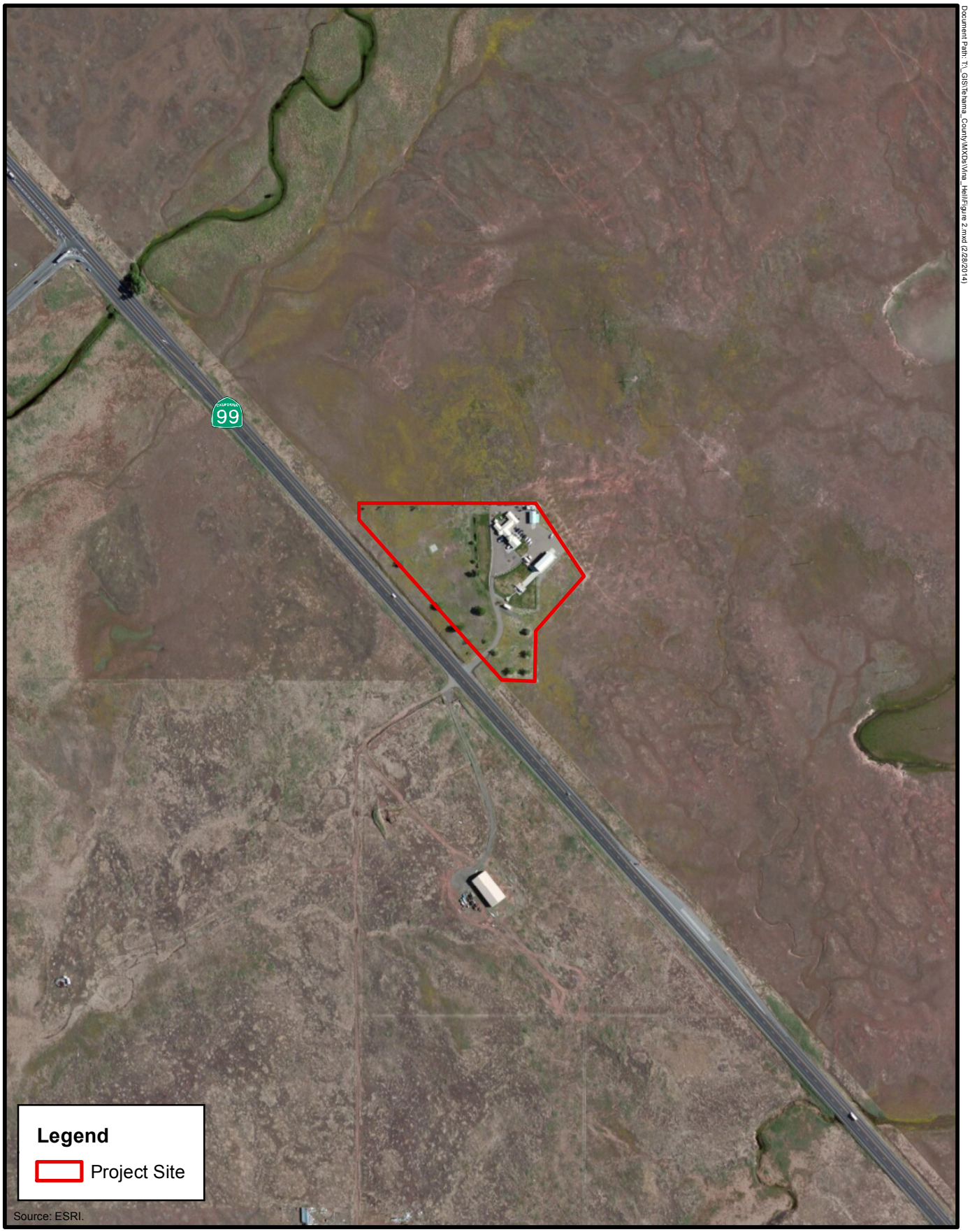

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Figure 2

Project Location

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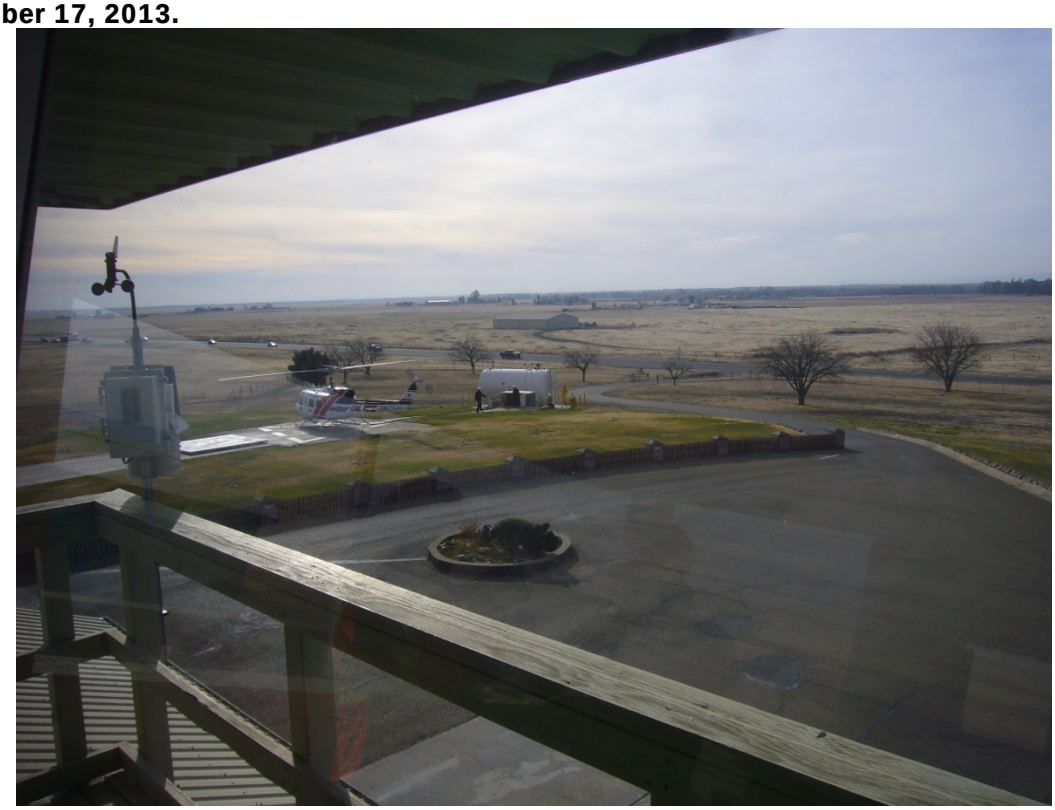
Representative Site Photo 1. Overview of Project site from observation tower, view west, December 17, 2013.



Representative Site Photo 2. Overview of Project site from observation tower, view south, December 17, 2013.

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Representative Site Photo 3. Existing Buildings on the Project site, view north, December 17, 2013.

Representative Site Photo 4. Existing Barracks/Administration Building, view east, December 17, 2013.

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SECTION 2. PROJECT DESCRIPTION

2.1 Project Background

The Vina Helitack Base originally began operation in 1955 as a single-engine fire station staffed with a CAL FIRE engine. A second engine was added to the facility by the Tehama County Fire Department shortly after the station became operational. In 1974, CAL FIRE constructed the helitack base at the site, which replaced the CAL FIRE engine and engine staff with the helicopter. A County fire engine remained at the site until 1980. Currently, the facility serves an area for initial attack of around 2.5 million acres. The primary response area is a diverse blend of grassland, oak woodland, brush, and timber covering Tehama and Glenn counties, most of Butte County, and part of Shasta County. In addition, the Vina base responds into portions of the Lassen, Plumas, Trinity, and Mendocino National Forests (CAL FIRE 2007b).

Information provided by CAL FIRE for this document indicates that the equipment and staff of the Vina base respond to all manner of emergency situations including initial attack fire response, medevac operations, short-haul rescues, emergency medical aid, and many other types of emergency incidents. Normal daily staffing at the location generally consists of one pilot, two fire Captains, and six firefighters (CAL FIRE 2007b). However, staffing fluctuates seasonally and would both increase and decrease periodically, depending on the season, the number and magnitude of regional fire events, and the overall volume of event responses in the area. On average, the Vina station responds to over 170 incidents a year, with a typical peak fire season period generating 20 to 30 fire event responses per month. These events would involve all or a portion of the equipment and resources at the facility including the helicopter, helitender, attach engine, and utility van (crew buggy). During the non-fire season, responses drop significantly to approximately one fire and one rescue/medical aid per month. In addition to responding to emergency service calls, the facility is open to the public for the purposes of obtaining burn permits and tag and license validations, and providing public information.

The current aviation program at the site consists of the operation of a UH-1H Super Huey helicopter used for fast initial attacks on wildfires (see Representative Site Photo 2). It is one of nine such CAL FIRE helicopters available statewide.

The current facility has both structural and operational deficiencies that necessitate the need to replace the facility. The existing facility is almost 40 years old and no longer meets CAL FIRE's full operational and facility needs.

2.2 Project Objectives

The objective of the Project would be to replace the facility via the construction of a new, modern helitack facility that would allow the base to continue to provide high quality fire protection and emergency response service within the State Responsibility Area (SRA) and that would accommodate the changing aviation and event-response parameters of the facility.

2.3 Project Characteristics

The Proposed Project would involve the replacement and expansion of the existing CAL FIRE Vina Helitack Base complex. The Project would include the demolition and new construction of several elements. The improvements would include the following:

- 22-bed barracks building
- three-bay apparatus building
- generator/pump/storage building
- five-blade helicopter hangar (to occur at a later date but included as a part of this environmental analysis)
- reconstructed primary helipad and a new secondary helipad
- relocated helicopter fueling infrastructure
- training tower apparatus
- construction of a new southbound deceleration and acceleration lane, reconstruction of the northbound lane configuration to accommodate the new lane on State Route (SR) 99, new driveway approach apron, and new roadway drainage infrastructure

The new buildings would be designed to meet the State of California-DGS Tier 1 Energy and Sustainability lists. Tier 2 items would be considered in the design and implemented if cost effective. In addition, the buildings would be designed to meet the US Green Building Council's Leadership in Energy and Environmental Design (LEED) requirements to attain a Silver rating.

In addition to the improvements described above, the Project would include the additional components discussed below.

<u>On-Site</u>

- Demolition of the existing barracks/administration building, demolition of the existing two-bay apparatus building, demolition of the existing storage building, demolition of the existing septic system. Demolition of perimeter and helicopter pad fence, helicopter pad, miscellaneous pavements, and rock retaining wall. Removal of fuel vault and demolition of pad, removal of jet fuel tank and pumps, demolition of utilities propane tanks and service, and removal/demolition of one tree. Demolition of the existing helicopter hangar would occur at a later date but is included as part of this environmental analysis. See Representative Site Photos 3 and 4.
- Construction of new improvements consisting of site grading, paving for road and parking areas, water supply, storage and distribution systems, wastewater disposal systems, drainage systems, and erosion control measures.
- Construction of a new paved driveway/access way around the southern portion of the Project site.
- A new 60-foot-long by 6-foot-wide hose wash rack.
- Two new aboveground water storage tanks (10,000 gallons for domestic water use and 20,000 gallons for fire suppression) and concrete support slabs.
- Installations of a new ±500-foot-deep domestic water supply well, well support improvements including a new water filtration system, and domestic and fire water distribution systems.

- Two new 1,000-gallon propane tanks, concrete support pads, and underground gas distribution system.
- A new 12,000-gallon aboveground jet fuel tank, concrete support slab, and a fuel dispensing system.
- A new 2,000-gallon self-contained aboveground fuel tank with dispensing stations and concrete support slab. Tanks would be internally divided to provide 1,000 gallons of diesel and 500 gallons of gasoline.
- A new standard septic system consisting of an approximately 600-foot leach field, a 1,500-gallon septic tank (minimum), and a 600-foot, 6-inch gravity main; or other appropriate system.
- A new stormwater collection system consisting of approximately 300 feet of 12-inch underground storm drain; four drain inlets; 500-foot 6-inch drain connecting building downspouts; and surface water swales to existing drainage systems.
- A new 30-foot-tall radio tower and foundation.
- A new auxiliary/secondary improved helicopter landing pad
- A new freestanding wood and steel-framed training tower, complete with steel stairway, non-slip deck, railings, and an aircraft fuselage.
- New site lighting throughout, including helipad lighting, approach slope indicator lighting system, flag pole, and road identification sign lighting.
- New site landscaping and irrigation system.
- New fire sprinkler system in the existing helicopter hangar building.
- New perimeter fencing: approximately 2,000 feet of 6-foot-tall chain-link fencing.
- New automatic gate controlling access to the site.
- New flag pole with in-ground mounted light.
- New underground electrical and telephone distribution systems.
- New solar power system including photovoltaic solar panels.
- New CAL FIRE station sign and platform.

<u>Off-Site</u>

- Widening of SR 99 to allow for new left turn lane into Project site and a merging lane out of the Project site going south on SR 99. This would also involve the shifting of the existing northbound travel lane requiring the need for additional pavement and a new gravel shoulder on the northbound side of the roadway (east side of the existing roadway).The roadside ditches would also be realigned with the new road shoulder.

The Proposed Project site plan is depicted in Figure 3. Building schematic and design models are shown in Figures 4a and 4b. Proposed improvements to SR 99 are depicted in Figure 5.

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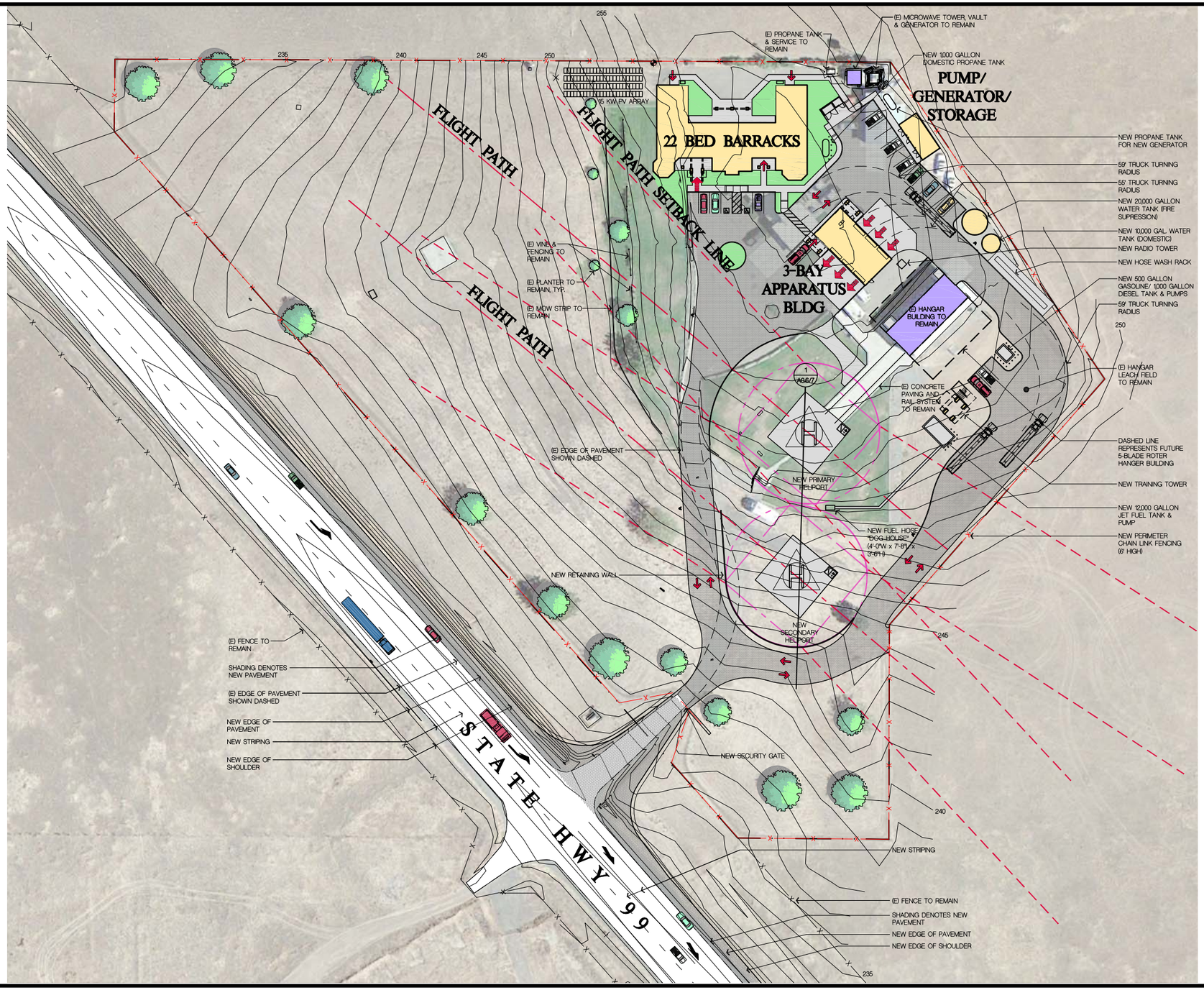

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PARKING ANALYSIS

TYPICAL PARKING STALL SIZE: 9'-6" x 18'-0", U.N.O.

NUMBER OF SPACES
25 SPACES

NUMBER OF ACCESSIBLE SPACES REQUIRED
PRE CBC TABLE 11B-208.2
1 SPACE REQUIRED (1 VAN ACCESSIBLE)
2 SPACES PROVIDED (1 VAN ACCESSIBLE)

SITE DATA

SITE AREA = 320,370 S.F. (7.4 ACRES)

BUILDING AREA = 6,700 + 1999 + 648 +1992
11,339 TOTAL S.F.

FLOOR AREA RATIO = 11,339 S.F. / 320,370 S.F. = 0.04

LANDSCAPED AREA = SEE LANDSCAPE PLANS

LEGEND

NEW CONCRETE PAVING

NEW A.C. PAVING

EXISTING TREE TO REMAIN

0 80 160
FEET

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Figure 3
Site Plan

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Source: N M & R

Figure 4a Building Schematic Design Model

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Source: N M & R

Figure 4b Building Schematic Design Model

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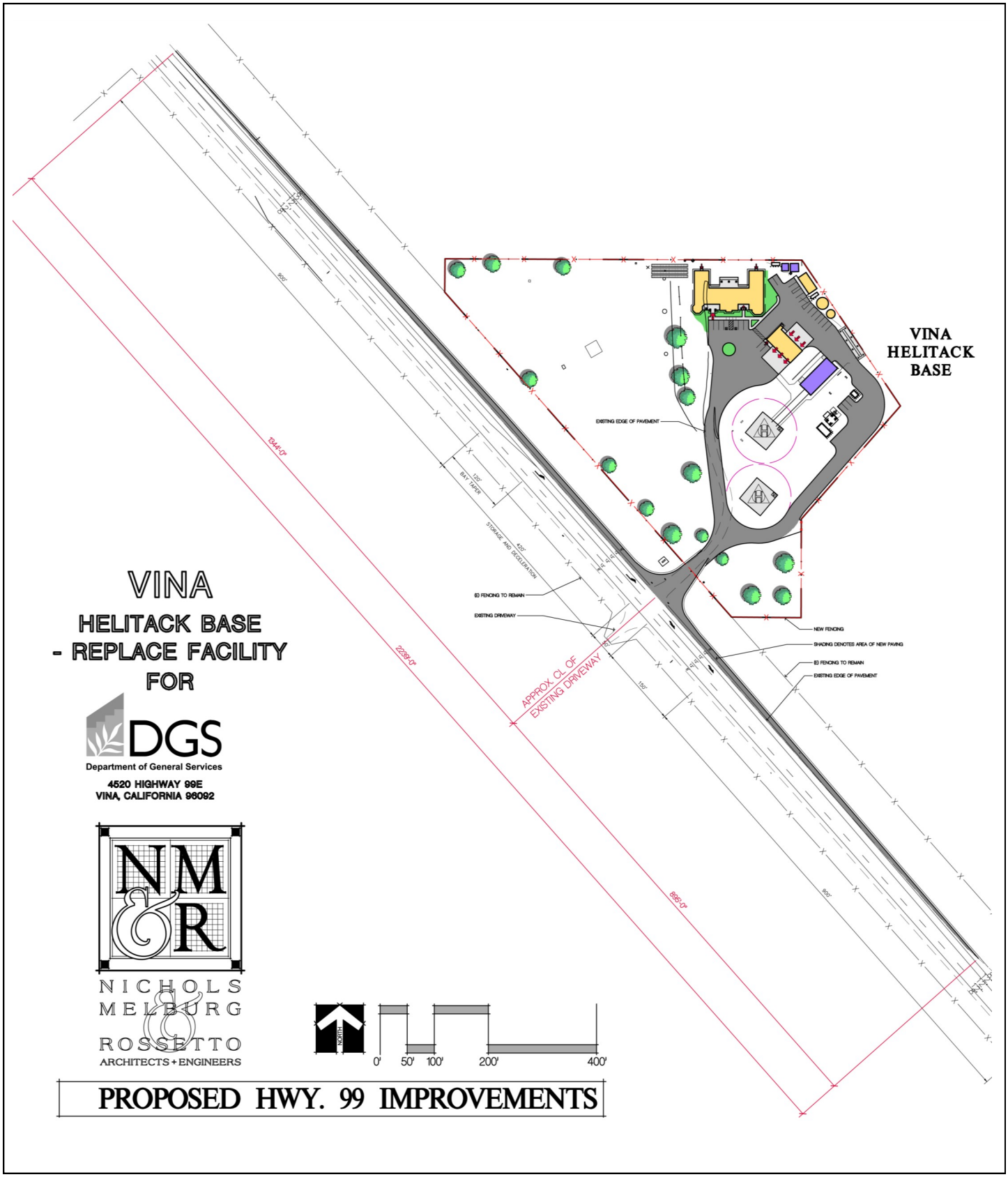

Figure 5. Proposed Hwy 99 Improvements

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2.4 Operations and Maintenance

During the peak fire season period, the typical daily facility crew is comprised of two fire captains, one fire apparatus engineer, six firefighters, and one helicopter pilot. During the non-peak fire season, daily staffing totals four personnel, generally consisting of a fire captain, two firefighters, and one pilot. During a maximum fire event, staffing could include up to 20 overnight personnel (including existing base personnel), 40 day-time personnel including up to five general staff personnel, five engine strike team personnel, two water-tender operators, one bulldozer operator, and seven Type II helicopter pilots. Table 2-1 provides a list of vehicles that could be located at the facility under normal operating conditions and maximum fire event conditions.

Table 2-1 Facility Vehicle Loading

Vehicle Type	Normal Operations	Maximum Fire Event Operations
Battalion chief vehicle (pickup truck)	—	3
Forester's vehicle (pickup truck)	—	1
Utility pickup truck	—	7
Utility van (crew buggies)	1	2
Type III fire engines	—	25
Type II helicopter	1	7
Helitender	1	2
Dozer and transport	—	1
Dozer tender	—	1
Water tenders	—	2
Additional private vehicles	—	5

Aviation operations after the Project is complete are anticipated to involve 350 to 450 hours of total annual flight time for the helicopter operations. This time would be split between actual fire events and training flights, with the majority of the overall hours dedicated to fire event response activities. Table 2-2 provides the actual helicopter operations activities between January 1, 2013, and December 12, 2013.

Table 2-2
Aircraft Operations
(1/13/2013 to 12/13/2013)

Operation	Hours	Item
Fires	284.8	
Water Drops	126.5	598,230 gallons
Passenger (PAX)	16	425 count
Reconnaissance	6	31 count
Cargo Delivery	2.1	2,200 pounds
Maintenance	15.6	
Medical/rescue	6.6	
Training	78.3	
Other	12.4	
Total Hours	**397.7**	

2.5 Project Timing

Project construction is anticipated to start in the off-fire season, fall of 2015 and be completed within a year to a year and a half. Construction activities would start when Project funding has been fully secured and all construction contracts have been put in place.

If unanticipated delays related to funding or facility planning occur, CAL FIRE would carefully reassess the CEQA document prior to construction to determine whether any new environmental review actions would be required to ensure compliance.

2.6 Regulatory Requirements, Permits, and Approvals

This Initial Study provides the environmental information and analysis and primary CEQA documentation necessary for CAL FIRE to adequately consider the effects of the Proposed Project. CAL FIRE, as the lead agency, has the approval authority and responsibility for considering the environmental consequences of the Proposed Project.

Approvals and/or permits needed to implement the Proposed Project are listed in Table 2-3.

Table 2-3
Approvals and/or Permits Required

Organization or Issue	Approval or Permit
US Army Corps of Engineers (USACE)	Section 404 Permits
Central Valley Regional Water Quality Control Board (RWQCB)	Section 401 Permit
USF&WS	Section 7 consultation
State Water Resources Control Board (SWRCB)	Construction General Permit (including the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), and best management practices
Caltrans	Encroachment Permit for roadway improvements
Caltrans – Division of Aeronautics	State Heliport Permit
Tehama County* (Engineer and Public Works)	Grading plan, well drilling permit, and on-site waste disposal permit
Tehama County Certified Unified Program Agency (CUPA)	Permits associated with storage and use of Jet A, diesel and gasoline, oils and lubricants, and specialty fire suppression liquids, and tanks. Spill Prevention, Control and Countermeasure (SPCC) Plan must be filed and be stamped by a registered civil engineer, since there would be more than 10,000 gallons of petroleum products stored on-site. Hazardous Materials Business Response Plan and Hazardous Waste Inventory
CAL FIRE Aviation	Permits or approvals associated with aviation activities on the site.
Tehama County Air Pollution Control District	Air permit (for the generator), Authority to Construct Permit, and asbestos/lead-based paint removal coordination.
State Fire Marshal; State Architect	Approval for Americans with Disabilities Act, structural review, and fire suppression and code compliance review.

* The Proposed Project would be located on State-owned property and would remain a State-owned and operated facility. As such, the property would not be within permitting jurisdiction of Tehama County and permits for planning and building activities are not required.

CAL FIRE will consult with Tehama County to seek Tehama County's expertise and guidance pertaining to encroachment, grading, and wastewater system installation to ensure standards utilized for this Project are consistent with the County's guidelines and standards.

SECTION 3. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED AND DETERMINATION

Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Greenhouse Gas Emissions	☐ Population and Housing
☐ Agriculture and Forestry Resources	☒ Hazards/Hazardous Materials	☐ Public Services
☒ Air Quality	☐ Hydrology/Water Quality	☐ Recreation
☒ Biological Resources	☐ Land Use and Planning	☐ Transportation/Traffic
☒ Cultural Resources	☐ Mineral Resources	☐ Utilities and Service Systems
☐ Geology and Soils	☐ Noise	☐ Mandatory Findings of Significance

Determination

On the basis of this initial evaluation:

I find that the Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared. ☐

I find that although the Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared. ☒

I find that the Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required. ☐

I find that the Project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed. ☐

I find that although the Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the Project, nothing further is required. ☐

Duane Shintaku
Deputy Director, Resource Management
CAL FIRE

8/1/14
Date

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SECTION 4. ENVIRONMENTAL CHECKLIST AND DISCUSSION

4.1 Aesthetics

4.1.1 Environmental Setting

Regional Setting

The Project is located in Tehama County, adjacent to State Route (SR) 99. The 7.4-acre site is approximately 25 miles southeast of the City of Red Bluff and 18 miles northwest of the City of Chico, near the unincorporated community of Vina. The topography of Tehama County is made up of extremes, from the low land of the Central Valley traversed by the Sacramento River to the mountains of the Pacific Coast and the Cascade Mountain Ranges. The county can generally be described as three geographical parts. The eastern one-third of the county consists of the Cascade Mountains and foothills, the western third consists of the Pacific Coast Range and foothills, and the center third consists of the Northern Sacramento River Valley floor area. Agricultural lands are located in the valley floor and in the foothill area. Large portions of both the eastern and western portions of the county are public lands (e.g., National Forests, National Park Service, Bureau of Land Management), with the majority of the valley floor area being private land.

Visual Setting

The county has a broad range of landscapes that change with the gradual increase in elevation. Elevations range from the fertile floor of the Sacramento River Valley (elevation at Red Bluff is 341 feet) to more than 8,200 feet in the southern Cascades. The diverse environments of the region are represented by distinct natural communities and landforms, which display different development patterns and historical features.

Rolling hills dotted with mature oaks and oak woodlands, agricultural fields, orchards, evergreen forests and snow-capped mountains, scenic rivers and lakes, and historic structures all contribute to the visual character found in the county.

Visual Character of the Project Site

The Project site is located in an area of large vacant expanses of land to the east, north, and south, which are generally used for cattle grazing, with the Cascades in the distance. West of the Project site is SR 99 with vacant land adjacent to the highway to the west, agricultural land used as orchards beyond, and a scattering of single-family homes. The existing helitack base is located on a prominent knoll about 27 feet in height and is surrounded by vacant undeveloped land. Current uses include a barracks/administration building, a two-bay apparatus building, a storage building, and other attributes typical of a helitack base.

4.1.2 Aesthetics (I.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Would the project have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒

The Project is the redevelopment of an existing use for the same purpose. The nearest residence is located approximately 0.5 mile to the southeast of the Project site on Tecate Road. Another residence is located approximately 0.75 mile to the north. The nearest community is Vina, approximately 1.3 miles northwest of the Project site. There are no designated Federal, State or local scenic vistas that can be viewed from the site. Redevelopment of the Project site for the same purpose would not change the existing views and would not result in a substantial adverse effect on a scenic vista. No impact would occur.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
b)	Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒

The California Scenic Highway Program protects and enhances the scenic beauty of California's highways and adjacent corridors. A highway can be designated as scenic based on how much natural beauty can be seen by users of the highway, the quality of the scenic landscape, and if development affects the enjoyment of the view (Caltrans 2014).

The Project site is not located in the vicinity of a state designated scenic highway. No impact would occur.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
c)	Would the project substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒

The Project is the redevelopment of an existing use for the same purpose. The nearest residence is located approximately 0.5 mile to the southeast of the Project site. The nearest community is Vina, approximately 1.3 miles northwest of the Project. Redevelopment of the Project site for the same purpose would not change the existing visual character and would not result in the substantial visual degradation of the site or surroundings. No impact would occur.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
d)	Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

The Project is the redevelopment of and existing use for the same purpose. This redevelopment would include new site lighting throughout, including helipad lighting, an approach slope indicator lighting system, and flag pole and road identification sign lighting. All exterior lighting would be low brightness, sharp cutoff, no-spill light with no uplighting in order to diminish the potential for night lighting impacts. The buildings would be constructed using non-reflective material such as timber, painted fiber-cement siding, and composition roofing. The buildings would not include large expanses of windows. All of these attributes would reduce the potential for daytime glare. Because the Project is the redevelopment of an existing use, and the new uses would include improvements that would reduce the potential for light and glare, the Project would have a less than significant impact.

4.2 Agriculture and Forestry Resources

4.2.1 Environmental Setting

The Project site is located in an area characterized by grasslands, marshes, vernal pools, riparian and valley oak woodlands. The area immediately surrounding the Project site is classified as Grazing Land by the Department of Conservation (DOC), with vast areas to the north and west classified as Prime Farmland or Farmland of Statewide Importance (DOC 2014). The site is classified as Grazing Land.

The DOC has classified Important Farmland in Tehama County by the following categories:

- *Prime Farmland* – Farmland with the best combination of physical and chemical features able to sustain long-term production of agricultural crops.
- *Farmland of Statewide Importance* – Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or with less ability to hold and store moisture.
- *Unique Farmland* – Farmland of lesser quality soils used for the production of the state's leading agricultural crops.
- *Farmland of Local Importance* – Land of importance to the local agricultural economy, as determined by each county's board of supervisors and a local advisory committee.
- *Grazing Land* – Land on which the existing vegetation is suited to the grazing of livestock.
- *Urban and Built-up Land* – Land occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures to a 10-acre parcel.
- *Other Land* – Land not included in any other mapping category is included as other land. Common examples include low-density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry, or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is also mapped as Other Land.

The Project site is also adjacent to the Vina Plains Preserve. The Vina Plains Preserve is a 4,600-acre preserve owned by The Nature Conservancy and is managed as a demonstration cattle ranch. This

preserve is managed for dual purposes—livestock and endangered species. The goal is to manage noxious weeds and native species by livestock grazing.

4.2.2 Agriculture and Forestry Resources (II.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?	☐	☐	☐	☒

The Project site is not used for agricultural purposes, nor is the site located adjacent to areas of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. While the Project would include the construction of new buildings and an expansion of existing uses, these uses would not result in the conversion of farmland. No impact would occur.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
b)	Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒

The Project is located on State-owned land and therefore is not under the jurisdiction of the local zoning authority (Tehama County). The land adjacent to the Project site is designated as Valley Floor Agriculture in the Tehama County General Plan and zoned as Agricultural/Valley District (A-2). The surrounding land is located within the Vina Plains Preserve, which is used for a demonstration cattle ranch. While the Project site is located adjacent to land zoned for agricultural uses, the Project would redevelop an existing site with the same use. As such, the Proposed Project would not affect the surrounding agricultural uses. Additionally, according to the Tehama County General Plan Draft EIR Figure 4.2-1 (2008), there are no surrounding properties under Williamson Act contracts adjacent to the site. No impact would occur.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
c)	Would the project conflict with existing zoning for, or cause rezoning of, forestland (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒

The Project site is not located in an area considered to be forestland or timberland. No impact would occur.

d) Would the project result in the loss of forestland or conversion of forestland to non-forest use?	Potentially Significant Impact ☐	Less Than Significant Impact with Mitigation Incorporated ☐	Less Than Significant Impact ☐	No Impact ☒

The Project site is not located in an area considered to be forestland or timberland. No impact would occur.

e) Would the project involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to nonagricultural use or conversion of forestland to non-forest use?	Potentially Significant Impact ☐	Less Than Significant Impact with Mitigation Incorporated ☐	Less Than Significant Impact ☐	No Impact ☒

As previously stated, the Proposed Project is the redevelopment of an existing use for the same purpose. Development of the Proposed Project would not involve changes in the current uses that would result in conversion or farmland or forestland to other uses. The Project site is not located in an area considered to be forestland or timberland. No impact would occur.

4.3 Air Quality

4.3.1 Environmental Setting

The Project area is located within the Sacramento Valley. The Sacramento Valley is located between two mountain ranges to the east and the west, and is bordered at its northern end by more mountains. This topography is conducive to trapping air pollutants. The problem is exacerbated by a temperature inversion layer that traps air at lower levels below an overlying layer of warmer air. Prevailing winds in the area are from the south and southwest. Sea breezes flow over the San Francisco Bay Area and into the Sacramento Valley, transporting pollutants from the large urban areas. Tehama County is located in the Northern Sacramento Valley Air Basin (NSVAB), which also includes Shasta, Glenn, Butte, Colusa, Sutter, and Yuba counties.

Both the US Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have established ambient air quality standards for common pollutants. These ambient air quality standards are levels of contaminants representing safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called “criteria” pollutants because the health and other effects of each pollutant are described in criteria documents. The six criteria pollutants are ozone, carbon monoxide (CO), particulate matter (PM), nitrogen oxides (NO_x), sulfur dioxide (SO_2), and lead. Areas that meet ambient air quality standards are classified as attainment areas, while areas that do not meet these standards are classified as nonattainment areas. Tehama County has been designated an attainment or unclassified (data insufficient to support any designation) area for all federal ambient air quality standards (CARB 2013). However, the county is designated a nonattainment area for state ozone and particulate matter less than 10 microns (PM_{10}) standards (CARB 2013). As shown in Table 4.3-1, the county is designated an attainment or unclassified area for all other state ambient air quality standards (CARB 2013).

Table 4.3-1
Federal and State Ambient Air Quality Attainment Status for Tehama County

Pollutant	Federal	State
1-hour Ozone (O_3)	—	Nonattainment
8-hour Ozone (O_3)	Unclassified/Attainment	Nonattainment
Coarse Particulate Matter (PM_{10})	Unclassified	Nonattainment
Fine Particulate Matter ($PM_{2.5}$)	Unclassified/Attainment	Unclassified
Carbon Monoxide (CO)	Unclassified/Attainment	Unclassified
Nitrogen Dioxide (NO_2)	Unclassified/Attainment	Attainment
Sulfur Dioxide (SO_2)	Unclassified	Attainment
Lead	Unclassified/Attainment	Attainment

Source: CARB 2013

Regulatory Framework

Local Air Quality Management

In Tehama County, the air quality regulating authority is the Tehama County Air Pollution Control District (TCAPCD). The TCAPCD monitors air quality in the county and serves as the lead agency responsible for implementing and enforcing federal, state, and Tehama County air quality regulations. Air pollution sources in the county include seasonal burning of agricultural fields, dust from agricultural operations, and motor vehicle emissions.

The TCAPCD has established thresholds under CEQA for the assessment of air quality impacts. These thresholds of significance are summarized in Table 4.3-2.

Table 4.3-2
Tehama County AQMD Thresholds of Significance

Threshold	Emissions (lbs/day)		
	NO_X	ROG	PM_{10}
Level "A" Thresholds	25	25	80
Level "B" Thresholds	137	137	137

If a project has emissions that are less than the Level A thresholds, only feasible standard mitigation measures (SMMs) are required. If a project has emissions that exceed the Level A thresholds, the project applicant must apply all feasible mitigation measures for construction and/or operation from the lists of recommended SMMs and appropriate best available mitigation measures (BAMMs) as determined by the county.

If a project has emissions that exceed the Level B thresholds, the project applicant must apply special BAMMs, in addition to the required SMMs and BAAMs. If application of these procedures results in reducing a project's emissions to a level below the threshold of 137 pounds per day for ROG, NO_x, and PM_{10}, an environmental determination of a Mitigated Negative Declaration can be made, assuming other project impacts do not require more extensive environmental review. If however, project emissions are still in excess of the Level B category, project emissions are considered to be significant and emissions offsets are required.

4.3.2 Air Quality (III.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒

As part of its enforcement responsibilities, the EPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs. Similarly, under state law, the California Clean Air Act requires an air quality attainment plan (AQAP) to be prepared for areas designated as nonattainment with regard to the federal and state ambient air quality standards. Air quality attainment plans outline emissions limits and control measures to achieve and maintain these standards by the earliest practical date.

The North Sacramento Valley Planning Area (NSVPA) 2012 Air Quality Attainment Plan is the most recent air quality planning document covering Tehama County and constitutes the region's SIP (Sacramento Valley Basinwide Air Pollution Control Council 2013). SIPs are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, and permitting), district rules, state regulations, and federal controls describing how the state will attain ambient air quality standards for ozone and particulate matter. State law makes CARB the lead agency for all purposes related to the SIP. Local air districts prepare SIP elements and submit them to CARB for review and approval. The NSVPA 2012 Air Quality Attainment Plan includes forecast reactive organic gases (ROG) and nitrogen oxides (NO_x) emissions (ozone precursors) for the entire NSVPA region through the year 2020. These emissions are not appropriated by county or municipality.

The consistency of the Proposed Project with the NSVPA 2012 Air Quality Attainment Plan, which is also the SIP for the air basin, should be determined by both (a) the Project's consistency with population and vehicle use projections utilized by the AQAP and (b) the extent to which the Project implements AQAP transportation control measures.

While the Project would increase the intensity of the land use on the Project site, the Project would not represent a new type of land use on the site or a wholly new land use or air emissions generation source, as the Project is the modernization of an existing facility as opposed to the construction of a wholly new facility. No population growth would occur as a result of the Project. When complete, the Project would not increase existing traffic within the localized project area. The purpose and objective of this Project is to replace the facility with the construction of a new, modern helitack facility that would allow the base to continue to provide high quality fire protection and emergency response service within the state responsibility area (SRA) and that would accommodate the changing aviation and event-response parameters of the facility.

Consistency with the air quality plan is also determined if the Project includes applicable control measures in the plan and does not disrupt or hinder implementation of any control measures. As discussed in more detail below under Issue b), the Proposed Project would not result in operational-related criteria air pollutants and/or precursor emissions that would exceed TCAPCD thresholds of significance, and construction-generated criteria air pollutants would be mitigated. As described under Issue b), the Project would be required to adhere to standard fugitive dust and toxic pollutant

reduction measures during construction activities. Implementation of these basic mitigation measures during construction would ensure Project consistency with the air quality plan.

As the Project would not result in an increase in population or generate new traffic, includes feasible control measures, and would not disrupt or hinder implementation of any NSVPA Air Quality Attainment Plan control measures, no impact would occur.

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐

Implementation of the Proposed Project could result in air quality impacts during Project construction and operation.

Construction Emissions

Implementation of the Proposed Project would result in short-term emissions from construction as well as demolition activities associated with deconstruction of the existing helitack base. For purposes of this analysis, emissions from both construction and demolition of the Proposed Project will be collectively referred to as construction emissions from this point forward.

Construction-generated emissions are short term and of temporary duration, lasting only as long as construction activities occur, but have the potential to represent a significant air quality impact. Implementation of the Proposed Project would result in the temporary generation of emissions resulting from site grading and paving, motor vehicle exhaust associated with construction equipment and worker trips, and the movement of construction equipment. Emissions commonly associated with construction activities include fugitive dust from soil disturbance, fuel combustion from mobile heavy-duty diesel- and gasoline-powered equipment, portable auxiliary equipment, and worker commute trips. During construction, fugitive dust, the dominant source of PM_{10} and $PM_{2.5}$ (particulate matter smaller than 2.5 microns) emissions, is generated when wheels or blades disturb surface materials. Uncontrolled dust from construction can become a nuisance and potential health hazard to those living and working nearby. Emissions of airborne particulate matter are largely dependent on the amount of ground disturbance associated with site preparation activities. Demolition and renovation of buildings can also generate PM_{10} and $PM_{2.5}$ emissions. Off-road construction equipment is often diesel-powered and can be a substantial source of NO_X emissions, in addition to PM_{10} and $PM_{2.5}$ emissions. Worker commute trips and architectural coatings are dominant sources of ROG emissions.

The predicted maximum daily construction-generated emissions of ROG, NO_x, and particulate matter (PM_{10} and $PM_{2.5}$) associated with Project construction is summarized in Table 4.3-3. The projected criteria pollutant emissions resulting from construction activities were estimated by PMC using the California Emissions Estimator Model (CalEEMod). CalEEMod is a statewide land use emissions computer model designed to quantify potential criteria pollutant emissions associated with both construction and operations from a variety of land use projects. CalEEMod contains default values for much of the information needed to calculate emissions. However, project-specific, user-supplied information can also be used when it is available. Results of the modeling conducted by PMC are included in Appendix A.

Table 4.3-3
Project Construction Emissions (Maximum) Pounds per Day

Construction Phase	ROG	NOx	PM_{10}	$PM_{2.5}$	CO
Demolition[1]	4.50	48.36	2.87	2.34	36.07
Grading and Earthwork[2]	5.26	56.88	21.15	12.77	42.63
Building Construction and Facilities Placement[3]	4.51	42.86	3.21	2.49	25.84
Helipad Installation, Asphalt Paving, and SR 99 Improvements[4]	5.55	51.82	8.43	5.42	34.00
TCAPCD Level A/B Thresholds	**25/137**	**25/137**	**80/137**	**None**	**None**
Individual Project Areas Exceed Level A/B Thresholds?	No/No	Yes/No	No/No	NA	NA

Source: Emissions modeled by PMC using the CalEEMod computer program. See Appendix A for modeling outputs.
[1] Emissions projected from demolition account for demolition of the barracks/administration building, two-bay apparatus building, storage building, wastewater system, perimeter and helicopter pad fence, helicopter pad, pavements, rock retaining wall, utilities, propane tanks, and helicopter hangar, as well as the removal of the fuel vault and jet fuel tank and pumps.
[2] Emissions projected from grading and earthwork includes grading of the entire 7.4-acre site in order to provide a conservative analysis.
[3] Emissions projected from building construction and facilities placement include the construction of a new barracks, three-bay apparatus building, pump generator/storage building, and hangar as well as the placement of two water tanks, a hose rack, training tower, a gasoline tank, and jet fuel tank.
[4] Emissions projected from this construction phase account for the pavement of 4.5 acres, which is conservative.

It is important to note that actual daily emissions would vary from day to day and would be dependent on the activities occurring. Based on the modeling conducted, estimated short-term daily emissions of ROG, NO_x, PM_{10}, and $PM_{2.5}$ associated with construction activities would not exceed the Level B significance threshold; however, the Level A significance threshold would be surpassed for NO_x emissions. As previously stated, if a project has emissions that exceed the Level A thresholds, the project applicant must apply all feasible mitigation measures for construction from the lists of recommended SMMs and appropriate BAMMs. Mitigation Measure AQ-1 is recommended and described below to reduce the impact to a level that is considered less than significant.

Mitigation Measure

AQ-1 Construction Emissions Reduction

The California Department of Forestry and Fire Protection (CAL FIRE) shall submit to the Tehama County Air Pollution Control District and receive approval for an Emissions Reduction Plan prior to groundbreaking. The Emissions Reduction Plan shall include the measures recommended by TCAPCD, at the time of development, for the control of fugitive and mobile-source emissions associated with on-site construction activities. At the present time, these measures include, but are not limited to, the following:

A. The applicant shall be responsible for ensuring that all adequate dust control measures are implemented in a timely and effective manner during all phases of project development and construction.

B. All material excavated, stockpiled, or graded shall be sufficiently watered to prevent fugitive dust from leaving property boundaries and causing a public nuisance or a violation of an ambient air standard. Watering shall occur at least twice daily with complete site coverage, preferably in the mid-morning and after work is completed each day.

C. All areas (including unpaved roads) with vehicle traffic should be watered periodically or have dust palliatives applied for stabilization of dust emissions.

D. All on-site vehicles shall be limited to a speed of 15 miles per hour on unpaved roads.

E. All land clearing, grading, earth-moving, or excavation activities on the Project site shall be suspended when sustained winds are expected to exceed 20 miles per hour.

F. All portions of the development site that have been stripped of vegetation by construction activities and left inactive for more than ten days shall be seeded and/or watered until a suitable grass cover is established.

G. All trucks hauling dirt, sand, soil, or loose material shall be covered or shall maintain at least 2 feet of freeboard (i.e., minimum vertical distance between top of the load and the trailer) in accordance with the requirements of California Vehicle Code Section 23114. This provision shall be enforced by local law enforcement agencies.

H. All material transported off site shall be either sufficiently watered or securely covered to prevent a public nuisance.

I. Wheel washers shall be installed where project vehicles and/or equipment enter and/or exit onto paved streets from unpaved roads. Vehicles and/or equipment shall be washed prior to each trip.

J. Prior to final occupancy, the applicant shall re-establish ground cover on the construction site through seeding and watering.

K. Off-road construction equipment shall not be left idling for periods longer than 5 minutes when not in use.

Timing/Implementation:	*Approval of Emissions Reduction Plan Prior to groundbreaking. Enforcement of Plan during construction*
Monitoring/Enforcement:	*Department of Forestry and Fire Protection*

Operational Emissions

Operational air quality impacts could include emissions from Project-generated vehicle traffic and facility operations, including the use of water heaters and landscape maintenance equipment. However, these potential impacts are not substantially greater than those associated with current operations since the Proposed Project is not anticipated to increase the amount of helitack base usage over existing conditions. While the Project would increase the intensity of the land use on the project site, the Project would not represent a new type of land use on the site or a wholly new land use or air emissions generation source, as the Proposed Project is the modernization of an existing facility as opposed to the construction of a wholly new facility. The purpose and objective of this Project is to upgrade and bring the site to modern CAL FIRE occupational standards. However, because the Project would include a larger barracks, the potential for additional fire personnel living on base compared to existing conditions does exist. This larger barracks would provide 22 beds instead of the existing 12 beds and as such, an additional 10 persons could be housed on the site.

Nonetheless, the additional emissions projected from 10 extra vehicle trips are negligible (see Appendix A). Therefore, operational air quality impacts are considered less than significant.

c) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☒	☐

As noted above, Tehama County is currently in nonattainment for state ozone and PM_{10} ambient air quality standards. The TCAPCD's approach for assessing cumulative impacts is based on the 2012 Air Quality Attainment Plan forecasts of attainment of ambient air quality standards in accordance with the requirements of the federal and California Clean Air Acts. In other words, the TCAPCD considers projects that are consistent with the Air Quality Attainment Plan, which is intended to bring the basin into attainment for all criteria pollutants, to also have less than significant cumulative impacts.[1] The discussion under Issue a) demonstrates that the Proposed Project would be consistent with the 2012 Air Quality Attainment Plan. Therefore, cumulative air quality impacts are less than significant.

d) Would the project expose sensitive receptors to substantial pollutant concentrations?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☒	☐	☐

Sensitive receptors are generally defined as facilities that house or attract groups of children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Schools, hospitals, residential areas, and convalescent facilities are examples of sensitive receptors.

Toxic Air Contaminants

There are many different types of toxic air contaminants (TACs), with varying degrees of toxicity. Sources of TACs include industrial processes, such as petroleum refining and chrome plating operations, and commercial operations such as gasoline stations and dry cleaners. Mobile sources of air toxics include freeways and major roadways. These roadways are sources of diesel particulate matter (DPM), which CARB has listed as a TAC.

[1] CEQA Guidelines Section 15064(h)(3) states, "A lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program which provides specific requirements that will avoid or substantially lessen the cumulative problem (e.g., water quality control plan, air quality plan, integrated waste management plan) within the geographic area in which the project is located. Such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency."

The Proposed Project would not be a source of TACs. However, there is a potential that the Project site would be located within an area that is exposed to substantial TAC emissions. In April 2005, CARB released the Land Use and Air Quality Handbook: A Community Health Perspective, which offers guidance on siting sensitive land uses in proximity to sources of air toxics. Sensitive land uses identified in the handbook include residential communities, schools and schoolyards, day-care centers, parks and playgrounds, and hospitals and medical facilities. While the Proposed Project does not include any of these land uses, it would provide for a potential of 10 additional persons to be housed on the site.

One particular source of air toxics treated in the guidance is freeways and major roadways. The handbook recommends that sensitive land uses be sited no closer than 500 feet from a freeway or major roadway. This 500-foot buffer area was developed to protect sensitive receptors from exposure to diesel PM and was based on traffic-related studies that showed a 70 percent drop in PM concentrations at a distance of 500 feet from the roadway. Presumably, acute and chronic risks as well as lifetime cancer risk due to diesel PM exposure are lowered proportionately. The Project barracks is proposed to be located in the exact same location as the existing barracks (residential living quarters), which is approximately 450 feet from State Route (SR) 99 and within the 500-foot buffer.

As a refinement to the CARB handbook, the Sacramento Metropolitan Air Quality Management District (SMAQMD) prepared the Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways, which was updated in March 2011. This protocol sets a screening threshold (276 per million) under which potential health risk impacts are not anticipated. The screening threshold was selected by the SMAQMD as that level of increased individual risk corresponding to a 70 percent reduction from the highest risk calculated at distances from the edge of the nearest travel lane to the nearest sensitive receptor for peak-hour traffic volumes. Based on the location of the proposed barracks (approximately 450 feet northeast of SR 99 at its nearest) and the peak-hour volumes (1,050) along the nearby SR 99 segment (Caltrans 2013), the location of the Project site would not exceed the thresholds identified in the refined protocol as shown in Table 4.3-4.

Table 4.3-4
Screening Evaluation of Potential Cancer Risk to Proposed Receptors Attributable to State Route 99

State Route 99 Peak-Hour Traffic (vehicles/hr)	Receptor Distance from Edge of Nearest Travel Lane (feet)	Incremental Cancer Risk Per Million: East	Distance Screening Threshold (276 per million) Exceeded	Project Barracks Distance from State Route 99	Screening Threshold Surpassed?
1,050	10	219	At no distance is screening threshold exceeded	450 feet	**No**
	25	188			
	50	149			
	100	105			
	200	67			
	300	51			
	400	38			
	500	32			

Source: SMAQMD 2011; Peak-Hour Traffic Source: Caltrans 2013

Short-Term Construction Toxics

Although the Proposed Project could create a hazard to the CAL FIRE staff through exposure to substantial pollutant concentrations such as $PM_{2.5}$ and/or other toxic air contaminants during construction activities, these impacts are anticipated to be temporary and short term. Construction activities would involve the use of a variety of gasoline- or diesel-powered equipment that emits exhaust fumes. However, the duration of exposure would be short, and exhaust from construction equipment dissipates rapidly. Furthermore, mitigation measure AQ-1 would ensure fugitive dust (PM_{10} and $PM_{2.5}$) and equipment fume (NOx and $PM_{2.5}$) control measures are incorporated into the Project plans to reduce the emissions of fugitive dust and diesel equipment–generated air toxics during construction activities at the Project area, which would ensure workers and CAL FIRE staff in the Project area would not be exposed to these pollutants.

Construction emissions would be temporary and would be less than the significance threshold. Therefore, the Proposed Project would not expose sensitive receptors to substantial pollution concentrations. A less than significant impact would occur with the implementation of Mitigation Measure AQ-1.

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Would the project create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

The potential for the Project to generate objectionable odors has been considered. Land uses generally associated with odor complaints include agricultural uses (livestock and farming), wastewater treatment plants, food processing plants, chemical plants, composting operations, refineries, landfills, dairies, and fiberglass molding facilities.

The Project does not contain land uses typically associated with emissions of objectionable odors. Potential odor sources associated with the Proposed Project would result from construction equipment exhaust and the application of asphalt and architectural coatings during construction activities, and the temporary storage of typical solid waste (refuse) associated with the Proposed Project's (long-term operational) uses. Standard construction requirements would minimize odor impacts resulting from construction activity. It should be noted that any construction odor emissions generated would be temporary, short term, and intermittent in nature and would cease on completion of the respective phase of construction activity and are thus considered less than significant. It is expected that Project-generated refuse would be stored in covered containers and removed at regular intervals. No impact would occur.

4.4 Biological Resources

The information in this subsection is based on the Biological Resources Assessment (BRA) (Appendix B) prepared for the Proposed Project (ECORP 2014a).

4.4.1 Environmental Setting

The Vina Helitack Base complex is located in the northeastern part of the Sacramento Valley California Floristic Province. This is the wetter and cooler area of California's Great Central Valley, and the area is generally characterized by grasslands, marshes, vernal pools, riparian woodlands,

and valley oak (*Quercus lobata*) woodlands. The area features a Mediterranean climate with cool, wet winters and hot, dry summers. The hottest month is July, with an average maximum temperature of 98 degrees Fahrenheit at Red Bluff, approximately 18 miles northwest of the Project site. Annual yearly precipitation is 23.5 inches of rain, with the majority falling in November, December, and January. The elevation at the Project site is approximately 250 feet above mean sea level (msl), and the site slopes from 260 feet msl at the northeast to 235 feet msl at the edge of State Route (SR) 99. The Project site sits within the Vina Plains, which are a naturally occurring annual grassland and vernal pool complex located in northern Butte and southern Tehama counties located on the upper terrace of the Sacramento Valley floor. The Project site is an isolated, naturally occurring hill slightly elevated above the surrounding vernal pool and grassland plateau.

Land use in the region is primarily agricultural. Livestock grazing and ranching are the primary land uses immediately surrounding the site. Lands located west of the Project site are generally typified by orchard and tree crops. Rural residential dwellings and outbuildings are located in the regional vicinity of the Project site.

Vegetation Communities

Plant communities within the Project site include developed/landscaped areas with planted lawns and small ornamental trees, and annual grassland consisting of medusahead (*Elymus caput-medusae*), rye grass (*Festuca perennis*), barley (*Hordeum murinum*), oats (*Avena fatua*), star thistle (*Centaurea solstitialis*), and storksbill (*Erodium botrys*). Roadside vegetation in the SR 99 alignment consists of similar species.

Wildlife

The Project site is located within an extensive grassland/vernal pool matrix. Commonly occurring species within Northern California grasslands include western toad (*Anaxyrus boreas*), Sierra chorus frog (*Pseudacris sierra*), western fence lizard (*Sceloporus occidentalis*), skinks (*Plestiodon* sp.), gopher snake (*Pituophis catenifer*), garter snakes (*Thamnophis* sp.), and northern Pacific rattlesnake (*Crotalus oreganus*). Mammals including Audubon's cottontail (*Sylvilagus audubonii*) and coyote (*Canis latrans*) could be expected, and abundant black-tail jackrabbit (*Lepus californicus*) and California vole (*Microtus californicus*) were observed during the site visit. Common bird species include western meadowlark (*Sturnella neglecta*), northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macroura*), horned larks (*Eremophila alpestris*), and savannah sparrow (*Passerculus sandwichensis*). Most birds with potential to nest in the Project area are covered under the Migratory Bird Treaty Act (MBTA), which protects breeding birds, their nests, eggs, and young during the breeding season (typically February 1 to October 1).

Soils

There are three soil units mapped within the site: Anita clay (Ad); Redding gravelly loam (RnB), 3 to 8 percent slopes; and Tuscan clay loam (TtB), 1 to 8 percent slopes. None of these units usually contain hydric inclusions. Characteristic of this area, soils on the Project site are underlain by an impervious duripan, which restricts water percolation.

Potential Waters of the United States

A Wetlands Assessment was performed at the Project site. A total of 0.019 acre of Waters of the United States has been mapped, including a seasonal wetland and ditches (see Table 4.4-1).

Table 4.4-1
Potential Waters of the United States

Habitat Type	Impact Acreage
Seasonal Wetland	0.002 acres
Ditch	0.017 acres
Total	**0.019 acres**

Seasonal wetlands are ephemeral features wetted due to the accumulation of surface runoff and rainwater into low-lying areas. Inundation tends to be short, and they are often dominated by non-native hydrophytic species. One small seasonal wetland of approximately 0.002 acre in size occurs in the off-site road improvement area. Plant species identified within the seasonal wetland include barley (*Hordeum* sp.), ryegrass, storksbill, and hairy hawkbit (*Leontodon taraxicoides*). Due to drought conditions, plants had only recently started growing and other species present were not identifiable.

Drainage ditches are constructed linear features meant to convey water to or from its desired location. They may be vegetated or not and may or may not feature a high water mark. For the purposes of the BRA, ditches were identified by the presence of water and their location as drainage features on the side of the road. Ditches were vegetated with an assortment of grasses (not yet in bloom). One ditch of approximately 0.017 acre in size runs along the roadside in the off-site road improvement area. At the culvert under the driveway access to the helitack facility, water was ponded and approximately 0.5 meter deep.

Special-Status Species

Using information from the California Natural Diversity Database (CNDDB), the literature review, and observations in the field, a list of special-status plant and animal species that have the potential to occur on the site was generated. Each of these species was assessed for their potential to occur on-site based on the following criteria guidelines:

Present	Species was observed during the site visit or is known to occur within the project boundary based on documented occurrences within the CNDDB.
Potential to Occur	Habitat (including soils and elevation requirements) for the species occurs within the project boundary.
Low Potential to Occur	Marginal or limited amounts of habitat occur and/or the species is not known to occur in the vicinity based on CNDDB records and other available documentation.
Absent	No suitable habitat (including soils and elevation requirements) and/or the species is not known to occur in the vicinity based on CNDDB records and other available documentation.

Only those species that have been determined to have at least some potential to occur on-site are listed in Table 4.4-2. For a complete list of species analyzed in the Biological Resources Assessment, refer to Appendix B.

Table 4.4-2
Special-Status Species

Common Name	Scientific Name	Federal ESA Status	California ESA Status	Other Status	Habitat Description	Approx. Survey Dates	Potential to Occur On-site
Plants							
adobe lily	*Fritillaria pluriflora*			1B	Often found on adobe soils in chaparral, cismontane woodland, and valley and foothill grassland from 180 to 2,100 feet msl.	February–April	Low Potential to Occur
Invertebrates							
vernal pool fairy shrimp	*Branchinecta lynchi*	FT	—	—	Found in vernal pools and ephemeral wetlands.	November –April	Low Potential to Occur
California linderiella	*Linderiella occidentalis*	—	—	CNDDB	Found in vernal pools and ephemeral wetlands.	November –April	Low Potential to Occur
Amphibians							
western spadefoot	*Spea hammondii*	—	—	CSC	California endemic species of vernal pools, swales, wetlands, and adjacent grasslands throughout the Central Valley.	March–May	Low Potential to Occur
Birds							
burrowing owl (burrow sites)	*Athene cunicularia*	—	—	BCC, CSC	Nests in California ground squirrel (*Otospermohilus beecheyi*) burrows in grasslands, open areas, rural edges.	March–August	Potential to Occur
long-billed curlew (wintering)	*Numenius americanus*	—	—	BCC	Nests on the ground in grasslands and pastures.	September –March	Low Potential to Occur
loggerhead shrike	*Lanius ludovicianus*	—	—	BCC, CSC	A species of grasslands, open xeric areas, some woodlands.	March–July	Potential to Occur
grasshopper sparrow	*Ammodramus savannarum*	—	—	CSC	Nests on the ground in grasslands.	May–July	Low Potential to Occur

Status Codes:

FT Federal ESA listed, Threatened
BCC US Fish and Wildlife Service Bird of Conservation Concern
CSC California Department of Fish and Wildlife Species of Special Concern
1B California Rare Plant Rank/Rare or Endangered in California and elsewhere
CNDDB Species that is tracked by the CDFW's Natural Diversity Database but does not have any of the above special-status designations otherwise

Source: ECORP 2014a

Special-Status Plants

No special-status plants were found within the Project site during biological reconnaissance, and habitat for most rare plant species is lacking. The on-site improvement area is frequently mowed and landscaped, so no potential exists for rare plants within the site. Adobe lily (*Fritillaria pluriflora*) has been found nearby and has minor potential to occur in the off-site roadside improvement area. This species blooms from February through April and occurs on adobe (heavy clay) or occasionally serpentine soils. This species was not observed in bloom during the survey, and no vegetative liliaceous rosettes (emerging plants) were noted. To date, no field surveys have been conducted, so this species cannot be excluded from consideration. Critical habitat designated by the US Fish and Wildlife Service (USFWS) for Greene's tuctoria, Hoover's spurge, hairy orcutt grass, and slender orcutt grass occurs within 5 miles to the northeast of the site, but habitat is not present for these species in the on-site or off-site areas.

Special-Status Wildlife

A number of special-status animal species have been documented to occur within 5 miles of the Project site. Many of these are affiliated with either the Sacramento River, which occurs approximately 2.75 miles west, or the Vina Plains Preserve, which occurs immediately southeast of the Project site. Table 4.4-2 includes these and other special-status animals that may occur in the vicinity. To date, no field surveys have been conducted on-site according to agency-promulgated protocols for special-status wildlife species. For a complete description of the potential special-status wildlife that may be affected by Project implementation, see Appendix B.

Wildlife Movement Corridors

The site is located adjacent to a busy highway, but within a generally undeveloped landscape with annual grassland (non-irrigated) used for livestock grazing. The annual grassland community in this region is an important resource for wintering raptors, and the ephemeral wetlands and intermittent drainages likely support wildlife (e.g., waterfowl, waders, and shorebirds) movement during the wet season and less so during the dry summer/fall months. However, given the proximity of the site to SR 99 and the abundance of available open land for movement in the general area, the site is probably not part of a movement corridor for terrestrial species.

4.4.2 Regulatory Setting

Federal Regulations

<u>Endangered Species Act</u>

The Endangered Species Act (ESA) protects plants and wildlife that are listed as endangered or threatened by the USFWS and the National Marine Fisheries Service (NMFS). Section 9 of the ESA prohibits the taking of endangered wildlife, where taking is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 CFR 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any endangered plant on federal land and removing, cutting, digging up, damaging, or destroying any endangered plant on non-federal land in knowing violation of state law (16 USC 1538). Under Section 7 of the ESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed (or proposed) species (including plants) or its critical habitat. Through consultation and the issuance of a biological opinion, the USFWS would issue an incidental take statement allowing take of the species that is

incidental to an otherwise authorized activity, provided the activity would not jeopardize the continued existence of the species. Section 10 of the ESA provides for issuance of incidental take permits where no other federal actions are necessary, provided a habitat conservation plan is developed.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the United States and other nations devised to protect migratory birds and any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. As authorized by the MBTA, the USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. The regulations governing migratory bird permits can be found in 50 CFR Part 13, General Permit Procedures, and 50 CFR Part 21, Migratory Bird Permits. The State of California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the California Fish and Game Code.

Clean Water Act

The federal Clean Water Act's (CWA) purpose is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA prohibits the discharge of dredged or fill material into waters of the United States without a permit from the US Army Corps of Engineers (USACE). The definition of waters of the United States includes rivers, streams, estuaries, the territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 7b). The US Environmental Protection Agency (EPA) also has authority over wetlands and would override a USACE permit.

Substantial impacts to wetlands would require an individual permit. Projects that only minimally affect wetlands would meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the Regional Water Quality Control Board (RWQCB).

State or Local Regulatory Requirements

California Endangered Species Act

The California Endangered Species Act (CESA) generally parallels the main provisions of the federal ESA, but unlike its federal counterpart, the CESA applies the take prohibitions to species proposed for listing (called "candidates" by the State). Section 2080 of the California Fish and Game Code prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The CESA allows take incidental to otherwise lawful development projects. State lead agencies are required to consult with the California Department of Fish and Wildlife (CDFW) to ensure that any action they undertake is not likely to jeopardize the continued existence of any endangered or threatened species or result in destruction or adverse modification of essential habitat.

Fully Protected Species

The State of California first began to designate species as "fully protected" prior to the creation of the CESA and the ESA. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction and included fish, amphibians, reptiles, birds, and mammals. Most fully protected species have since been listed as threatened or endangered under the CESA and/or the ESA. The regulations that implement the Fully Protected Species Statute (California Fish and Game Code Section 4700) provide that fully protected species may not be taken or possessed at any time. Furthermore, the CDFW prohibits any state agency from issuing incidental take permits for fully protected species, except for necessary scientific research.

Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 (California Fish and Game Code Sections 1900–1913) was created with the intent to "preserve, protect and enhance rare and endangered plants in this State." The act is administered by the CDFW. The Fish and Game Commission has the authority to designate native plants as "endangered" or "rare" and to protect endangered and rare plants from take. The CESA of 1984 (California Fish and Game Code Sections 2050–2116) provided further protection for rare and endangered plant species, but the NPPA remains part of the California Fish and Game Code.

California Streambed Alteration Notification/Agreement

Section 1602 of the California Fish and Game Code requires that a Streambed Alteration Application be submitted to the CDFW for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake." The CDFW reviews the proposed actions and, if necessary, submits to the applicant a proposal for measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by the CDFW and the applicant is the Streambed Alteration Agreement. Often, projects that require a Streambed Alteration Agreement also require a permit from the USACE under Section 404 of the Clean Water Act. In these instances, the conditions of the Section 404 permit and the Streambed Alteration Agreement would overlap.

4.4.3 Biological Resources (IV.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	☐	☒	☐	☐

A number of special-status species have the potential to occur on the Project site, including those discussed below.

Amphibians and Reptiles

Western Spadefoot

The Project site supports potential foraging habitat for the western spadefoot (*Spea hammondi*). The western spadefoot is not listed pursuant to either the CESA or the ESA; however, it is designated as a CDFW species of special concern. Necessary habitat components of the Western spadefoot toad include suitable underground retreats and breeding ponds. Suitable breeding sites include temporary rain pools, such as vernal pools and seasonal wetlands, or pools within portions of intermittent drainages. Spadefoots spend most of their adult life in underground burrows or other suitable refugia such as rodent burrows. Western spadefoot are known to occur from Redding in Shasta County southward to northwestern Baja California at elevations below 4,475 feet and occur within 5 miles of the Project site. None were observed during the biological field reconnaissance done in March 2014, and breeding habitat does not occur on-site. However, the site would be used for foraging or as refuge by this species, if they are present nearby.

Birds

Special-status birds that have been observed or could occur within the vicinity of the Project site include white-tailed kite (*Elanus leucurus*), northern harrier (*Circus cyaneus*), ferruginous hawk (*Buteo regalis*), Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), osprey (*Pandion haliaetus*), golden eagle (*Aquila chrysaetos*), burrowing owl (*Athene cunicularia*), short-eared owl (*Asio flammeus*), long-billed curlew (*Numenius americanus*), western yellow-billed cuckoo (*Coccyzus americanus*), loggerhead shrike (*Lanius ludovicianus*), grasshopper sparrow (*Ammodramus savannarum*), and tricolored blackbird (*Agelaius tricolor*). Of these, nesting habitat is absent for most species including the large raptors and riparian/marsh affiliated species. However, a preconstruction nesting bird survey of all suitable habitats on the Project site shall be conducted within 14 days prior to initiation of construction activities during the nesting season (February 1–August 31), as stated in mitigation measures B-3, B-5 and B-6. If construction activities are initiated during the non-nesting season, nesting bird surveys would not need to be conducted, with the exception of the burrowing owl survey, as stated in mitigation measure B-2.

The following are accounts of species considered in this assessment.

Burrowing Owl

The burrowing owl is not listed pursuant to either the CESA or the ESA; however, it is designated as a bird of conservation concern by the USFWS and a species of special concern by the CDFW. Burrowing owls inhabit dry open rolling hills, grasslands, desert floors, and open bare ground with gullies and arroyos. They can also inhabit developed areas such as golf courses, cemeteries, roadsides within cities, airports, vacant lots in residential areas, school campuses, and fairgrounds. This species typically uses burrows created by fossorial mammals, most notably the California ground squirrel (*Otospermophilus beecheyi*), but may also use man-made structures such as cement culverts or pipes; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement. The breeding season typically occurs between February 1 and August 31. No burrowing owls were observed during the March 2014 site reconnaissance, and ground squirrel burrows were not observed. However, the site provides potential nesting habitat for the species.

Short-Eared Owl

Short-eared owl is a CDFW species of special concern and has no federal status. Typical habitat includes marshes, grasslands, meadows, river margins, and agricultural lands. Breeding locations are scattered throughout California, including the southern Sacramento Valley (uncommon and irregular) and Grizzly Island, Solano County (a major wintering and breeding area for California). Most occurrences within the Central Valley are of winter residents or migrants. Nesting of the short-eared owl on the Project site is unlikely given the disturbed and active nature of the site.

Western Yellow-Billed Cuckoo

Western yellow-billed cuckoo is listed as an endangered species pursuant to the California Endangered Species Act but has no federal special status. Typical habitat includes dense riparian thicket/woodland. This migratory species arrives from its wintering grounds in South America during June and departs from California during September. In Northern California, current nesting populations occur along the upper Sacramento River (Tehama, Butte, Colusa, Glenn, and Sutter counties), the Feather River, and the Butte Sink (Sutter and Butte counties).

Loggerhead Shrike

The loggerhead shrike is not listed pursuant to either the CESA or the ESA, but it is considered a bird of conservation concern by the USFWS and a species of special concern by the CDFW. Loggerhead shrikes nest throughout California except the northwestern corner, montane forests, and high deserts. Loggerhead shrikes nest in small trees and shrubs in open country with short vegetation such as pastures, old orchards, mowed roadsides, cemeteries, golf courses, agricultural fields, riparian areas, and open woodlands. The nesting season extends from March through June. The trees on-site represent potential nesting habitat for loggerhead shrike.

Grasshopper Sparrow

The grasshopper sparrow is not listed pursuant to either the CESA or the ESA, but it is designated as a species of special concern by the CDFW. The grasshopper sparrow is an uncommon and local, summer resident and breeder along the western edge of the Sierra Nevada and most coastal counties south to Baja California (where resident). This species generally inhabits moderately open grasslands and prairies with patchy bare ground and scattered shrubs. Grasshopper sparrows are more likely to occupy large tracts of habitat than small fragments. Breeding generally occurs from early April to mid-July, with a peak in May and June. Given the disturbed nature of the Project site, the annual grassland community within the site represents marginal nesting habitat for grasshopper sparrows.

Tricolored Blackbird

The tricolored blackbird is not listed pursuant to either the CESA or the ESA; however, it is designated as a species of special concern by the CDFW. This colonial nesting species is distributed widely throughout the Central Valley, the Coast Range, and into Oregon, Washington, Nevada, and Baja California. Tricolored blackbirds nest in colonies that can range from several pairs to several thousand pairs, depending on prey availability, the presence of predators, or the level of human disturbance. This nomadic species typically nests in emergent marsh, riparian thickets, and blackberry brambles, usually with some nearby standing water or ground saturation. Open grassland and agricultural fields are typical foraging areas, with nesting generally occurring from April through June. There is no suitable nesting habitat on-site for tricolored blackbirds.

Wintering Special-Status Birds

Several special-status birds may forage within the property during the non-nesting season: ferruginous hawk, golden eagle, and long-billed curlew. These species are typically not found in the Central Valley during the nesting season, however.

Ferruginous Hawk

Ferruginous hawk is tracked by the CNDDB but otherwise has no federal or state special status. This species typically occurs in open habitats and nests from Oregon into Canada, and nesting has been documented to occur in California only in Lassen County. For the remainder of the state, including the Central Valley, ferruginous hawk occurrences are restricted to the non-breeding season (September through April). Winter foraging occurs in a variety of open habitats, including open grassland and oak savannah.

Golden Eagle

The golden eagle is designated as a bird of conservation concern by the USFWS but has no other federal special status. Additionally, golden eagles are fully protected according to California Fish and Game Code Section 3511. Golden eagles generally nest on cliff ledges and/or in large lone trees in mostly rolling to mountainous terrain. Occurrences within the Central Valley floor are usually of post-breeding residents, non-breeding juveniles, or migrants. Foraging habitat includes open grassland and savannah.

Long-Billed Curlew

Long-billed curlew is designated as a bird of conservation concern by the USFWS but has no other federal special status. Long-billed curlew do not nest in California, but may occur in grassland and wetland habitats of the Central Valley during migration and winter.

Invertebrates

Although considered unlikely, the seasonal wetland and pooled portions of ditches in the roadside easement may represent potentially suitable habitat for vernal pool fairy shrimp (*Branchinecta lynchi*) and the CNDDB-tracked California linderiella (*Linderiella occidentalis*). Of these, California linderiella is most likely to occur. Conservancy fairy shrimp (*Branchinecta conservatio*) and vernal pool tadpole shrimp (*Lepidurus packardii*) are considered absent from the Project area, given the extremely limited aquatic habitat present. There are no elderberry shrubs (*Sambucus nigra* ssp. *caerulea*), exclusive host plant for the federally threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), present on-site. Likewise, sandy riverine dune habitats needed by the two anthicid beetles are not present on-site.

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp is listed as threatened in accordance with the ESA. Vernal pool fairy shrimp may occur in seasonal ponds, vernal pools, and swales during the wet season, which generally occurs from December through May. This species can be found in a variety of pool sizes, ranging from less than 0.001 acre to more than 24.5 acres.

The shrimp hatch from cysts when colder water (10°C [50°F] or less) fills the pool and mature in as few as 18 days under optimal conditions. At maturity, mating takes place and cysts are dropped.

Vernal pool fairy shrimp occur in disjunct patches dispersed across California's Central Valley from Shasta County to Tulare County, the central and southern Coast Ranges from northern Solano County to Ventura County, and three areas in Riverside County. Vernal pool fairy shrimp have been found very close to the Project site, but surveys within the Project area have not been performed to date. USFWS-designated critical habitat for vernal pool fairy shrimp occurs within 5 miles to the northeast of the site.

Other Special-Status Invertebrates

Three other CNDDB-tracked species may be found in association with vernal pools and seasonal wetlands on-site: California linderiella, Antioch Dunes anthicid beetle (*Anthicus antiochensis*), and Sacramento anthicid beetle (*A. sacramento*). California linderiella is a small freshwater branchiopod related to the fairy shrimp (*Branchinecta*, above). Of the two vernal pool branchiopods with potential to occur in waters on-site, this is the most likely species, having the most generalist habitat needs. The Antioch Dunes anthicid beetle and the Sacramento anthicid beetle need sandy dunes, which are not present on-site.

Mitigation Measures

B-1 Special-Status Plants

The Project site supports limited potential habitat for adobe lily, which has low likelihood of occurring in the off-site SR 99 right-of-way. The following mitigation measure is included to minimize potential impacts to this plant:

A. Perform focused plant surveys according to California Native Plant Society (CNPS) protocol. Surveys should be timed according to the blooming period for adobe lily (February–April), and a known reference population should be visited prior to surveys to confirm the species is blooming where known to occur.

B. If adobe lily is found, avoidance zones shall be established around plants to clearly demarcate areas for avoidance. Avoidance measures and buffer distances shall be determined by a qualified botanist in consultation with the CDFW.

C. If adobe lily is found within the Project site and avoidance of the species is not possible, additional measures such as seed collection and/or translocation shall be developed by a qualified botanist in consultation with the CDFW.

D. If no special-status plants are found, no further measures pertaining to special-status plants are necessary.

Timing/Implementation:	*Conduct plant survey during blooming period (February to April). Enforce avoidance measures during construction if adobe lily is found*
Monitoring/Enforcement:	*Department of Forestry and Fire Protection*

B-2 Burrowing Owl

Burrowing owls (a federal species of concern and CDFW species of special concern) have potential to occur on-site. To minimize impacts to protected burrowing owls and their burrows, the following mitigation measure is included:

A. If possible, initiate site construction activities during the non-breeding season, September 1 through January 31.

B. Conduct a preconstruction burrowing owl survey within 14 days prior to initiation of construction activity, according to the Staff Report on Burrowing Owl Mitigation (CDFG 2012). If no burrowing owls or sign are observed, construction may proceed.

C. If burrowing owls or sign are found, implement avoidance setbacks according to the CDFG (2012).

D. If avoidance setbacks are infeasible, coordinate with CDFW to conduct passive relocation according to protocol outlined in the Staff Report on Burrowing Owl Mitigation (CDFG 2012). If passive relocation methods are employed, the project impact site should be rendered inhospitable for further burrowing owl reoccupation.

Timing/Implementation: *Preconstruction survey within 14 days prior to initiation of construction activity*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

B-3 Loggerhead Shrike/Grasshopper Sparrow

The Project site supports marginal potential nesting habitat for two special-status passerine bird species: loggerhead shrike (a federal species of concern and CDFW species of special concern) and grasshopper sparrow (CDFW species of special concern). To ensure there are no impacts to protected active nests, the following mitigation measure is included:

A. Conduct a preconstruction nesting bird survey of all suitable habitats on the Project site within 14 days prior to initiation of construction activity during the nesting season for the loggerhead shrike (generally February–July) and grasshopper sparrow (generally March–July).

B. If active nests are found, the nests shall be monitored prior to any construction-related activity to establish a behavioral baseline. A no-disturbance buffer around the nest shall be established. The buffer distance shall be established by a qualified biologist in consultation with the CDFW. Once construction activities commence on-site, all nests will be monitored by a qualified biologist to detect any behavioral changes as a result of construction of the Proposed Project. If behavioral changes are observed that may result in adverse effects to the success of breeding, the work causing that change shall cease and consultation with the CDFW shall be initiated to identify potential avoidance and minimization measures. Preconstruction bird nesting surveys are not required for construction activity outside the nesting season.

C. If no active special-status bird nests are found, no further measures pertaining to special-status birds are necessary.

Timing/Implementation: *Preconstruction survey within 14 days prior to initiation of construction activity during February through July*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

B-4 Western Spadefoot

The Project site supports potential foraging or refuge habitat for the western spadefoot (CDFW species of special concern). Therefore, the following mitigation measure is included:

A. Perform preconstruction surveys within 14 days prior to the start of construction. If adult or juvenile spadefoots are found, relocate to nearby suitable habitat in consultation with the CDFW.

Timing/Implementation: *Preconstruction survey within 14 days prior to initiation of construction activity*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

B-5 Nesting Raptors

All raptors and their active nests are protected under the California Fish and Game Code and the federal MBTA. To ensure there are no impacts to protected active nests, the following mitigation measure is included:

A. Conduct a preconstruction nesting bird survey of all suitable habitats on the Project site within 14 days prior to initiation of construction activity during the nesting season (February 1–August 31).

B. If active nests are found, the active nests will be monitored for the first 24 hours prior to any construction-related activity to establish a behavioral baseline. A no-disturbance buffer around the nest shall be established. The buffer distance shall be established by a qualified biologist in accordance with the CDFW's recommendations for buffer distances relative to the species identified. Once construction activities commence on-site, all nests will be monitored by a qualified biologist to detect any behavioral changes as a result of construction of the Proposed Project. If behavioral changes are observed that may result in adverse effects to the success of breeding, the work causing that change shall cease and consultation with the CDFW shall be initiated to identify potential avoidance and minimization measures. Preconstruction raptor nesting surveys are not required for construction activity outside the nesting season.

C. If no active raptor nests are found, no further measures pertaining to raptor nests are necessary.

Timing/Implementation: *Preconstruction survey within 14 days prior to initiation of construction activity February through August*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

B-6 Birds Covered Under the Migratory Bird Treaty Act

Many birds, including commonly occurring species such as mourning dove, western meadowlark, and northern mockingbird, are protected under the California Fish and Game Code and the federal MBTA. A complete list of birds protected can be found in 50 CFR 10.13. To ensure there are no impacts to protected birds or their active nests, the following mitigation measure is included:

A. Conduct a preconstruction nesting bird survey of all suitable habitats on the Project site within 14 days prior to initiation of construction activity during the nesting season (February 1–August 31).

B. If active nests are found, the active nests will be monitored prior to any construction-related activity to establish a behavioral baseline. A no-disturbance buffer around the nest shall be established. The buffer distance shall be established by a qualified biologist in consultation with the CDFW. Once construction activities commence on-site, all nests will be monitored by a qualified biologist to detect any behavioral changes as a result of construction of the Proposed Project. If behavioral changes are observed that may result in adverse effects to the success of breeding, the work causing that change shall cease and consultation with the CDFW shall be initiated to identify potential avoidance and minimization measures. Preconstruction bird nesting surveys are not required for construction activity outside the nesting season.

C. If no special-status birds are found, no further measures pertaining to special-status birds are necessary.

Timing/Implementation: *Preconstruction survey within 14 days prior to initiation of construction activity February through August*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

B-7 Vernal Pool Crustaceans

The following mitigation measure is included to minimize potential impacts to vernal pool crustaceans:

A. The Project will require consultation under Section 7 of the ESA, which will be pursued concurrent with the submittal of the Section 404 application.

B. Based on findings of the Biological Resources Assessment (ECORP 2014a) and the Section 404 application, the USFWS may issue a Biological Opinion (BO), a document that states the opinion of the USFWS as to whether or not an action by another federal agency (USACE) is likely to jeopardize the continued existence of a listed species (vernal pool fairy shrimp) or result in the destruction or adverse modification of critical habitat. The BO shall provide measures to contribute to the conservation of and adequately mitigate for any potential adverse effects to federally listed vernal pool crustacean species.

Timing/Implementation: *Prior to initiation of construction activities*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

b) Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

Plant communities within the Project site include developed/landscaped areas with planted lawns and small ornamental trees, and annual grassland consisting of medusahead, rye grass, barley, oats, star thistle, and storksbill. Roadside vegetation in the SR 99 alignment consists of similar species. The Project site is not identified as being located in an area with any riparian habitat or other sensitive natural communities. Therefore, the Project would have no impact in this area.

c) Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☒	☐	☐

The off-site roadside improvement area supports 0.019 acre of potential waters of the US and marginal potential vernal pool crustacean habitat.

Mitigation Measure

B-8 Waters of the United States

The following mitigation measure is included to minimize potential impacts to waters of the United States:

A. An application for authorization to fill wetlands under Section 404 of the federal Clean Water Act will be prepared and submitted to the USACE.

B. If mitigation is required for the fill of wetlands, mitigation shall be obtained through the purchase of off-site credits or other means to ensure no net loss of wetland acreage.

Timing/Implementation: *Prior to initiation of construction activities*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
d)	Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒

The Project site is located adjacent to a busy highway, but within a generally undeveloped landscape with annual grassland (non-irrigated) used for livestock grazing. The annual grassland community in this region is an important resource for wintering raptors, and the nearby matrix of ephemeral wetlands and intermittent drainages likely support wildlife (e.g., waterfowl, waders, and shorebirds) movement during the wet season and less so during the dry summer/fall months. However, given the proximity of the site to SR 99 and the abundance of available open land for movement in the general area, the Project site is not considered to be part of a movement corridor for terrestrial species. Therefore, the Project would have no impact in this area.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
e)	Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒

The Project site has been fully developed for many years. Redevelopment of the site would not change the existing use nor would it conflict with any local policies or ordinances protecting biological resources such as the Tehama County Voluntary Oak Woodland Management Plan. Therefore, the Project would have no impact in this area.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
f)	Would the project conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

There is not an adopted habitat conservation plan or natural community conservation plan in the vicinity of the Project site. Therefore, the Project would have no impact in this area.

4.5 Cultural Resources

4.5.1 Environmental Setting

A Cultural Resources Inventory Report was prepared by ECORP Consulting, Inc. (2014b; Appendix C) for the Proposed Project to determine whether cultural resources were present in or adjacent to the Project site and to assess the sensitivity of the Project site for undiscovered or buried cultural

resources. The cultural context of the Project site, including regional and local prehistory, ethnography, and regional and Project area histories, can be found in the report in Appendix C.

The inventory and evaluation effort included a records search and literature review, focused archival research, and an intensive field survey. The records search results indicated that four previous cultural resources investigations and one previous archaeological overview have been conducted within 0.5 mile of the Project site. As part of one of those studies, the Control Station in the Vina Helitack Base, identified as site P-52-2064H, was previously recorded in 1991 and evaluated in 1993 by Thornton. The Control Station was evaluated as an historical resource, but the 1991 and 1993 records do not indicate that every building or structure within the base was inventoried; only an architectural evaluation of the Control Station was completed. One previously conducted archaeological inventory of approximately 1 acre was conducted around the areas of the base now containing the helicopter hangar and moveable helipad. No other archaeological or historical resources have been previously recorded within the Project site.

In order to update the previous evaluation of the Control Station at the base and carry out a complete inventory of the entire property, an intensive pedestrian survey of the Project site was conducted. An updated evaluation of the Control Station at the base was completed using the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) eligibility criteria. The Control Station (P-52-2064H) was previously evaluated in 1993 as not eligible for inclusion on the NRHP or the CRHR. As a result of the updated evaluation, the results have not changed and the site is still recommended not eligible. The updated evaluation also includes considerations for all ancillary features associated with the Control Station, which were not originally considered part of site P-52-2064H. No other archaeological or historical resources were found during the survey.

Paleontological Resources

Paleontological resources include mineralized (fossilized) or unmineralized bones, teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. A Paleontological Records Search and Preconstruction Assessment was completed for the Project in February 2014 (ECORP 2014c; Appendix D). The purpose of the paleontological assessment was to determine the potential for known or unknown paleontological resources on the Project site. The assessment used information provided by the University of California, Museum of Paleontology (UCMP) and included a search of the paleontology specimen collection records for the Project area and vicinity. In addition, a query of the UCMP online catalog records, a review of regional geologic maps from the California Geological Survey, and a review of existing literature on paleontological resources of Tehama County were conducted.

4.5.2 Regulatory Setting

Cultural Resources Obligations Under CEQA

CEQA (Title 14, CCR, Article 5, Section 15064.5) applies to cultural resources of the historical and prehistoric periods. Any project with an effect that may cause a substantial adverse change in the significance of a cultural resource, either directly or indirectly is a project that would have a significant impact on the environment. As a result, such a project would require avoidance or mitigation of impacts to those affected resources. Significant cultural resources must meet at least one of four criteria that define eligibility for listing on either the California Register of Historical Resources (PRC Section 5024.1, Title 14 CCR, Section 4852) or the National Register of Historic Places (36 CFR 60.4). Cultural resources eligible for listing on the NRHP are considered historic

properties under 36 CFR Part 800 and are automatically eligible for the CRHR. Resources listed on or eligible for inclusion in the CRHR are considered to be historical resources (significant) under CEQA.

The lead agency is responsible for ensuring compliance with mitigation measures for historical resources, as defined by CEQA, in order to reduce impacts. Per Section 15097 of Title 14, Chapter 3, Article 7 of CEQA, Mitigation Monitoring or Reporting, "the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the Project and the measures it has imposed to mitigate or avoid significant environmental effects. A public agency may delegate reporting or monitoring responsibilities to another public agency or to a private entity which accepts the delegation; however, until mitigation measures have been completed the lead agency remains responsible for ensuring that implementation of the mitigation measures occurs in accordance with the program."

To meet the regulatory requirements of the Project, a cultural resources investigation was conducted pursuant to the provisions for the treatment of cultural resources contained in CEQA (PRC Section 21000 et seq.). In order to state in a CEQA environmental document that there are or are not historical resources in the Project area as defined by CEQA (CCR Title 14, Section 15064.5), the standing structures identified by the survey that would be subject to impacts as a result of the Project must be evaluated for significance using CRHR eligibility criteria. If determined eligible, mitigation could consist of either avoidance by preserving them in dedicated open space or by carrying out photographic and historical documentation efforts prior to Project approval, implementation, or demolition.

4.5.3 Cultural Resources (V.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☒	☐	☐

Cultural Resources

No archaeological resources were encountered during the survey. In addition, an updated architectural inventory and evaluation was completed for the Vina Helitack Base, which comprises one main base building with an attached cupola, as well as several ancillary buildings and structures. The main base building was originally evaluated in 1993 as not eligible for inclusion on the NRHP under three criteria (A, B, and D). An updated evaluation against all NRHP and CRHR criteria and consideration of integrity did not reverse this recommendation. The ancillary buildings and structures, including the helicopter hangar, helipad, and equipment garage, were constructed in 1999 and 2000 and are not old enough to be considered cultural resources and therefore did not require evaluation. Therefore, the Vina Helitack Base is evaluated as not eligible for the NRHP and CRHR under any criteria and is not considered a historical resource under CEQA or a historic property under the NHPA.

Although there is a low potential for archaeological deposits in the Project area, there remains a possibility that unrecorded cultural resources are present beneath the ground surface and that such resources could be exposed during Project construction. Both CEQA and Section 106 of the NHPA require the lead agency to address any unanticipated cultural resource discoveries during Project construction. Impacts to unknown resources would be less than significant with Mitigation Measure C-1.

Mitigation Measure

C-1 Unanticipated Discovery

If subsurface deposits believed to be cultural or human in origin are discovered during construction, all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for a prehistoric and historic archaeologist, shall be retained to evaluate the significance of the find and shall have the authority to modify the no-work radius as appropriate, using professional judgment. A Native American monitor, following the Guidelines for Monitors/Consultants of Native American Cultural, Religious, and Burial Sites established by the Native American Heritage Commission, shall be required if the nature of the unanticipated discovery is prehistoric.

Work cannot continue within the no-work radius until the archaeologist conducts sufficient research and data collection to make a determination that the resource is either (1) not cultural in origin or (2) not potentially significant or eligible for listing on the NRHP or the CRHR.

If a potentially eligible resource is encountered, the Project proponent shall arrange for either (1) total avoidance of the resource, if possible, or (2) test excavations to evaluate eligibility and, if eligible, total data recovery as mitigation. The determination shall be formally documented in writing and submitted to the lead agency as verification that the provisions in CEQA for managing unanticipated discoveries have been met.

In the event that fossils are encountered, they shall be analyzed to a point of identification and curated at an established accredited museum repository with permanent retrievable paleontological storage. A technical report of findings shall be prepared with an appended itemized inventory of identified specimens and submitted with the recovered specimens to the curation facility.

Timing/Implementation: *During construction activities*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
b)	Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☒	☐	☐

While no evidence of archaeological resources has been identified within the Project site and surrounding adjacent area, ground disturbance has the potential to impact subsurface archaeological resources should any be present. Impacts to unknown resources would be less than significant with Mitigation Measure C-1.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
c)	Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

The paleontological assessment identified that the UCMP has 394 paleontological specimens from 820 localities in Tehama County. However, not all specimens in the UCMP collections have been catalogued and digitized, and other specimens have likely been recorded in the vicinity of the Project area. The specific location of all localities is available only to qualified paleontologists, and the location of these occurrences relative to the Project area is unclear without more extensive archival research (ECORP 2014c, p. 2). According to the paleontological assessment, the records search determined that no fossil vertebrate localities are located within or near the Project site. However, based on the geologic rock unit and soil types present in the Project area, the Project site has an undetermined potential for containing nonrenewable paleontological resources. Impacts to unknown resources would be less than significant with Mitigation Measure C-1.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
d)	Would the project disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

No known burial sites were identified during the Cultural Resources Inventory Report survey. A search of the Sacred Lands File by the Native American Heritage Commission (NAHC) failed to indicate the presence of Native American cultural resources in the Project area. Follow-up telephone calls were successful in contacting the Native American contacts. James Hayward Sr. stated that the Redding Rancheria did not have any concerns regarding the Project; however, if an inadvertent discovery is found during ground-disturbing activities, he requested that the county coroner and local tribes be contacted. Cody Pata of the Paskenta Band of Nomlaki Indians stated that the tribe does not have any concerns regarding the Project and that the helitack base is slightly outside of their tribal territory.

While comments were received from local tribal consultation, no Native American archaeological sites or burial sites in the Project area were identified. Regardless, there is a possibility of the unanticipated and accidental discovery of human remains during ground-disturbing Project-related activities. Therefore, Mitigation Measure C-2 is provided below to address the potential for the discovery of any unrecorded or previously unknown resources.

Mitigation Measure

C-2 Discovery of Unknown Human Remains

In the event that evidence of human remains is discovered, construction activities within 100 feet of the discovery will be halted or diverted and the requirements of this mitigation measure will be implemented. In addition, the provisions of Section 7050.5 of the California Health and Safety Code, Section 5097.98 of the California Public Resources Code, and Assembly Bill (AB) 2641 will be implemented. When human remains are discovered, state law requires that the discovery be reported to the county coroner (Section 7050.5 of the

Health and Safety Code) and that reasonable protection measures be taken during construction to protect the discovery from disturbance (AB 2641). If the coroner determines the remains are Native American, the Coroner notifies the Native American Heritage Commission, which then designates a Native American Most Likely Descendant (MLD) for the Project (PRC Section 5097.98). The designated MLD then has 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains (AB 2641). If the landowner does not agree with the recommendations of the MLD, the NAHC can mediate (PRC Section 5097.94). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (PRC Section 5097.98). This will also include either recording the site with the NAHC or the appropriate Information Center, using an open space or conservation zoning designation or easement, or recording a document with the county in which the property is located (AB 2641).

Timing/Implementation: *During construction activities*

Monitoring/Enforcement: *Department of Forestry and Fire Protection*

4.6 Geology and Soils

4.6.1 Environmental Setting

Geomorphic Setting

California's geomorphic provinces are naturally defined geologic regions that display a distinct landscape or landform. Earth scientists recognize eleven provinces in California. Each region displays unique, defining features based on geology, faults, topographic relief, and climate. The Project site is located in the Great Valley geomorphic province. The Great Valley is an alluvial plain about 50 miles wide and 400 miles long in the central part of California. Its northern part is the Sacramento Valley, drained by the Sacramento River, and its southern part is the San Joaquin Valley, drained by the San Joaquin River. The Great Valley is a trough in which sediments have been deposited almost continuously since the Jurassic (about 160 million years ago). Oil fields have been found in southernmost San Joaquin Valley and along anticlinal uplifts on its southwestern margin. In the Sacramento Valley, the Sutter Buttes, the remnants of an isolated Pliocene volcano, rise above the valley floor (DOC 2008).

The Project site is underlain by the Pleistocene-age Red Bluff Formation. This formation consists of slightly cemented clayey sand to sandy clay with varying amounts of gravel, cobbles, and, locally, boulders (CGI 2014, p. 5).

Soils

According to the US Department of Agriculture, Natural Resources Conservation Service Web Soil Survey, the Project site soils consist of Anita clay loam, Redding gravelly loam, 3 to 8 percent slopes, and Tuscan clay loam, 1 to 8 percent slopes (USDA-NRCS 2014). Table 4.6-1 summarizes the characteristics of the soil types present in the Project area.

Table 4.6-1
Project Area Soil Characteristics

Soil	Percentage of Site	Drainage	Frost Action	Erosion Hazard	Runoff Potential	Plasticity Index
Anita clay (Ad)	8.8%	Somewhat poorly drained	None	Slight	High	32.5
Redding gravelly loam (RnB), 3 to 8 percent slopes	39.7%	Moderately well drained	None	Moderate	Very high	15.4
Tuscan clay loam (TtB), 1 to 8 percent slopes	51.5%	Well drained	None	Slight	Very high	19.3

Source: USDA-NRCS 2014

Groundwater

In February 2014, CGI Technical Services Inc. completed a geotechnical report for the Project site (see Appendix E). As a part of the report, an analysis of depth to groundwater was competed. The report indicated that groundwater was not encountered in the drill holes and test pits done during the analysis (CGI 2014, p. 6). The report also provided historical groundwater information for the water well at the site, obtained from the California Department of Water Resources, and identified that groundwater depth ranged from 57.0 to 71.3 feet below ground surface between May 1965 and October 2012 (CGI 2014, p. 6).

Regional Seismicity and Fault Zones

The California State Mining and Geology Board defines an “active fault” as one that has had subsurface displacement within the past 11,000 years (Holocene). “Potentially active faults” are defined as those that have ruptured between 11,000 and 1.6 million years before the present (Quaternary). Faults are generally considered inactive if there is no evidence of displacement during the Quaternary period.

The northern Sacramento Valley in general is not characterized by an abundance of active faulting. Tehama County is located in an area of low seismic activity relative to other areas of California. According to the Alquist-Priolo Earthquake Maps defining faults in California, few faults are located in Tehama County. The closest active fault systems to Tehama County are the Hat Creek fault zone, located about 55 miles northeast of Red Bluff in Shasta County, and the Bartlett Springs fault, located about 60 miles southeast of Red Bluff in Mendocino County (Tehama County 2008, p. 4.6-5). Both of these systems are over 55 miles from the Project site.

According to the geotechnical report, a number of potentially and active faults are located in the Project region (CGI 2014, p. 8). Table 4.6-2 lists those faults and their proximity to the Project site.

Table 4.6-2
Regional Fault Information

Fault Name	Fault Activity Rating[1]	Distance from Site (miles)	Upper Bound Earthquake (Mw)
Foothills Fault System	A	4.4	6.5
Great Valley 1	A	22.5	6.7
Battle Creek	PA	32.1	6.5
Rate for NE California	A	35.5	7.3
Great Valley 2	A	46.4	6.4
Hat Creek-MacArthur-Mayfield	A	57.4	7.0
Great Valley 3	A	57.7	6.8
Bartlett Springs	A	59.1	7.1
Round Valley	A	59.8	6.8
Hunting Valley-Berryessa	A	73.3	6.9
Lake Mountain	PA	75.0	6.7
Maacama	A	78.2	7.1

Source: CGI 2014, p. 9
Notes: [1] A= active, PA = potentially active

The geotechnical report also identified the closest inactive fault as being the Chico Monocline located about 5.8 miles east of the Project site and the Corning fault about 10.6 miles from the Project (CGI 2014, p. 9).

4.6.2 Geology and Soils (VI.) Environmental Checklist and Discussion

a) Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	Potentially Significant Impact ☐	Less Than Significant Impact with Mitigation Incorporated ☐	Less Than Significant Impact ☒	No Impact ☐
ii) Strong seismic ground shaking?	Potentially Significant Impact ☐	Less Than Significant Impact with Mitigation Incorporated ☐	Less Than Significant Impact ☒	No Impact ☐
iii) Seismic-related ground failure, including liquefaction?	Potentially Significant Impact ☐	Less Than Significant Impact with Mitigation Incorporated ☐	Less Than Significant Impact ☒	No Impact ☐

iv) Landslides?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☒	☐

i and ii) The geotechnical report included a search of historical earthquakes occurring between 1800 and 1999, listed in the California Geological Survey catalog, performed for a 100-mile radius around the Project site. The search found that 235 earthquakes have occurred within that area. Of those earthquakes, 42 with moment magnitudes (M_W) of 5 or greater and 1 with M_W 6 or greater have occurred in the search area. The largest near-field earthquake to affect the area occurred on January 7, 1881, was estimated to be 5.1 miles from the site, had an estimated M_W of 5.0, and resulted in an estimated ground acceleration of about 0.17g at the site (CGI 2014, p. 12).

As discussed previously, the Project site is located in an area considered to have a low potential for seismic-related hazards. The Project site is not located in an active fault zone, and the nearest active fault is over 22.5 miles from the Project site. Additionally, the Probabilistic Seismic Hazards Assessment map identifies that Tehama County has a less than 10 percent shaking potential. All buildings in California are required to comply with the seismic construction standards of the California Building Code (CBC). Because of the low potential for earthquake hazards and the required compliance with seismic standards in the CBC, the Project would have a less than significant impact in this area.

iii) Liquefaction occurs when loose sand and silt that are saturated with water behave like a liquid when shaken by an earthquake. As stated previously, the Project site has a low potential for seismic activity. Three factors are required for liquefaction to occur: (1) loose, granular sediment; (2) saturation of the sediment by groundwater; and (3) strong shaking.

Project site soils consist of Anita clay, Redding gravelly loam, and Tuscan clay loam. According to the US Department of Agriculture, Natural Resources Conservation Service, these soil series consist of anywhere from 22 to 43 percent sand and 28 to 40 percent silt, depending on depth. The geotechnical report indicated that groundwater was reported at 50 feet below the ground surface at the site. In addition, soils encountered at the site were predominantly fine-grained and stiff. According to the geotechnical report, liquefaction poses a low risk to the Proposed Project (CGI 2014, p. 13). A less than significant impact would occur.

iv) The Project site is located in an area of little elevation gain. The Project site is located on a prominent knoll about 27 feet in height compared to the surrounding land. Surrounding land is relatively flat, and landslides from that area onto the Project site would not occur. Observations made at the site and review of aerial photographs did not identify geomorphic features that would be indicative of past or incipient slope failures (CGI 2014, p. 12).

Because of the low potential of seismic activity in the Project area and the relatively low elevation gain of the Project site, landslide potential is low, if not nonexistent, and therefore, a less than significant impact would occur.

b) Would the project result in substantial soil erosion or the loss of topsoil?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☒	☐

According to the Web Soil Survey completed for the Project site, the soils on the property have a slight to moderate erosion potential. Best management practices (BMPs) are required to be included as part of the stormwater pollution prevention plan (SWPPP) required for the Proposed Project and would be implemented to manage erosion and the loss of topsoil during construction-related activities (see subsection Hydrology and Water Quality (IX.)). The use of BMPs reduces the potential for soil erosion and result in a less than significant impact in this area.

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐

The Tehama County General Plan Draft EIR identifies areas in the county that have the potential for landslides, lateral spreading, subsidence, liquefaction, and collapse. As discussed previously, the Project site has little potential for landslides due to its location and minor elevation rise.

Lateral spreading is a form of horizontal displacement of soil toward an open channel or other “free” face, such as an excavation boundary. Lateral spreading can result from either the slump of low cohesion and unconsolidated material or, more commonly, by liquefaction of either the soil layer or a subsurface layer underlying soil material on a slope, resulting in gravitationally driven movement. One indicator of potential lateral expansion is frost action. Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing (USDA-NRCS 2014). The Web Soil Survey identifies the Project site as having soils with no frost action potential. Groundwater was reported at 50 feet below the ground surface at the site. In addition, soils encountered at the site were predominantly fine-grained and stiff. Because of those conditions, the geotechnical report determined that lateral spreading poses a low risk to the Proposed Project (CGI 2014, p. 13).

The Project site is located in an area of potential subsidence due to the extraction of groundwater (Tehama County 2008, Figure 4.6-3). With withdrawal of fluids, the pore spaces within the soils decrease, leading to a volumetric reduction. If that reduction is significant enough over an appropriately thick sequence of sediments, then regional ground subsidence can occur. This typically only occurs within poorly lithified sediments and not within competent rock.[2] No known oil, gas, or high-volume water extraction wells are known to be present in the Project area. The geotechnical report determined that regional ground subsidence due to fluid extraction is low (CGI 2014, p. 16).

According to the geotechnical report, hydrocollapse occurs when water is introduced to poorly cemented soils, resulting in the dissolution of the soil cementation and the volumetric collapse of the soil. In most cases, the soils are cemented with weak clay (argillic) sediments or soluble precipitates. This phenomenon generally occurs in granular sediments situated within arid environments. The

[2] The processes by which loose sediment is hardened to rock are collectively called lithification.

report determined that hydrocollapse poses a low risk to the Proposed Project. Therefore, a less than significant impact would occur.

d) Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	Potentially Significant Impact ☐	Less Than Significant Impact with Mitigation Incorporated ☐	Less Than Significant Impact ☒	No Impact ☐

Expansive soils can be determined by a soil's plasticity. There is a direct relationship between plasticity of a soil and the potential for expansive behavior, with expansive soil generally having a high plasticity. Thus, granular soils typically have a low potential to be expansive, whereas clay-rich soils can have a low to high potential to be expansive. According to the NRCS, Plasticity Indices values for the site range from about 15 to 32. Soils with Plasticity Indices in that range correlate to soils having a medium to high expansion potential, as noted below in Table 4.6-3.

Table 4.6-3
Expansion Potential Plasticity Index Correlation

Soil	Anita clay	Redding gravelly loam	Tuscan clay loam
Plasticity Index (USDA-NRCS)	32.5	15.4	19.3
Plasticity Index		**Correlated Expansion Potential**	
0–10		Very Low	
10–15		Low	
15–25		Medium	
25–35		High	
35+		Very High	

Source: USDA-NRCS 2014; CGI 2014

However, tests performed during the geotechnical report specific to soils found on the Project site found PIs ranging from non-plastic to about 10 (CGI 2014, p. 13). This would indicate a very low plasticity, resulting in a very low expansion potential for the Project site. Therefore, a less than significant impact would occur.

e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	Potentially Significant Impact ☐	Less Than Significant Impact with Mitigation Incorporated ☐	Less Than Significant Impact ☒	No Impact ☐

According to the Web Soil Survey, soils on the Project site are considered to be very limited as septic tank absorption fields. Table 4.6-4 shows this rating and the reasoning for the rating.

Table 4.6-4
Project Area Septic Characteristics

Soil	Rating[1]	Rating Reasons[1]
Anita clay	Very limited	Ponding (1.00) Depth to cemented pan (1.00) Depth to saturated zone (1.00)
Redding gravely loam	Very limited	Depth to cemented pan (1.00)
Tuscan clay loam	Very limited	Depth to cemented pan (1.00)

Source: USDA-NRCS 2014

Notes: 1. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The Project currently uses a septic disposal system. This system would be demolished with the redevelopment of the Project. A new standard septic system consisting of an approximately 600-foot leach field, a 1,500-gallon septic tank (minimum), and a 600-foot, 6-inch gravity main, or other appropriate system would be installed. While the Web Soil Survey indicates that soils on the Project site would be very limited as septic tank absorption fields, the existing septic system would indicate otherwise as there have been no issues with the existing leach field. All new proposed wastewater systems in Tehama County are required to be permitted and approved by the County Environmental Health Department. The permitting process requires percolation testing in order to ensure that the soil is capable of absorbing the waste. Septic systems in soils that are incapable of adequate waste absorption are not allowed. The Proposed Project would be required to undergo the Tehama County septic permitting process. If the Project site is determined to be incapable of supporting a septic system, then an alternative method of wastewater disposal acceptable to County standards would have to be explored. As such, the Project would have a less than significant impact in this area.

4.7 Greenhouse Gas Emissions

4.7.1 Environmental Setting

Since the early 1990s, scientific consensus holds that the world's population is releasing greenhouse gases (GHG) faster than the earth's natural systems can absorb them. These gases are released as byproducts of fossil fuel combustion, waste disposal, energy use, land-use changes, and other human activities. This release of gases, such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), and chlorofluorocarbons, creates a blanket around the earth that allows light to pass through but traps heat at the surface preventing its escape into space. While this is a naturally occurring process known as the greenhouse effect, human activities have accelerated the generation of GHGs beyond natural levels. The overabundance of GHGs in the atmosphere has led to an unexpected warming of the earth and has the potential to severely impact the earth's climate system.

For most nonindustrial development projects, motor vehicles make up the bulk of GHG emissions produced on an operational basis. The primary GHGs emitted by motor vehicles include carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons. Table 4.7-1 provides descriptions of the primary GHGs attributed to global climate change, including a description of their physical properties, primary sources, and contribution to the greenhouse effect.

Table 4.7-1
Greenhouse Gases

Greenhouse Gas	Description
Carbon dioxide (CO_2)	CO_2 is a colorless, odorless gas and is emitted in a number of ways, both naturally and through human activities. The largest source of CO_2 emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO_2 emissions. The atmospheric lifetime of CO_2 is variable because it is so readily exchanged in the atmosphere.[1]
Methane (CH_4)	CH_4 is a colorless, odorless gas that is not flammable under most circumstances. CH_4 is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. CH_4 is emitted from both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (livestock intestinal fermentation and manure management), biomass burning, and waste management. These activities release significant quantities of CH_4 to the atmosphere. Natural sources of CH_4 include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. Methane's atmospheric lifetime is about 12 years.[2]
Nitrous oxide (N_2O)	N_2O is a clear, colorless gas with a slightly sweet odor. N_2O is produced by natural and human-related sources. Primary human-related sources are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N_2O is approximately 120 years.[3]

Sources: [1]EPA 2011a, [2]EPA 2011b, [3]EPA 2010

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. Gases with high global warming potential (GWP), such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF_6), are the most heat-absorbent. CH_4 traps over 21 times more heat per molecule than CO_2, and N_2O absorbs 310 times more heat per molecule than CO_2. Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO_2e), which weight each gas by its GWP. Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

Regulatory Framework

Thresholds

Thresholds of significance illustrate the extent of an impact and are a basis from which to apply mitigation measures. Significance thresholds for GHG emissions resulting from land use development projects have not been established in Tehama County. In the absence of any GHG emission significance thresholds, the projected emissions are compared to the San Luis Obispo Air Pollution Control District–recommended threshold of 1,150 metric tons of CO2e annually. While significance thresholds used in Central California are not binding on the TCAPCD or projects in Tehama County, they are instructive for comparison purposes. The Project would be considered to have a significant impact if the projected emissions would surpass 1,150 metric tons of CO2e annually.

4.7.2 Greenhouse Gas Emissions (VII.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐

GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change. No single project could generate enough GHG emissions to noticeably change the global average temperature. The combination of GHG emissions from past, present, and future projects contributes substantially to the phenomenon of global climate change and its associated environmental impacts and as such is addressed only as a cumulative impact.

GHG emissions associated with the Project would occur over the short term from construction activities, consisting primarily of emissions from equipment exhaust. There would also be long-term regional emissions associated with Project-related new indirect source emissions, such as electricity usage for lighting.

Construction Emissions

Construction of the Proposed Project would result in direct emissions of GHGs from construction. The approximate quantity of annual GHG emissions generated by construction equipment utilized to build the Proposed Project is depicted in Table 4.7-2**.**

Table 4.7-2
Project Construction GHG Emissions – Metric Tons per Year

Construction Phase	Carbon Dioxide (CO_2)	Methane (CH_4)	Nitrous Oxide (N_2O)	CO_2e
Demolition[1]	38	0	0	38
Grading and Earthwork[2]	48	0	0	48
Building Construction and Facilities Placement[3]	174	0	0	174
Helipad Installation, Asphalt Paving, and SR 99 Improvements[4]	27	0	0	27
Construction Total	**287**	**0**	**0**	**287**

Source: Emissions modeled by PMC using the CalEEMod computer program. See Appendix A for modeling outputs.
[1] Emissions projected from demolition account for demolition of the barracks / administration building, two-bay apparatus building, storage building, wastewater system, perimeter and helicopter pad fence, helicopter pad, pavements, rock retaining wall, utilities, propane tanks, and helicopter hangar, as well as the removal of the fuel vault and jet fuel tank and pumps.
[2] Emissions projected from grading and earthwork includes grading of the entire 7.4-acre site in order to provide a conservative analysis.
[3] Emissions projected from building construction and facilities placement include the construction of a new barracks, three-bay apparatus building, pump generator/storage building, and hangar as well as the placement of two water tanks, a hose rack, training tower, a gasoline tank, and jet fuel tank.
[4] Emissions projected from this construction phase account for the pavement of 4.5 acres, which is conservative.

As shown, the Proposed Project would generate a total 287 metric tons of CO_2e during construction activities. To be conservative, total construction-generated GHG emissions were amortized over the estimated life of the Project and added to operational CO_2e emissions. A project life of 30 years was assumed for the Proposed Project.

Operational GHG Emissions

Emissions from long-term operations of the Project are shown in Table 4.7-3. However, it is noted that emissions would most likely not be greater than those associated with current operations since the Proposed Project is not anticipated to increase the amount of helitack base usage over existing conditions. While the Project would increase the intensity of the land use on the Project site (a larger barracks providing 22 beds instead of the existing 12 beds), the Project would not represent a new type of land use on the site or a wholly new land use or air emissions generation source, as the Project is the modernization of an existing facility as opposed to the construction of a wholly new facility. Furthermore, the new buildings would be designed to meet the US Green Building Council's LEED requirements to attain a Silver rating and to meet the State of California-DGS Tier 1 Energy and Sustainability lists. Tier 2 items would be considered in the design and implemented if cost effective. Finally, the Project includes the development of a solar array to assist in the reduction of electricity use at the site. The use of solar energy would also reduce the GHG emissions for the Project. Therefore, it is plausible that implementation of the Proposed Project would actually generate less demand for energy and thus less GHG emissions compared with existing conditions.

Table 4.7-3
Operational GHG Emissions – Metric Tons per Year

Source	CO_2	CH_4	N_2O	CO_2e
Construction (amortized over 30 years of project life)	10	0	0	10
Area	0	0	0	0
Energy	56	0	0	56
Solid Waste	2	0.1	0	4
Water	4	0.3	0	10
Traffic	0	0	0	0
Total	**72**	**0.4**	**0**	**80**

Source: Emissions modeled by PMC using the CalEEMod computer program. See Appendix A for modeling outputs.

As shown in Table 4.7-3, the long-term operations of the new buildings proposed under this Project could produce an additional 80 metric tons of CO_2e annually. The additional emissions projected from the potential for 10 extra vehicle trips are negligible (see Appendix A). 80 metric tons of CO_2e per year is less than the GHG threshold of 1,150 metric tons of CO_2e per year and therefore a less than significant impact.

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

The Project would not conflict with any adopted plans, policies, or regulations adopted for the purpose of reducing greenhouse gas emissions.

The Proposed Project is also subject to compliance with the Global Warming Solutions Act (Assembly Bill (AB) 32). As identified under Issue a), Proposed Project–generated GHG emissions would not surpass GHG significance thresholds, which were prepared with the purpose of complying with the requirements of AB 32. Therefore, the Proposed Project would not conflict with AB 32 and no impact would occur.

4.8 Hazards and Hazardous Materials

4.8.1 Environmental Setting

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency or if it has characteristics defined as hazardous by such an agency. A hazardous material is defined in Title 22 of the California Code of Regulations (CCR), Title 22, Section 662601.10, as follows:

> *A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed.*

Most hazardous material regulation and enforcement in Tehama County is managed by the County Environmental Health Department, which refers large cases of hazardous materials contamination or violations to the Central Valley Regional Water Quality Control Board (RWQCB) and the California Department of Toxic Substances Control (DTSC). When issues of hazardous materials arise, it is not at all uncommon for other agencies to become involved, such as the Tehama County Air Pollution Control District and both the federal and state Occupational Safety and Health Administrations.

Under Government Code Section 65962.5, both the DTSC and the State Water Resources Control Board (SWRCB) are required to maintain lists of sites known to have hazardous substances present in the environment. Both agencies maintain up-to-date lists on their websites. A search of the DTSC and SWRCB lists identified one open case of hazardous waste violations within 5 miles of the Project site (DTSC 2014; SWRCB 2014). This case, indicated as a land disposal site, is for the Bell Carter CLII Surface IMP located at Gardiner Ferry Road in Corning, more than 4 miles from the Project site.

As a part of the Project, Entek Consulting Group, Inc., completed a hazardous materials survey to determine the presence and extent of asbestos and lead-based paint (Entek 2014). See Appendix F for this report.

Asbestos refers to a family of fibrous minerals found all over world and in the serpentine rock that occurs throughout California. When the fibers break off and become airborne, they can create a health risk if inhaled. Asbestos exposure is associated with certain types of lung cancer, and long-time occupational exposure can also cause the lung disease asbestosis. Lead is a highly toxic metal that may cause a range of health problems, especially in young children. When lead is absorbed into the body, it can cause damage to the brain and other vital organs, like the kidneys, nerves, and blood. Lead may also cause behavioral problems, learning disabilities, seizures, and in extreme cases, death. Some symptoms of lead poisoning may include headaches, stomachaches, nausea, tiredness, and irritability.

Regulatory Framework

In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes, unless the person holds a valid registration issued by the DTSC. It is unlawful for any person to transfer custody of a hazardous waste to a transporter who does not hold a valid registration issued by the DTSC. Hazardous waste transporters must comply with the California Vehicle Code (CCR Title 13); California State Fire Marshal Regulations (CCR Title 19); US Department of

Transportation (DOT) Regulations, Title 49, Code of Federal Regulations; and US Environmental Protection Agency (EPA) Regulations, Title 40 CFR. In addition, hazardous waste transporters must comply with the Health & Safety Code and CCR Title 22, which are administered by the DTSC (DTSC 2007, p. 1). The California Highway Patrol is responsible for tanker truck inspections and permitting within the state.

4.8.2 Hazards and Hazardous Materials (VIII.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐

Implementation of the Project would require the removal of an existing above-ground fuel vault, jet fuel tank and pumps, and the removal of propane tanks. Fuel would be used to the extent possible and/or transferred to new tanks. Any remaining fuel would be required to be disposed of in accordance with DTSC regulations. If the removed tanks are not going to be reused for the same purpose, these tanks would be required to be disposed of in accordance with DTSC regulations.

Implementation of the Project would result in the use of two new 1,000-gallon propane tanks, a new 12,000-gallon above-ground jet fuel tank, and a new 2,000-gallon self-contained above-ground fuel tank, which would be internally divided to provide 1,000 gallons of diesel and 500 gallons of gasoline. The tanks would be specifically designed and certified for the purpose of fuel storage. Routine transportation of these fuels would occur in order to refill the tanks. Transportation of these fuels would be via an approved fuel transport truck that has been licensed specifically for this purpose. Fuel transportation is regulated by the DOT. The California Highway Patrol is responsible for tanker truck inspections and permitting within the state.

Because of existing requirements for the use, transport, and disposal of propane, diesel and gasoline, as well as jet fuel, the potential for significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous fuels is less than significant.

A stated previously, the hazardous materials survey completed for the Project determined the existence of asbestos as well as lead-based paint on the Project site. The results of testing for asbestos during this survey indicate asbestos is present in multiple materials and buildings on the Project site. Additionally, lead-based paint was found in multiple areas including the buildings and the striping paint on the asphalt and concrete.

Demolition of the Project buildings and asphalt and concrete areas would result in the potential exposure to a hazardous material and therefore require mitigation.

Mitigation Measure

HM-1 Removal of Asbestos and Lead-Based Paint

The Project applicant shall be required to retain an EPA-Certified Asbestos Professional and EPA Lead-Safe Certified contractor to prepare an Asbestos/Lead Paint Management Plan that includes lead and asbestos inspection notes and sampling results, as well as a Respiratory Protection Program, Medical Surveillance Requirements, an Injury and Illness Program,

asbestos-containing building materials disposal requirements, and a Periodic [Asbestos] Surveillance Schedule. All asbestos-containing building materials and lead identified in the Asbestos/Lead Paint Management Plan shall be removed and disposed of by an EPA-Certified Asbestos Professional and EPA Lead-Safe Certified contractor, as appropriate, in accordance with all state and federal regulations.

Timing/Implementation: Asbestos/Lead Paint Management Plan prior to demolition. Enforcement of removal practices during demolition activities

Monitoring/Enforcement: Department of Forestry and Fire Protection

b) Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☒	☐

Hazardous materials, such as diesel fuel and oil, would be used during construction, demolition, and operation and maintenance at the Project site. The release of any hazardous substance to the environment would be prevented through the implementation of BMPs listed in the SWPPP and SPCC Plan.

As described above in the discussion under a), routine use, storage, and handling of hazardous substances would be conducted in accordance with applicable federal, state, and local regulations. Hazards related to building and vehicle maintenance materials would be present at the Project site.

Because of existing requirements for the use and transport of propane, diesel, and gasoline, as well as jet fuel, the potential for significant hazards to the public, construction workers, and environment through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment would be reduced to a less than significant impact.

c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

There are no schools located within one-quarter mile from the Project site. The nearest school is Vina Elementary School, approximately 1.4 miles from the Project site. No impact would occur.

d) Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

According to the DTSC (2014) Envirostor database and the SWRCB (2014) GeoTracker database, there are no cases of hazardous waste violations within 4 miles of the Project site. No impact would occur.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

The Project site is more than 2 miles from any public or private airport. The closest airport to the site is the privately owned Deer Creek Ranch Airport, which is located approximately 2.25 miles to the east. The nearest public airport is the Corning Municipal Airport, located approximately 7.5 miles northwest of the Project site. No impact would occur.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☒	☐

The closest airport to the Project site is the privately owned Deer Creek Ranch Airport, which is located approximately 2.25 miles to the east. According to AirNav (2014), this airport is for private use only and includes one airport-based, single-engine aircraft. The airport sees little use. Because of the distance and the amount of use the airport receives, airport operation hazards to people residing or working on the Project site would be limited. As such, this would be a less than significant impact.

g) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☒	☐

State Route (SR) 99 would be used as a main evacuation route in the event of a needed evacuation of the area. The Project site is located adjacent to SR 99. While the majority of construction would occur on the Project site, part of the Project would be the addition of a left and right turn lanes and

widening of the roadway along the site frontage to accommodate those improvements. Construction on the Project site would not result in any impairments or interference of an evacuation route. During the construction of improvements to SR 99, the potential to interfere with a needed evacuation on SR 99 does exist. All construction would be required to adhere to Caltrans regulations regarding the impediment of traffic flow on SR 99. This construction would be designed to minimally impact traffic flow on the highway and once completed, would result in better flow and highway safety by adding dedicated turning lanes in an area where they currently do not exist. Additionally, this construction would be for a relatively short time period and would not result in a change to an adopted emergency response or evacuation plan. As such, this is considered a less than significant impact.

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
h) Would the project expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

According to the map of Fire Hazard Severity Zones for Tehama County, the Project site is in an area considered to be at risk of moderate fire severity (CAL FIRE 2007). While this may be of some concern, because the Project would be occupied as a CAL FIRE facility, the site would be developed and maintained with wildland fire protection in mind, such as a defensive zone, according to CAL FIRE standards and would also have fire equipment stationed on site. A less than significant impact would occur.

4.9 Hydrology and Water Quality

4.9.1 Environmental Setting

Regional Hydrology

Surface Water

The Project site is located within the Sacramento River Hydrologic Region, which covers approximately 17.4 million acres (27,200 square miles) (DWR 2003, p. 158). The region includes all or large portions of Modoc, Siskiyou, Lassen, Shasta, Tehama, Glenn, Plumas, Butte, Colusa, Sutter, Yuba, Sierra, Nevada, Placer, Sacramento, El Dorado, Yolo, Solano, Lake, and Napa counties.

The Project site lies within the Tehama East Watershed Management Plan area, which is part of the greater Sacramento River Hydrologic Region. The Tehama East Watersheds are located in Northern California along the eastern edge of the Sacramento Valley. They are bordered by the Battle Creek watershed to the north, by Butte County to the east and south, and by Plumas County to the east, while the Sacramento River to the west terminates the flow of these water courses associated with the Tehama East Watershed Assessment. The Tehama East Watersheds encompass 441,769 acres and comprise the Antelope Creek watershed, Dye Creek watershed, Hoag Slough watershed, Inks Creek watershed, Paynes Creek watershed, Paynes Slough watershed, Salt Creek watershed, Seven Mile Creek watershed, and Toomes Creek watershed (Tehama County 2010, p. 1-4). Specifically, the Project site is located in the Hoag Slough watershed, which covers approximately 12,764 acres

(Tehama County 2010, p. 1-40). According to the Tehama East Watershed Management Plan, many of the watersheds of Tehama East are relatively low in elevation and therefore receive little precipitation in the form of snowfall. In fact, six of the ten watersheds are below 4,000 feet at their highest points. This tends to create a situation where flows are flashy and brief, especially for some of the smaller watersheds (Tehama County 2010, p. 1-4).

Groundwater

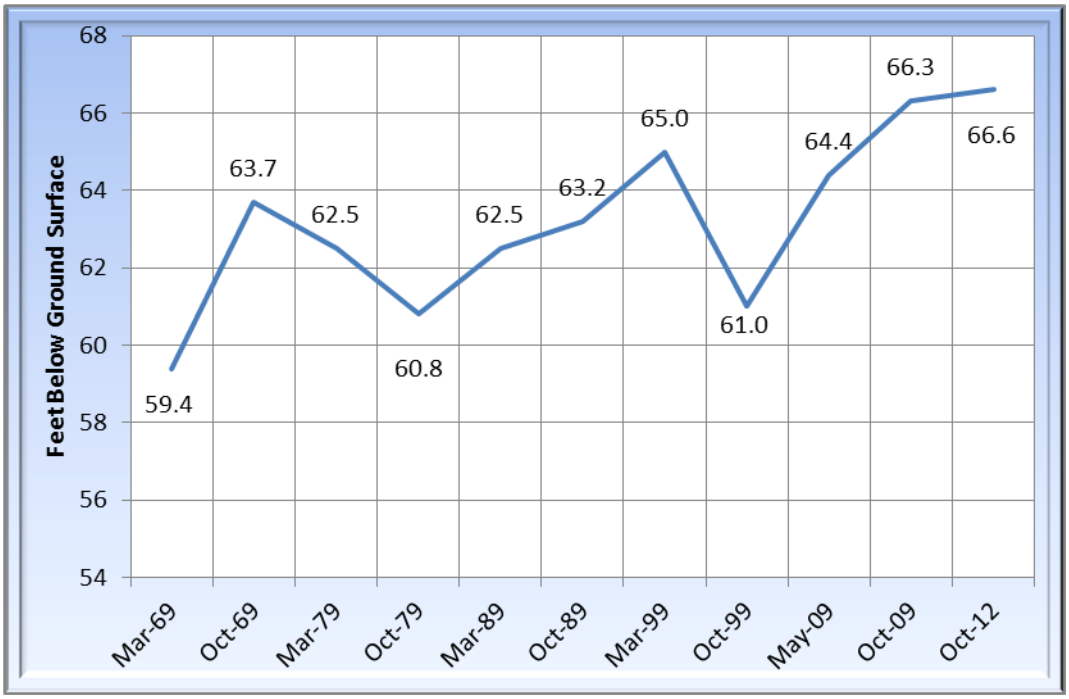
As stated previously, the Project site is located within the Sacramento River Hydrologic Region. There are 88 groundwater basins/sub-basins delineated in the region. These basins underlie 5.053 million acres (7,900 square miles), about 29 percent of the entire hydrologic region (DWR 2003, p. 159). Analyses conducted in 2005 by the Department of Water Resources (DWR) Northern Region Land and Water Use Section indicated that about 69 percent (257,000 acre-feet) of Tehama County's total annual water demand is from groundwater (Tehama County 2012b, p. 37). The total number of wells constructed in Tehama County was estimated at over 13,000 in 2011 (Tehama County 2012b, p. 37).

The Project area is located within the Vina groundwater subbasin (5-21.57) of the Sacramento River Hydrologic Region as described in California Department of Water Resources Bulletin 118 (DWR 2003, p. 157). The Vina subbasin is bounded on the north by Deer Creek (a groundwater recharge boundary), on the south by the Big Chico Creek/Little Chico Creek system, on the east by the Chico Monocline (a geologic structure), and on the west by the Sacramento River. Groundwater flow is westerly toward the Sacramento River. Again, the direction of groundwater flow roughly parallels the boundary line shared with Butte County, which suggests that subsurface flow across the county line may be minimal in the alluvial deposits (Tehama County 2012b, p. 28).

The groundwater depth around the Project site was about 60 feet during the spring of 2000 (DWR 2003). The information available at the Project site is not as defined in the 2010 report; however, groundwater depth was estimated to be between 50 and 70 feet during the spring of 2010 (DWR 2014).

Historical groundwater information for the water well at the site was obtained from the California Department of Water Resources (2014) and identified that groundwater depth ranged from 57.0 feet (6/2/1999) to 71.3 feet (7/6/2000) below ground surface. Figure 6 below identifies the groundwater levels at the site since 1969. As is shown, the depth to groundwater has increased by approximately 7 feet since 1969.

Figure 6. Historical Groundwater Levels at Project On-Site Well (Well No. 399290N1220275W001)



Source: DWR 2014
Notes: No information regarding depth to groundwater is available for March 2009 or March 2012.

Flooding

The Project site is not subject to flooding. According to the Federal Emergency Management Agency (FEMA) (2011) Flood Insurance Rate Map No. 06103C1495H, the site is located in the unshaded Zone X flood area, areas determined to be outside the 0.2 percent annual chance floodplain.

Site Hydrology and On-Site Drainage

No creeks or lakes exist on the Project site. The Project sits within the Vina Plains, which are a naturally occurring annual grassland and vernal pool complex located in northern Butte and southern Tehama counties located on the upper terrace of the Sacramento Valley floor. A wetlands assessment was performed at the site. A total of 0.019 acre of waters of the United States has been mapped, including a seasonal wetland and ditches.

Drainage within the development area occurs as sheetflow in all directions. Water flowing to the north, east, and south drains onto the surrounding plains. Water flowing to the west drains into drainage swales located along the east side of State Route (SR) 99, where it is eventually discharged into drainages crossing the highway (CGI 2014, p. 4).

Regulatory Framework

State Water Resources Control Board

In 1972, the CWA was amended to prohibit discharge of pollutants to waters of the United States from any point source unless it is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. In 1987, further amendments to the CWA added Section 402(p) and established a framework for regulating municipal and industrial stormwater discharges under the NPDES Program. On November 16, 1990, the EPA finalized regulations establishing stormwater permit requirements for specific industries. These regulations provide that stormwater discharges to Waters of the United States from construction projects with five or more acres of soil disturbance be prohibited unless the discharge is in compliance with an NPDES Permit. Further regulations (titled the Phase II Rule), which became final on December 8, 1999, lowered the permitting threshold from 5 acres to 1 acre.

While EPA regulations allow two permitting options for stormwater discharges (Individual Permits and General Permits), the California State Water Resources Control Board (SWRCB) has elected to adopt only one statewide General Permit that applies to the majority of stormwater discharges associated with construction activities. On August 19, 1999, the SWRCB reissued the General Construction Storm Water Permit (Water Quality Order 99-08-DWQ). On December 8, 1999, the SWRCB amended Order 99-08-DWQ to apply to sites as small as 1 acre (SWRCB 2010).

The latest General Construction Permit (Order No. 2009-0009-DWQ), which the Proposed Project would comply with, was adopted September 2, 2009. The order created several new significant changes, including formal training requirements, online permitting/SWPPP documentation upload, minimum BMPs, and Numeric Action Levels for pH and turbidity, as well as monitoring based on Project risk to sediment loss and threat to receiving waters (SWRCB 2010).

4.9.2 Hydrology and Water Quality (IX.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐

Development of the Project would include the installation of a new stormwater collection system. This system would consist of approximately 300 feet of 12-foot underground storm drain, four drain inlets, 500 feet of 6-inch drain connecting building downspouts, and surface water swales to connect to existing drainage systems. Vehicle washing would be provided on the exterior concrete aprons at the front and back of the Apparatus Bay Building.

The Proposed Project would not contribute to wastewater flows or discharge from a wastewater treatment plant. All wastewater would be directed into the new on-site wastewater system. The proposed standard septic system would consist of an approximately 600-foot leach field, a 1,500-gallon septic tank (minimum), and a 600-foot 6-inch gravity main. All new proposed wastewater systems in Tehama County are required to be permitted and approved by the County Environmental Health Department. The permitting process requires percolation testing in order to ensure that the soil is capable of absorbing the waste. Septic systems in soils that are incapable of adequate waste absorption are not allowed. The Proposed Project would be required to undergo the Tehama County septic permitting process.

Additionally, in accordance with NPDES regulations, the State of California requires that any construction activity affecting 1 acre or more obtain a General Construction Activity Stormwater Permit (General Permit) to minimize the potential effects of construction runoff on receiving water quality. Performance standards for obtaining and complying with the General Permit are described in NPDES General Permit No. CAS000002, Waste Discharge Requirements, Order No. 2009-0009-DWQ.

General Permit applicants are required to submit to the appropriate regional board Permit Registration Documents (PRDs) for the project, which include a Notice of Intent (NOI), risk assessment, site map, signed certification statement, an annual fee, and a stormwater pollution prevention plan (SWPPP). The SWPPP includes pollution prevention measures (erosion and sediment control measures and measures to control non-stormwater discharges and hazardous spills), demonstration of compliance with all applicable local and regional erosion and sediment control standards, identification of responsible parties, and a detailed construction timeline. The SWPPP must also include implementation of best management practices (BMPs) to reduce construction effects on receiving water quality by implementing erosion control measures and reducing or eliminating non-stormwater discharges.

Examples of typical construction best management practices included in SWPPPs include, but are not limited to, using temporary mulching, seeding, or other suitable stabilization measures to protect uncovered soils; storing materials and equipment to ensure that spills or leaks cannot enter the storm drain system or surface water; developing and implementing a spill prevention and cleanup plan; and installing sediment control devices such as gravel bags, inlet filters, fiber rolls, or silt fences to reduce or eliminate sediment and other pollutants from discharging to the drainage system or receiving waters. Stormwater pollution prevention plan BMPs are recognized as effective methods to prevent or minimize the potential releases of pollutants into drainages, surface water, or groundwater. Strict SWPPP compliance, coupled with the use of appropriate BMPs, would reduce potential water quality impacts during construction activities.

Implementation of best management practices required as part of the SWPPP would ensure that the Proposed Project would not create or contribute to any violations of water quality standards or waste discharge requirements. There would be a less than significant impact.

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐

Currently, the Vina Helitack Base uses groundwater at its only source of potable water. The on-site existing well has been monitored for many years by the DWR. As is shown in Chart 4.9-1 above, the depth to groundwater has increased by approximately 7 feet since 1969. However, this increase is not solely due to the groundwater pumped at the site but due to the over 13,000 wells used for groundwater in Tehama County, as well as the recent drought conditions throughout California, including in the Sacramento River Hydrological Region. The Project would replace the existing well

with a new well and water filtration system. However, construction of the new well would not increase the amount of groundwater used at the site. The new well would only be constructed in order to replace an old well system.

During the peak fire season period, the typical daily facility crew comprises two fire captains, one fire apparatus engineer, six firefighters, and one helicopter pilot. During the non-peak fire season, daily staffing totals four personnel, generally consisting of a fire captain, two firefighters, and one pilot. During a maximum fire event, staffing could include up to 20 overnight personnel (including existing base personnel), 40 daytime personnel including up to five general staff personnel, five engine strike team personnel, two water-tender operators, one bulldozer operator, and seven Type II helicopter pilots. While the barracks would be increased to 22 beds, thus potentially result in greater water demand, this increase would not increase the number of personnel who periodically use the facility, only provide for better accommodations for the personnel. Thus, actual water demand would not increase substantially.

The Proposed Project is for the redevelopment of an existing helitack facility. Actual impervious ground coverage may increase slightly with development of the Project, however, not to the extent to interfere substantially with groundwater recharge. Additionally, because the Project site is on a 27-foot-high knoll, all stormwater drains off the site fairly quickly and thus limits the amount of potential recharge. As such, implementation of the Proposed Project would have a less than significant impact regarding groundwater recharge.

c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

As previously stated, there are no streams, rivers, or other water courses on the Project site. Therefore, no alteration of these types of water features or increase in on- or off-site erosion or siltation would occur with development of the Project. All new drainage facilities would flow into existing facilities; thus, the existing drainage pattern would be similar to the existing facilities. The Project would have no impact in this area.

d) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

As previously stated, there are no streams, rivers, or other water courses on the Project site. Therefore, no alteration of these types of water features or increase in runoff would occur with development of the Project. All new drainage facilities would flow into existing facilities; thus, the

existing drainage pattern would be similar to the existing facilities and would not result in flooding on- or off-site. The Project would have no impact in this area.

e) Would the project create or contribute runoff water, which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

The only stormwater drainage facilities on the Project site or in the general area of the Project site are those of the Project itself. Development of the Project would include the installation of a new stormwater collection system. This system would consist of approximately 300 feet of 12-inch underground storm drain, four drain inlets; 500 feet of 6-inch drain connecting building downspouts, and surface water swales to connect to existing drainage systems. Development of the Proposed Project would not exceed the capacity of the planned stormwater drainage facilities, as the facilities are designed to control stormwater runoff coming from the Project site. Because there are no other drainage facilities in the area, development of the Project would not affect or create substantial additional sources of polluted runoff to any other facilities. The Project would have no impact in this area.

f) Would the project otherwise substantially degrade water quality?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☒	☐

Existing and proposed stormwater and wastewater facilities as well as adherence to the NPDES requirements would control polluted sources of water that would further degrade water quality. The Project would have a less than significant impact in this area.

g) Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

The Project is not located in a 100-year flood hazard area, as discussed previously. The Project would have no impact in this area.

h) Would the project place within a 100-year flood hazard area structures that would impede or redirect flood flows?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

The Project is not located in a 100-year flood hazard area, as discussed previously. The Project would have no impact in this area.

i) Would the project expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

According to the Tehama County General Plan Draft EIR, dam failure is a potential hazard in Tehama County. Larger dams that would inundate significant portions of the county include Shasta Dam (in Shasta County), Red Bluff Diversion Dam on the Sacramento River, and Black Butte Dam on Stony Creek. The areas in the county most threatened by dam inundation are the incorporated and unincorporated areas along the Sacramento River corridor, including Red Bluff and Tehama (Tehama County 2008, p. 4.8-36). The Shasta Dam inundation area represents the largest area in the county susceptible to dam inundation. According to the Tehama County Flood Mitigation Plan, the Project site is not located within a Shasta Dam inundation area (Tehama County 2006, map 9). Failure of the Red Bluff Diversion Dam or the Black Butte Dam would not impact the Project site. Implementation of the Project would have no impact in this area.

j) Would the project be subject to inundation by seiche, tsunami, or mudflow?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☒	☐

Tsunamis occur due to subaqueous seismic activity and submarine landslides generating long period waves in the ocean that run up onshore and potentially cause tremendous damage and loss of life. Because of the Project's separation from the Pacific Ocean, tsunamis pose no risk to the Project.

Seiches are waves that develop in landlocked bodies of water due to distant or near source earthquakes and from wind shear. Those waves can cause overtopping of impoundments and inundation to adjacent and downstream lands. The Project site is not located below or adjacent to landlocked bodies of water. Therefore, seiche inundation is not anticipated to pose a risk to the Project.

Mudflows occur on steep slopes where vegetation is not sufficient to prevent rapid erosion but can also occur on gentler slopes if other conditions are met such as heavy precipitation in a short period of time and on an easily erodible material. The Project site has been occupied for many years and is not located in an area susceptible to mudflows. While the potential for mudflow is considered minimal, the geotechnical report prepared for the Project provides recommendations on grading, compaction, soil materials, and other site preparation guidance, which would remove the potential for mudflow on the site.

4.10 Land Use and Planning

4.10.1 Environmental Setting

The Project site is owned by the State of California. State-owned lands are under the jurisdiction of the State and are not controlled by local land use or zoning designations. However, as a matter of procedure, consistency with local designations is preferred. The Proposed Project is located in Tehama County. The Tehama County General Plan land use designation of the site, as well as for the surrounding area, is Valley Floor Agriculture. The site is identified as being in the Tehama County Agricultural/Valley District (A-2) zoning district.

4.10.2 Land Use and Planning (X.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project physically divide an established community?	☐	☐	☐	☒

The Proposed Project is for the redevelopment of the existing CAL FIRE Vina Helitack Base. This base is located in an area that is sparsely settled and has no communities surrounding the Project site. The Project would not physically divide an established community. No impact would occur.

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

The Proposed Project is for the redevelopment of an existing use on State-owned land. While the Project site is located in an area identified as Valley Floor Agriculture on the Tehama County General Plan land use map, State-owned land is under the jurisdiction of the State of California, not under the jurisdiction of a county. Further, while the use of the Project site as a CAL FIRE helitack base is not identified as a permitted use allowed under the Tehama County land use designation and zoning, the base has been in existence at the site since 1974 and has not resulted in any conflicts with the local land use designations and zoning since that time. As such, the Proposed Project would have no impact in this area.

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Would the project conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

There are no adopted habitat conservation plans or natural community conservation plans in Tehama County. Therefore, implementation of the Proposed Project would not conflict with these plans. No impact would occur.

4.11 Mineral Resources

4.11.1 Environmental Setting

The majority of Tehama County's mineral wealth is derived from the extraction of non-metallic sand, gravel, and volcanic cinder, which are used primarily by local paving and construction industries. Other mineral resources found in the county include aragonite, borax, chalcopyrite, chromite, copper, cristobalite, galena, garnet, opal, pectolite, penninite, sassolite, and wallstonite. Of these, chromite offers the most possibilities for development.

The Project site is not located in an area identified as a mineral resource area by Tehama County.

Regulatory Framework

<u>The Surface Mining and Reclamation Act</u>

Requirements to the Surface Mining and Reclamation Act of 1975 state that cities and counties must adopt an ordinance(s) "which establishes procedures for the review and approval of reclamation plans and the issuance of a permit to conduct surface mining operations" (PRC Section 2774). The intent of this legislation is to ensure the prevention or mitigation of the adverse environmental impacts of mining, the reclamation of mined lands, and the production and conservation of mineral resources are consistent with recreation, watershed, wildlife, and public safety objectives (PRC Section 2712).

4.11.2 Mineral Resources (XI.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒

The Project site is not located in an area identified as having a known mineral resource. The Project would have no impact in this area.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
b)	Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

The Project site is not located in an area identified as a mineral resource in the Tehama County General Plan, a specific plan, or other land use plan. The Project would have no impact in this area.

4.12 Noise

4.12.1 Environmental Setting

A noise assessment was completed for the Proposed Project by J.C. Brennan & Associates (Brennan 2014; **Appendix G**). The assessment evaluated the Project's potential to produce noise-related impacts, and the information provided in the assessment is summarized below.

Noise Background

Noise is typically defined as airborne sound that is loud, unpleasant, unexpected, or undesired, and would therefore be classified as a more specific group of sounds. The perception of a noise nuisance is highly subjective. For example, one person's acceptable level of sound coming from a radio may be described as too loud by another person. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dBA. The perceived loudness of sounds is dependent on many factors, including sound pressure level and frequency content. However, in the usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment (Brennan 2014, p. 5).

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A-weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, and shows very good correlation with community response to noise (Brennan 2014, p. 5).

The day/night average level (L_{dn}) is based on the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based on the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment. Table 4.12-1 lists several examples of maximum noise levels associated with common noise sources.

Table 4.12-1
Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft.)	--100--	
Gas Lawn Mower at 1 m (3 ft.)	--90--	
Diesel Truck at 15 m (50 ft.) at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft.) Garbage Disposal at 1 m (3 ft.)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft.)	--70--	Vacuum Cleaner at 3 m (10 ft.)
Commercial Area	--60--	Normal Speech at 1 m (3 ft.)

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Heavy Traffic at 90 m (300 ft.)		
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Brennan 2014, Table 1

Effects of Noise on People

The effects of noise on people can be placed in three categories:

1. Subjective effects of annoyance, nuisance, and dissatisfaction
2. Interference with activities such as speech, sleep, and learning
3. Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise would be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived.
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference.
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected.
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise—including stationary mobile sources such as idling vehicles—attenuate (lessen) at a rate of approximately 6 dBA per doubling of distance from the source, depending on environmental conditions (i.e., atmospheric conditions and either vegetative or manufactured noise barriers). Widely distributed noises, such as a large industrial facility spread

over many acres, or a street with moving vehicles, would typically attenuate at a lower rate (Brennan 2014, p. 7).

Vibration Standards

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. A person's perception to the vibration would depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 4.12-2 indicates that the threshold for damage to structures ranges from 2 to 6 peak particle velocity in inches per second (in/sec ppv). One-half this minimum threshold, or 1 in/sec ppv, is considered a safe criterion that would protect against architectural or structural damage. The general threshold at which human annoyance could occur is noted as 0.1 in/sec ppv (Brennan 2014, p. 15).

Table 4.12-2
Effects of Vibration on People and Buildings

Peak Particle Velocity		Human Reaction	Effect on Buildings
in/sec	mm/sec		
0.15–0.30	0.006–0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type,
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected,
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings,
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling—houses with plastered walls and ceilings. Special types of finish such as lining of walls and flexible ceiling treatment, would minimize "architectural" damage,
10–15	0.4–0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage.

Source: Brennan 2014, p. 15

Regulatory Framework

State of California Public Utilities Code

The state legislative authority to adopt noise standards governing the operation of aircraft and aircraft engines for airports is provided in Section 21669, Article 3, Chapter 4, Part 1, Division 9 of

the Public Utilities Code (Aeronautics Law). The California Department of Transportation (Caltrans) Division of Aeronautics is the agency responsible for compliance with this code section.

The Public Utilities Code differentiates emergency service helicopters from other aircraft by providing exemptions from local ordinances. Section 21662.4(a), Article 3, Chapter 4, Part 1, Division 9 of the code states the following concerning exemptions from the noise ordinances:

> *Emergency aircraft flights for medical purposes by law enforcement, fire fighting, military, or other persons who provide emergency flights for medical purposes are exempt from local ordinances adopted by a city, county, or city and county, whether general law or chartered, that restricts flight departures and arrivals to particular hours of the day or night, that restrict the departure or arrival of aircraft based upon the aircraft's noise level, or that restrict the operation of certain types of aircraft.*

Caltrans Division of Aeronautics

The Caltrans Division of Aeronautics (DOA) has adopted the Community Noise Equivalent Level (CNEL) as the noise descriptor to be used in describing the noise impact boundary of California airports. The DOA has identified a CNEL value of 65 dB as the noise impact criterion for noise-sensitive land uses, such as single-family or multi-family dwellings. The CNEL is typically about 1 dB more than the L_{dn} because it applies an additional penalty for noise sources between the hours of 7:00 p.m. and 10:00 p.m. The L_{dn} descriptor only applies a penalty to noise levels between the hours of 10:00 p.m. and 7:00 a.m.

The DOA also regulates helicopter landing facilities through the issuance of State Heliport Permits (SHP). The DOA has determined that the existing facility is a regulated facility, designated as a Special-Use heliport facility not subject to use by the general public. Regulated facilities are required to secure a SHP from the DOA to ensure that safe air space has been designated for the use, appropriate navigational aids and markings are present, and that the facility meets with state design standards. Prior to the issuance of an SHP for a new or expanded facility falling under the jurisdiction of the DOA, applicants must submit an application with documentation showing that the facility complies with state regulations. This includes documentation from the local land use regulatory body (Tehama County) acknowledging that the facility is acceptable and meets local regulations and guidelines.

Tehama County General Plan

The Tehama County General Plan includes the following policies regarding acceptable noise levels in the county:

Policy N-3.1: The interior and exterior noise level standards for noise-sensitive areas of new uses affected by traffic or railroad noise sources in Tehama County are depicted in Table 9.2 [shown as Table 4.12-3 below].

Table 4.12-3
Noise Standards for New Uses by Traffic and Railroad Noise

New Land Uses	Outdoor Activity Area – L_{dn}	Interior – L_{dn}/Peak Hour L_{eq}[1]	Notes
All Residential	60–65	45	2, 3, 4
Transient Lodging	65	45	5
Hospitals & Nursing Homes	60	45	6
Theaters & Auditoriums	—	35	
Churches, Meeting Halls, Schools, Libraries, etc.	60	40	
Office Buildings	65	45	7
Commercial Buildings	65	50	7
Playgrounds, Parks, etc.	70	—	
Industry	65	50	7

Notes:
1. For traffic noise within Tehama County, L_{dn} and peak-hour L_{eq} values are estimated to be approximately similar. Interior noise level standards are applied within noise-sensitive areas of the various land uses, with windows and doors in the closed position.
2. Outdoor activity areas for single-family residential uses are defined as back yards. For large parcels or residences with no clearly defined outdoor activity area, the standard shall be applicable within a 100-foot radius of the residences.
3. For multi-family residential uses, the exterior noise level standard shall be applied at the common outdoor recreation area, such as at pools, play areas, or tennis courts.
4. Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn} or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn} may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.
5. Outdoor activity areas of transient lodging facilities include swimming pool and picnic areas.
6. Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relation by either hospital staff or patients.
7. Only the exterior spaces of these uses designated for employee or customer relaxation have any degree of sensitivity to noise.

Source: Tehama County 2009

Policy N-4.2: The interior and exterior noise level standards for noise-sensitive areas of new uses affected by non-transportation noise sources within Tehama County are depicted in Table 9.3 (shown as Table 4.12-4 below).

Table 4.12-4
Noise Standards for New Uses Affected by Non-Transportation Noise

New Land Use	Outdoor Activity Area – L_{eq}		Interior – L_{eq}	
	Daytime	Nighttime	Day & Night	Notes
All Residential	50	45	35	1, 2, 7
Transient Lodging	55	—	40	3
Hospitals & Nursing Homes	50	45	35	4
Theaters & Auditoriums	—	—	35	
Churches, Meeting Halls, Schools, Libraries, etc.	55	—	40	
Office Buildings	55	—	45	5, 6
Commercial Buildings	55	—	45	5, 6
Playgrounds, Parks, etc.	65	—	—	6
Industry	65	65	50	5

Notes:
1. Outdoor activity areas for single-family residential uses are defined as back yards. For large parcels or residences with no clearly defined outdoor activity area, the standard shall be applicable within a 100-foot radius of the residences.

New Land Use	Outdoor Activity Area – L_{eq}		Interior – L_{eq}	
	Daytime	Nighttime	Day & Night	Notes

2. For multi-family residential uses, the exterior noise level standard shall be applied at the common outdoor recreation area, such as at pools, play areas, or tennis courts. Where such areas are not provided, the standards shall be applied at individual patios and balconies at the development.
3. Outdoor activity areas of transient lodging facilities including swimming pool and picnic areas, and are not commonly used during nighttime hours.
4. Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.
5. Only the exterior spaces of these uses designated for employee or customer relaxation have any degree of sensitivity to noise.
6. The outdoor activity areas of office, commercial and park uses are not typically utilized during nighttime hours.
7. It may not be possible to achieve compliance with this standard at residential uses located immediately adjacent to lodging dock areas of commercial uses while trucks are unloading. The daytime and nighttime noise level standards applicable to loading docks shall be 55 and 50 dB L_{eq}, respectively.

General: The Table 9.3 standards shall be reduced by 5 dB for sounds consisting primarily of speech or music, and for recurring impulsive sounds.

If the existing ambient noise level exceeds the standards of Table 9.3, then the noise level standards shall be increased at 5 dB increments to encompass the ambient.

Source: Tehama County 2009

Policy N-5.1: The County shall work to keep current and implement the noise policies in the "Impact of Airport Noise on Land Use" Table 9-4 [shown as Table 4.12-5 below].

Implementation Measure N-5.1a

Review all development proposals to ensure compliance with the TCACLUP. Compliance shall include:

a. Airport/Land Use noise compatibility shall be evaluated in terms of the Community Noise Equivalent Level (CNEL), as defined in Title 21 of the California Administration Code.

b. The maximum noise exposure that shall be considered normally acceptable for residential areas is 60 dBA CNEL.

c. The relative acceptability or unacceptability of particular land uses with respect to the noise levels to which they would be exposed as indicated in the "Impact of Airport Noise on Land Use Types" matrix. These criteria shall be the principal determinants of whether a proposed land use is compatible with the noise impact from a nearby airport, but special circumstances, which would affect the specific proposal's noise sensitivity (e.g., the extent or lack of outdoor activity), also shall be taken into account.

d. One of the conditions for approval of a land use which is "marginally acceptable" or "normally unacceptable" for the given noise environment is that the building must provide a satisfactory degree of noise attenuation (see Table 4.12-3, Land Use Acceptability Definitions). If the structure can reduce the noise exposure to the indicated level, the use may be acceptable. It should be noted that the interior noise criteria are measured in terms of maximum noise levels of individual events and not average noise levels as represented by CNEL values. Since maximum exterior individual even noise levels are greater than the CNEL value at a given location, the required noise

reduction of the structure thus will be greater than the difference between the interior noise level criterion and the CNEL value.

e. In applying the interior noise level criteria, engine run-up noise shall be considered as a source of commonly occurring exterior noise.

f. When applying the noise compatibility criteria to a given location, the basis for evaluation shall be the maximum Community Noise Equivalent Level to which the location is or is forecast to be exposed.

g. If a noise analyses, including noise monitoring, is conducted for a particular location and the results indicate that the maximum CNEL will be less than shown herein, the lower exposure level may be used for the land use evaluation at the discretion of the Airport Land Use Commission.

Table 4.12-5
Impact of Airport Noise on Land Use

Land Use Category	CNEL or LDN, dBA 1				
	50–55	55–60	60–65	65–70	70–75
Residential					
Single-family detached and duplexes	+	0	♦	♦♦	♦♦
Multi-family and transient lodging	+ +	+	0	♦	♦
Mobile homes	+	♦	♦	♦♦	♦♦
Public					
School, libraries, hospitals, nursing homes	+	0	♦	♦	♦♦
Churches, auditoriums, concert halls	+	0	0	♦	♦♦
Transportation, parking, cemeteries	+ +	+ +	+ +	+	0
Commercial and Industrial					
Offices, retail	+ +	+	0	0	♦
Service commercial, wholesale trade, warehousing, light industrial	+ +	+ +	+	0	0
General manufacturing, utilities, extractive industry	+ +	+ +	+ +	+	+
Agricultural and Recreational					
Cropland	+ +	+ +	+ +	+ +	+
Livestock breeding	+ +	+	0	0	♦
Parks, playgrounds, zoos	+ +	+	+	0	0
Golf courses, riding stables, water recreation	+ +	+ +	+	0	0
Outdoor spectator sports	+ +	+	+	0	♦
Amphitheaters	+	0	♦	♦♦	♦♦

Land Use Acceptability	Interpretations / Conditions
+ + Clearly Acceptable	The activities associated with the specified land use can be carried out with essentially no interference from the noise exposure.
+ Normally Acceptable	Noise is a factor to be considered in that slight interference with outdoor activities may occur. Normal Construction methods would eliminate most noise intrusions upon indoor activities.
0 Marginally Acceptable	The indicated noise exposure would cause moderate interference with outdoor activities and indoor activities with windows open. This is acceptable upon the conditions that outdoor activities are minimal and construction features which provide for sufficient noise attenuation are used. Under other circumstances, the land use should be discouraged.
♦ Normally Unacceptable	Noise would create substantial interference with both outdoor and indoor activities. Noise intrusion upon indoor activities can be mitigated by requiring special noise insulation construction. Land uses which have conventionally constructed structures and/or involve outdoor activities which would be disrupted by noise should generally be avoided.

Land Use Category		CNEL or LDN, dBA 1				
		50–55	55–60	60–65	65–70	70–75
◆◆ Clearly Unacceptable	Unacceptable noise intrusion upon land use activities would occur. Adequate structural noise insulation is not practical under most circumstances. This land use should be avoided unless strong overriding factors prevail.					

Source: Tehama County 2009

4.12.2 Noise (XII.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐

Short-Term Noise Impacts

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, and paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Although noise ranges are generally similar for all construction phases, the initial site preparation phase tends to involve the most heavy-duty equipment having a higher noise-generation potential. Activities involved in construction would generate maximum noise levels ranging from 78 to 85 dBA at a distance of 50 feet (Brennan 2014, p. 17). Construction activities would be temporary in nature and are anticipated to occur during normal daytime working hours.

Noise would also be generated during the construction phase by increased truck traffic on area roadways. A significant project-generated noise source would be truck traffic associated with the transport of heavy materials and equipment to and from construction sites. This noise increase would be of short duration and would likely occur primarily during daytime hours.

The nearest residential receptors are located approximately 2,400 feet south of the Project site. At this distance, construction activities are not predicted to cause any substantial increase in ambient noise or be a source of annoyance to residents. Therefore, no additional noise control measures would be required.

Helipad Noise Impact

The Proposed Project does not include increased helicopter operations. The Proposed Project includes replacement of the primary helipad and construction of a new secondary helipad. This secondary pad would primarily be used to park aircraft, not to accommodate increased operations. Therefore, no substantial change in CNEL noise contours is expected to be associated with the Project. However, in order to show the noise exposure associated with helicopter operations, CNEL noise contours were modeled for the Project. The contours, which are shown in Appendix G and Figures 3, 4, and 5, include CNEL contours for three different operating scenarios, as outlined below.

Scenario 1 – Typical Off-Season Operations

- 1–2 daily flights
- All operations typically within the daytime hours of (7:00 a.m. to 10:00 p.m.)

Scenario 2 – Typical Fire Season Operations

- 10–12 daily flights
- All operations typically within the daytime hours of (7:00 a.m. to 10:00 p.m.)

Scenario 3 – Maximum Event Operations

- 30 daily flights
- All operations typically within the daytime hours of (7:00 a.m. to 10:00 p.m.)

As indicated in the noise assessment (Appendix G) in Figures 3, 4 and 5, the 65 dB CNEL noise contour would not extend to any sensitive residential areas. Additionally, because implementation of the Project would not change the number of overall flight operations from existing conditions, there is no substantial change in overall noise levels due to helicopter operations. This would be a less than significant impact.

Traffic Noise Levels

Based on the Table 4.12-6 criteria, an increase in the traffic noise level of 1.5 dB or more would be significant where the ambient noise level exceeds 65 dB L_{dn}. The rationale for the Table 4.12-6 criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause significant annoyance.

Table 4.12-6
Significance of Changes in Cumulative Noise Exposure

Ambient Noise Level Without Project, L_{dn} / CNEL	Increase Required for Significant Impact
<60 dBA	+5.0 dB or more
60–65 dBA	+3.0 dB or more
>65 dBA	+1.5 dB or more

Source: Brennan 2014, Table 4

The Project would not contribute to a substantial increase in traffic noise levels on the adjacent roadways. State Route (SR) 99 at the Project site carries approximately 6,600 vehicles per day (Caltrans 2012, p. 131). According to the noise assessment, the Project would have to contribute more than 3,000 vehicles per day to cause an increase of 1.5 dB in traffic noise from SR 99. On a daily basis, construction could generate 20 to 40 vehicle trips per day, with most of that activity concentrated in the beginning and ending of the work day. Traffic to and from the site would also occur on a regular basis when the Project is in operation, and the amount of traffic would vary seasonally. During the non-peak fire season, the typical daily facility crew is four persons. This total increases to 10 persons during the peak fire season, and during a maximum fire event, staffing could include 20 overnight personnel and 40 daytime personnel.

Based on this information, the Project's contribution to traffic on SR 99 would be substantially less than 3,000 vehicles per day and therefore the Project would not result in a noise level increase

beyond the 1.5 dB significance standard as shown in Table 4.12-6. Therefore, the Proposed Project is not predicted to substantially increase traffic noise levels. Therefore, a less than significant impact would occur.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
b)	Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐

Construction Vibration Levels

Table 4.12-7 shows the typical vibration levels produced by various pieces of construction equipment.

Table 4.12-7
Typical Construction Equipment Vibration Levels

Type of Equipment	Peak Particle Velocity at 25 Feet (inches/second)	Peak Particle Velocity at 50 Feet (inches/second)	Peak Particle Velocity at 100 Feet (inches/second)
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/Drill Rig	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/Roller	0.210	0.074	0.026

Source: Brennan 2014, Table 5

The Table 4.12-7 data indicates that construction vibration levels anticipated for the Project are less than the 0.1 in/sec criteria at distances of 50 feet. The nearest residential use is located approximately 2,400 feet from the Project site. Therefore, construction vibrations are not predicted to cause damage to existing buildings or cause annoyance to sensitive receptors. Implementation of the Proposed Project would have a less than significant impact.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
c)	Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐

As discussed in Issue a), implementation of the Proposed Project would not result in a substantial permanent increase in ambient noise levels that would exceed applicable noise standards. As a result, this impact is considered less than significant

d) Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☒	☐

As discussed in Issue a), implementation of the Proposed Project would not result in a substantial temporary or periodic increase in ambient noise levels that would exceed applicable noise standards. As a result, this impact is considered less than significant

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

The nearest public airport is the Corning Municipal Airport, located approximately 7.5 miles northwest of the Project site. The Project site is not within 2 miles of a public airport or within an airport land use plan. There would be no impact in this area.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☒	☐

The closest airport to the Project site is the privately owned Deer Creek Ranch Airport, which is located approximately 2.25 miles to the east. According to AirNav (2014), this airport is for private use only and includes one airport-based, single-engine aircraft. The airport sees little use. Because of the distance and the amount of use the airport receives, the Project would not be exposed to excess noise levels. As such, this would be a less than significant impact.

4.13 Population and Housing

4.13.1 Environmental Setting

The nearest residential community to the Project site is the community of Vina, located approximately 1.3 miles from the Project site. According to the 2010 US Census, this community had a population of 237 and 70 housing units.

During the peak fire season period, the typical daily facility crew at the Vina Helitack Base is ten persons: one pilot, two fire captains, one fire apparatus engineer, and six firefighters. During the non-peak fire season, daily staffing totals four personnel, generally consisting of a fire captain, two

firefighters, and one pilot. During a maximum fire event, staffing could include up to 20 overnight personnel (including existing base personnel), 40 daytime personnel including up to five general staff personnel, five engine strike team personnel, two water-tender operators, one bulldozer operator, and seven Type II helicopter pilots. The existing barracks has 12 beds. On completion of the Proposed Project, the barracks would have room for 22 beds.

4.13.2 Population and Housing (XIII.) Environmental Checklist and Discussion

a) Would the project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

The Proposed Project would not increase the number of homes or provide additional off-site infrastructure in the area. The Project would have no impact in this area.

b) Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

The Project would not remove substantial numbers of existing housing, as only a 12-bed barracks currently exist on the Project site. While the existing barracks would be demolished, it would be replaced with a barracks with greater capacity with completion of the Project. The Project would have no impact in this area.

c) Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

The Project would not displace a substantial number of people. All persons currently housed on the Project site would be accommodated at an alternative site during construction of the Project. The Project would have no impact in this area.

4.14 Public Services

4.14.1 Environmental Setting

Police Services

The Project site is served by the Tehama County Sheriff's Office and the California Highway Patrol. The Sheriff's Office responded to 23,991 calls in 2012 and 25,380 in 2010 (Tehama County 2012a).

There were 530 reported crimes in the county in 2012 including three murders, five rapes, and seven robberies. In 2010, 458 crimes were reported in the county, including one murder, three rapes, and 11 robberies (Tehama County 2012a, p. 4). The Sheriff's Office is located at 22840 Antelope Boulevard in Red Bluff, approximately 20 miles from the Project site. The patrol division of the Tehama County Sheriff's Office currently comprises four sergeants and 16 patrol deputies (Tehama County 2014b).

Level of service would be measured by the ratio of sheriff's deputies to residents. The Tehama County Sheriff's Office attempts to maintain a minimum of one officer per 1,000 residents in the unincorporated areas of the county (Tehama County 2008, p. 4.12-7).

The California Highway Patrol (CHP) provides traffic regulation enforcement, emergency management, and assistance on state roadways and other major roadways in unincorporated portions of Tehama County. The only CHP office in Tehama County is located at 2550 Main Street in Red Bluff.

Fire Services

Local fire service districts and city fire departments have primary responsibility for all fire protection on local responsibility areas (LRA) and structure protection in state responsibility areas (SRA) within their district boundaries. Twelve local fire departments are located throughout Tehama County, including Corning, Bend, Gerber, Los Molinos, Manton, Mineral, Paskenta, Paynes Creek, Richfield, Red Bluff, Cottonwood, and Vina. All local fire service agencies in the county are volunteer fire departments, with the exception of the Red Bluff Fire Department (Tehama County 2008, p. 4.12-1).

The California Department of Forestry and Fire Protection (CAL FIRE) has primary responsibility for wildland fire suppression and providing mutual aid to local fire agencies during the declared fire season (typically May 1 to December 1) in all state responsibility areas. This includes SRA lands within local fire service agency boundaries. Lands in local fire agency boundaries outside SRAs are called local responsibility areas (LRA) (Tehama County 2008, p. 4.12-2).

Schools

The public school system in Tehama County comprises services provided by public elementary and high school districts and the Tehama County Department of Education. Tehama County public schools include 19 elementary schools, four K–8 schools, three middle schools, and three high schools. In addition, there are also two charter schools in operation (Tehama County 2014a).

Parks

The Tehama County Parks and Recreation Department (TCPRD) has the primary responsibility for providing and maintaining recreation facilities and services in the unincorporated area of Tehama County. The TCPRD owns and maintains nine parks and two public access areas, all of which are maintained by County Parks and Recreation staff. Additionally, within the county are Mendocino National Forest, Lassen National Forest, and Lassen Volcanic National Park as well as lands owned by the Bureau of Land Management, all of which are used for recreational purposes. In addition, local parks are located in the cities of Red Bluff, Corning, and Tehama.

Other Public Facilities

The Tehama County Library system has three branches to serve the residents of the county with locations in Red Bluff, Los Molinos, and Corning. The Tehama County library system has developed collections, resources, and services that reflect the cultural, informational, recreational, and educational diversity of the residents. In addition, the Tehama County Library system is affiliated with the North State Cooperative Library System, which serves 13 Northern California counties. The system facilitates an extensive inter-library loan program between independent city and county libraries in cooperation with academic library affiliates to provide services to the north state (Tehama County 2008, p. 4.12-11).

4.14.2 (XIV.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: • Fire protection? • Police protection? • Schools? • Parks? • Other public facilities?	☐	☐	☐	☒

Fire Protection

The Proposed Project is the redevelopment of an existing fire facility. Implementation of the Project would not increase the demand for fire protection facilities and in fact would increase the ability of CAL FIRE to provide firefighting services in the county as well as in Northern California as a whole. As such, the Project would have no impact in this area.

Police Protection

Generally, police service standards are based on a ratio of police officers to population. In Tehama County, this ratio is one officer for every 1,000 persons as established by Tehama County General Plan Policy SAF-2.1c. Implementation of the Proposed Project would increase the number of fire personnel stationed at the facility, as the new barracks building would have 22 beds instead of the current 12 beds. However, the addition of a potential 10 more firefighters stationed at the helitack base would not increase the need for additional police officers or police facilities. As such, the Project would have no impact in this area.

Schools

The Proposed Project would be occupied by persons who are beyond the primary education level (i.e., kindergarten through twelfth grade). As such, development of the Project would not increase

the need for additional school facilities to serve Project residents. For those persons living on base wishing to attend a higher education facility, the nearest facilities are Shasta College (located in Redding) and California State University, Chico (located in Chico) offering education programs including distance-learning options to residents of Tehama County. The addition of a potential 10 more firefighters living at the base would not increase the need for new or expanded higher education facilities. As such, the Project would have no impact in this area.

Parks

The actual increase in permanent residents over existing conditions would be as much as 10 fire personnel as a result of the construction of a new 22-bed barracks. Currently, Tehama County does not have an established parkland to population ratio. The Quimby Act (California Government Code Section 66477) allows local recreation and park districts to ask for a dedication of parkland up to 5 acres per 1,000 of projected population. Based on this ratio and the potential number of new fire personnel, the Project would require 0.05 acres (2,178 square feet) of parkland. However, because the County does not have an adopted parkland ratio, the addition of a potential 10 fire personnel stationed at the base would not increase the need for additional parkland, as this addition does not surpass a level of service standard. As such, the Project would have no impact in this area.

Other Public Facilities

The addition of a potential of 10 permanent fire personnel stationed at the base would not increase the need for additional library facilities or other government facilities. As such, the Project would have no impact in this area.

4.15 Recreation

4.15.1 Environmental Setting

The Tehama County Parks and Recreation Department (TCPRD) has the primary responsibility for providing and maintaining recreation facilities and services in the unincorporated area of Tehama County. The TCPRD owns and maintains nine parks and two public access areas, all of which are maintained by County Parks and Recreation staff. Additionally, within the county are Mendocino National Forest, Lassen National Forest, and Lassen Volcanic National Park as well as lands owned by the Bureau of Land Management, all of which are used for recreational purposes. In addition, local parks are located in the cities of Red Bluff, Corning, and Tehama.

4.15.2 Recreation (XV.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒

The addition of a potential 10 new fire personnel permanently stationed at the Project site would not result in the use of area parks or other recreational facilities to the point where this use would result in substantial physical deterioration of any facility. As such, the Project would have no impact in this area.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

The Project does not include recreational facilities or require the construction or expansion of recreational facilities that would impact the environment. As such, the Project would have no impact in this area.

4.16 Transportation/Traffic

4.16.1 Environmental Setting

A traffic assessment was prepared for the Proposed Project by KD Anderson & Associates, Inc. (2014; Appendix H). The purpose of the assessment was to collect information on potential traffic impacts that could occur with the implementation of the Proposed Project. The following information was excerpted from that assessment.

Existing Roadway Network

The Project would be constructed on the Vina CAL FIRE site adjoining State Route (SR) 99, and both regional and direct access to the site is provided by SR 99. SR 99 links the facility with Red Bluff to the north and with the Chico area to the south. South Avenue intersects SR 99 roughly 0.4 mile north of site and connects the facility with Interstate 5.

Caltrans provides Annual Average Daily Traffic (AADT) counts for SR 99, and the most recent daily traffic volumes on SR 99 are 11,200 AADT at the Butte County line and 10,805 AADT south of South Avenue. Caltrans data indicates that trucks comprise 8 percent to 9 percent of the daily traffic on SR 99 in the study area.

The Caltrans State Route 99 Transportation Concept Report (SR 99 TCR) is a general guide to the long-range plan for improving the state highway. The report identifies three alternative visions for long-term improvements to SR 99 north of the Butte County line:

1. Improvements on the existing alignment
2. South Avenue alignment
3. New alignment to Interstate 5

Each vision would yield a four-lane facility.

South Avenue is an east–west route that links SR 99 north of the Project site with Interstate 5 in Corning. South Avenue is a two-lane facility classified as an arterial in the Tehama County General Plan. The General Plan Update EIR indicates that South Avenue carried 6,472 vehicles per day (KD Anderson 2014).

Traffic Impact Analysis Methodology

Qualitative level of service (LOS) analysis was performed for the study area circulation system access based on published information originally derived from the methodologies contained in the Highway Capacity Manual (HCM). LOS analysis is used to identify the relative delay experienced by motorists traveling on two-lane rural highways. A grading scale of LOS A to LOS F is used to describe the quality of traffic flow, with LOS A representing uncongested operations and LOS F representing stop-and-go operation with appreciable congestion and delay.

Existing Traffic Operations

Information regarding current traffic operations was obtained from available documents. The SR 99 TCR indicates that the state highway operates at LOS C in both directions in the vicinity of the Project site. The Tehama County General Plan Update EIR indicates that South Avenue operates at LOS B.

Regulatory Background

California Department of Transportation (Caltrans)

Caltrans has jurisdiction over SR 99 and the balance of the state highway system. According to the Caltrans (2002) Guide for the Preparation of Traffic Impact Studies, Caltrans aims to maintain a target level of service at the transition between C and D on state highway facilities. However, Caltrans acknowledges that this would not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing state highway facility is operating below the appropriate target LOS, the existing level of service should be maintained.

The SR 99 TCR identifies long-range improvements and establishes the concept (desired) LOS for specific corridor segments. The report identifies long-range improvements needed to bring an existing facility up to expected standards necessary to adequately serve 20-year traffic forecasts. Additionally, it identifies the ultimate design concept for conditions beyond the immediate 20-year design period. The SR 99 TCR establishes LOS C as the acceptable planning threshold for SR 99 in Tehama County from the Butte County line to South Avenue.

The Caltrans Highway Design Manual (HDM) provides guidance on the design of facilities on state highways. In this case, Chapter 4 identifies design requirements for intersections and turn lanes based on deceleration requirements and acceptable transitions from mainline highway alignment. Satisfaction of HDM requirements would be criteria in evaluating the adequacy of proposed improvements.

Tehama County

The Circulation Element of the Tehama County General Plan provides policy direction for the transportation systems that serve the unincorporated lands of the county and describes how the County intends to serve transportation needs for the next 20 years.

According to Policy Cir-1.1, Level of Service D is the minimum standard during peak hours and LOS C is the minimum standard during non-peak hours.

Tehama County Transportation Commission

The Tehama County 2006 Regional Transportation Plan (RTP) provides a coordinated, 20-year vision of the regionally significant transportation improvements and policies needed to efficiently move goods and people in the region. As the Regional Transportation Planning Agency, the Tehama County Transportation Commission is required by California law to adopt and submit an approved RTP to the California Transportation Commission every five years. Caltrans assists with plan preparation and reviews draft documents for compliance and consistency. The 2006 RTP does not include specific policy regarding minimum level of service.

4.16.2 Transportation/Traffic (XVI.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways, and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐

According to the traffic assessment completed for the Project, construction traffic would represent a small incremental addition to the current traffic volumes on SR 99 and South Avenue, and current levels of service would not be altered (KD Anderson 2014, p. 4). Because conditions with the Project would continue to satisfy the adopted minimum standards, the Project's impact would not be significant. Vehicular traffic accompanying the construction or operation of the Project would not result in a significant traffic impact.

Short-term traffic controls would be needed on SR 99 as the Project's improvements to the state highway are constructed. Traffic controls would include traffic detours or lane closures, which would delay motorists for short periods of time. Construction traffic controls would be included in a traffic handling plan as part of the documents included in the encroachment permit granted by Caltrans for work in the state right-of-way. Because construction traffic controls would be temporary and managed under a plan approved by Caltrans, these short-term delays are not judged to be a significant impact.

The Project would not impact, to a significant degree, operations of SR 99 or South Avenue. As such, the Project would not conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system.

b) Would the project conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☒	☐

The extent to which the Proposed Project would contribute to cumulative traffic impacts has been considered based on information contained in other documents. The reference materials cited earlier were reviewed to identify information relative to long-term conditions on SR 99 and South Avenue.

According to the traffic assessment, various sources suggest future traffic volumes on SR 99. The Tehama County General Plan Update EIR suggests that the current AADT would increase to 15,477 vehicles per day by 2028. This volume is indicative of LOS F conditions. The 2006 RTP suggests that passing lanes would be a “shorter-term” improvement needed in the area from South Avenue to the Butte County line to accommodate future demands. The same document suggests that the route ultimately be widened to a four-lane expressway, which is consistent with the SR 99 TCR (KD Anderson 2014, p. 4).

Available documents indicate that any project to widen SR 99 to four lanes would occur in the distant future (i.e., up to 50 years in the future). This work is neither funded nor programmed. Because the schedule for implementation is uncertain, Caltrans long-range planning staff has indicated that accommodating future expressway widening as part of the Proposed Project is not warranted and that the proposed improvements adequately address the Project’s cumulative impacts (KD Anderson 2014, p. 4).

Information regarding future traffic volumes on South Avenue is less prevalent. The 2006 Tehama County General Plan EIR was accompanied by the Tehama County Daily Traffic Model Report, Omni-Means, 9/2006. This document was the source of the SR 99 forecast cited above. The report figures suggested that the traffic volume on South Avenue would ultimately increase from the current 6,472 vehicles per day to more than 34,000 AADT.

The addition of Project-related vehicular traffic to SR 99 and South Avenue would not conflict with an applicable congestion management program. As such, the Project would have a less than significant impact in this area.

c) Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☐	☒

The Project site is not located near a public airport. The existing site is an operating CAL FIRE helitack base. Implementation of the Proposed Project would not increase the number of projected flights or uses on the site that would result in a change in the local air traffic patterns or an increase in local air traffic levels. As such, the Project would have no impact in this area.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
d)	Would the project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒

Implementation of the Project does not include any roadway improvements that would result in a traffic hazard. In fact, the addition of left and right turn lanes as well as acceleration lanes would increase roadway safety adjacent to the site. As such, the Project would have no impact in this area.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
e)	Would the project result in inadequate emergency access?	☐	☐	☐	☒

The Project site is an existing helitack base. This base is considered to currently have adequate emergency access. Implementation of the Project would not change the existing emergency access. As such, the Project would have no impact in this area.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
f)	Would the project conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities or otherwise decrease the performance or safety of such facilities?	☐	☐	☒	☐

No public transit, bicycle, or pedestrian facilities would be affected by Project development. The roadways and area adjacent to the Project site do not include facilities dedicated to pedestrian or bicycle use, however, bicycles are allowed on SR 99. Construction of the turn lane(s) would temporarily affect bicycle traffic. Existing public transportation routes would not be affected by the Proposed Project, as the transit routes would not change as a result of Project development. No existing transit stops are located adjacent to the Project site nor would the demand for a stop at this location increase because of the Project. As such, the Project would have a less than significant impact in this area.

4.17 Utilities and Service Systems

4.17.1 Environmental Setting

Water Service

No public water system is available to the Project site. Water at the site is provided by a well and storage tank. As part of the Proposed Project, a new ±500-foot-deep domestic water supply well, a new water filtration system, and domestic and fire water distribution systems would be developed. In addition, two new aboveground water storage tanks (10,000 gallons for domestic water use and

20,000 gallons for fire suppression) and concrete support slabs are included as part of the water supply system.

Wastewater

No public sewer/wastewater system is available to the Project site. Currently, the site uses a septic system to manage the base's wastewater. As a part of the Proposed Project, demolition of the existing septic system and installation of a new standard septic system or other appropriate system would occur. A new wastewater system would be needed due to earth removal/grading and placement of the new three-bay apparatus building on top of the existing leach field. The proposed septic system would consist of an approximately 600-foot leach field, a 1,500-gallon septic tank (minimum), and a 600-foot 6-inch gravity main. The new wastewater system would be connected to all necessary facilities.

Solid Waste

Solid waste is collected by GreenWaste of Tehama in Tehama County, including waste from the Project site. The nearest landfill to the site is the Tehama County/Red Bluff Landfill, which is a landfill and a materials recovery facility, located at 19995 Plymire Road in Red Bluff. The maximum permitted capacity at the landfill is 5,097,000 cubic yards, and the remaining capacity was 2,148,557 cubic yards as of December 31, 2008. The cease operation date is January 1, 2040 (CalRecycle 2014). There are also a number of transfer stations within the county and two hazardous household waste facilities.

4.17.2 Utilities and Service Systems (XVII.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☒	☐

The Proposed Project would not exceed wastewater treatment requirements. All wastewater would be directed into the new on-site wastewater system. The proposed standard septic system would consist of an approximately 600-foot leach field, a 1,500-gallon septic tank (minimum), and a 600-foot, 6-inch gravity main. All new proposed wastewater systems in Tehama County are required to be permitted and approved by the County Environmental Health Department. The permitting process requires percolation testing in order to ensure that the soil is capable of absorbing the waste. Septic systems in soils that are incapable of adequate waste absorption are not allowed. The Proposed Project would be required to comply with the Tehama County septic facility permitting process.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
b)	Would the project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

The Proposed Project would not connect to a public water or wastewater system. All water and wastewater components would be constructed on-site and would not affect any local public resources. Development of the Project would not require the construction of new public water or wastewater facilities. Therefore, the Project would have no impact in this area.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
c)	Would the project require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

All new stormwater drainage facilities would be constructed on-site. Implementation of the Project would not require the expansion or construction of any off-site stormwater facilities. The Project would have no impact in this area.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
d)	Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒

The Proposed Project would use groundwater as its only source of water. Unlike surface water, groundwater does not have existing entitlements. As such, the Project would have no impact in this area.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
e)	Would the project result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒

The Project would not use a wastewater treatment provider. All wastewater produced by the Project would be treated on-site using a septic system or other appropriate system. As such, the Project would have no impact in this area.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
f)	Would the project be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐

The Proposed Project is not anticipated to increase the amount of helitack base usage over existing conditions. The redevelopment of the site is intended to upgrade and bring the site to modern CAL FIRE standards. However, because the Project would include a larger barracks, the potential for additional fire personnel utilizing on base facilities compared to existing conditions does exist. This larger barracks would provide 22 beds instead of the existing 12 beds and as such an additional 10 persons could be housed on the site. The current per capita disposal in Tehama County is 4.4 pounds per day (CalRecycle 2014). At this rate, the addition of 10 new persons would add approximately 44 pounds of solid waste per day to Tehama County's waste stream. The Tehama County/Red Bluff Landfill maximum permitted throughput is 1.2 million pounds per day (CalRecycle 2014). The addition of 44 pounds per day would not exceed the daily throughput capacity at the landfill. Therefore, the Project would have a less than significant impact in this area.

A temporary increase in waste would occur during construction-related activities and is not expected to affect the permitted capacity of the Tehama County/Red Bluff Landfill. The new facility is replacing an existing facility, and solid waste produced from operations and maintenance would be equivalent to the amount currently produced at the existing facility.

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
g)	Would the project comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

The Project would be required to comply with all federal state and local regulations regarding solid waste. The Project would have a less than significant impact in this area.

4.18 Mandatory Findings of Significance

4.18.1 Mandatory Findings of Significance (XVIII.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐

None of the potential impacts identified for the Proposed Project have the potential to degrade habitat. Mitigation measures B-1 through B-8 would reduce impacts to protected or listed animal or plant species to a less than significant level. Mitigation measures C-1 and C-2 would eliminate impacts to California history or prehistory. Additionally, with the implementation of mitigation

measures proposed in the relevant sections of this Initial Study, all potential project impacts would be reduced to a level that is considered less than significant.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☒	☐

The Proposed Project would result in potentially significant cumulative impacts to air quality from short-term construction emissions. However, implementation of mitigation measure AQ-1 would ensure that short-term construction emissions are minimized. Therefore, the Proposed Project's contribution to the degradation of air quality would not be considered cumulatively considerable, and this would be considered a less than significant impact.

c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
	☐	☐	☒	☐

The Proposed Project would result in potentially significant impacts to air quality and hazardous materials, which could adversely affect human beings. However, implementation of mitigation measures AQ-1 and HM-1 would reduce all potential air quality and hazardous materials impacts to a less than significant level. The Proposed Project, as conditioned, would not cause substantial adverse effects on human beings, and this would be considered a less than significant impact.

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Appendix A – Air Quality/Climate Change Data Sheets

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APPENDIX A

Air Quality/Climate Change Data Sheets

Vina Helitack Base Replacement - Demolition & Site Preparation

Tehama County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Medical Office Building	0.00	1000sqft	7.40	322,344.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	68
Climate Zone	3			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Site acreage = 7.4 acres

Grading - Site acreage = 7.4 acres

Demolition -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblGrading	AcresOfGrading	10.00	7.40
tblLandUse	LandUseSquareFeet	0.00	322,344.00
tblLandUse	LotAcreage	0.00	7.40
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	5.2609	56.8897	42.6318	0.0399	18.2662	3.0883	21.3544	9.9798	2.8412	12.8210	0.0000	4,127.1934	4,127.1934	1.2275	0.0000	4,152.9715
Total	**5.2609**	**56.8897**	**42.6318**	**0.0399**	**18.2662**	**3.0883**	**21.3544**	**9.9798**	**2.8412**	**12.8210**	**0.0000**	**4,127.1934**	**4,127.1934**	**1.2275**	**0.0000**	**4,152.9715**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	5.2561	56.8375	42.5927	0.0399	8.3297	3.0855	11.4152	4.5179	2.8386	7.3565	0.0000	4,123.4069	4,123.4069	1.2264	0.0000	4,149.1614
Total	**5.2561**	**56.8375**	**42.5927**	**0.0399**	**8.3297**	**3.0855**	**11.4152**	**4.5179**	**2.8386**	**7.3565**	**0.0000**	**4,123.4069**	**4,123.4069**	**1.2264**	**0.0000**	**4,149.1614**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.0918**	**0.0917**	**0.0918**	**0.0752**	**54.3981**	**0.0916**	**46.5443**	**54.7296**	**0.0919**	**42.6214**	**0.0000**	**0.0917**	**0.0917**	**0.0921**	**0.0000**	**0.0917**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2015	1/28/2015	5	20	
2	Site Preparation	Site Preparation	1/29/2015	2/11/2015	5	10	
3	Grading	Grading	2/12/2015	3/11/2015	5	20	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Excavators	3	8.00	162	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	1	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	38.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2015

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.4220	0.0000	0.4220	0.0639	0.0000	0.0639			0.0000			0.0000
Off-Road	4.5083	48.3629	36.0738	0.0399		2.4508	2.4508		2.2858	2.2858		4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**4.5083**	**48.3629**	**36.0738**	**0.0399**	**0.4220**	**2.4508**	**2.8728**	**0.0639**	**2.2858**	**2.3497**		**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0251	0.0000	0.0251	6.1700e-003	0.0000	6.1700e-003			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1666	0.0000	0.1666	0.0409	0.0000	0.0409			0.0000			0.0000
Total					**0.1917**	**0.0000**	**0.1917**	**0.0471**	**0.0000**	**0.0471**			**0.0000**			**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1899	0.0000	0.1899	0.0288	0.0000	0.0288			0.0000			0.0000
Off-Road	4.5041	48.3186	36.0407	0.0399		2.4486	2.4486		2.2837	2.2837	0.0000	4,123.4069	4,123.4069	1.1178		4,146.8806
Total	**4.5041**	**48.3186**	**36.0407**	**0.0399**	**0.1899**	**2.4486**	**2.6384**	**0.0288**	**2.2837**	**2.3124**	**0.0000**	**4,123.4069**	**4,123.4069**	**1.1178**		**4,146.8806**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.5024	0.0000	0.5024	0.1233	0.0000	0.1233			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1666	0.0000	0.1666	0.0409	0.0000	0.0409			0.0000			0.0000
Total					**0.6690**	**0.0000**	**0.6690**	**0.1642**	**0.0000**	**0.1642**			**0.0000**			**0.0000**

3.3 Site Preparation - 2015

Unmitigated Construction On-Site

Acres of Grading: 7.4

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412		4,111.7444	4,111.7444	1.2275		4,137.5225
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**18.0663**	**3.0883**	**21.1545**	**9.9307**	**2.8412**	**12.7719**		**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5225**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1999	0.0000	0.1999	0.0491	0.0000	0.0491			0.0000			0.0000
Total					**0.1999**	**0.0000**	**0.1999**	**0.0491**	**0.0000**	**0.0491**			**0.0000**			**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	5.2561	56.8375	42.5927	0.0391		3.0855	3.0855		2.8386	2.8386	0.0000	4,107.9721	4,107.9721	1.2264		4,133.7265
Total	**5.2561**	**56.8375**	**42.5927**	**0.0391**	**8.1298**	**3.0855**	**11.2153**	**4.4688**	**2.8386**	**7.3074**	**0.0000**	**4,107.9721**	**4,107.9721**	**1.2264**		**4,133.7265**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1999	0.0000	0.1999	0.0491	0.0000	0.0491			0.0000			0.0000
Total					**0.1999**	**0.0000**	**0.1999**	**0.0491**	**0.0000**	**0.0491**			**0.0000**			**0.0000**

3.4 Grading - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.4145	0.0000	6.4145	3.3526	0.0000	3.3526			0.0000			0.0000
Off-Road	3.8327	40.4161	26.6731	0.0298		2.3284	2.3284		2.1421	2.1421		3,129.0158	3,129.0158	0.9341		3,148.6328
Total	**3.8327**	**40.4161**	**26.6731**	**0.0298**	**6.4145**	**2.3284**	**8.7428**	**3.3526**	**2.1421**	**5.4947**		**3,129.0158**	**3,129.0158**	**0.9341**		**3,148.6328**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1666	0.0000	0.1666	0.0409	0.0000	0.0409			0.0000			0.0000
Total					**0.1666**	**0.0000**	**0.1666**	**0.0409**	**0.0000**	**0.0409**			**0.0000**			**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.8865	0.0000	2.8865	1.5087	0.0000	1.5087			0.0000			0.0000
Off-Road	3.8292	40.3790	26.6487	0.0298		2.3262	2.3262		2.1401	2.1401	0.0000	3,126.1451	3,126.1451	0.9333		3,145.7441
Total	**3.8292**	**40.3790**	**26.6487**	**0.0298**	**2.8865**	**2.3262**	**5.2127**	**1.5087**	**2.1401**	**3.6488**	**0.0000**	**3,126.1451**	**3,126.1451**	**0.9333**		**3,145.7441**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1666	0.0000	0.1666	0.0409	0.0000	0.0409			0.0000			0.0000
Total					**0.1666**	**0.0000**	**0.1666**	**0.0409**	**0.0000**	**0.0409**			**0.0000**			**0.0000**

Vina Helitack Base Replacement - Building Construction

Tehama County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Medical Office Building	17.34	1000sqft	0.40	17,340.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	68
Climate Zone	3			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Building construction includes barracks, apparatus building, pump generator/storage building, & hangar

Construction Phase - Building construction, paving, and painting assumed to occur simultaneously

Grading -

Off-road Equipment -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	5.00	100.00
tblConstructionPhase	NumDays	5.00	100.00
tblConstructionPhase	PhaseEndDate	10/26/2015	6/8/2015
tblConstructionPhase	PhaseEndDate	10/26/2015	6/8/2015
tblConstructionPhase	PhaseStartDate	6/9/2015	1/20/2015
tblConstructionPhase	PhaseStartDate	6/9/2015	1/20/2015
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	WorkerTripNumber	18.00	15.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	3.0696	28.4907	17.5586	0.0254	0.2574	1.9450	2.2024	0.0632	1.8107	1.8739	0.0000	2,566.6935	2,566.6935	0.6894	0.0000	2,581.1704
Total	**3.0696**	**28.4907**	**17.5586**	**0.0254**	**0.2574**	**1.9450**	**2.2024**	**0.0632**	**1.8107**	**1.8739**	**0.0000**	**2,566.6935**	**2,566.6935**	**0.6894**	**0.0000**	**2,581.1704**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	3.0668	28.4646	17.5425	0.0254	0.2574	1.9432	2.2007	0.0632	1.8091	1.8723	0.0000	2,564.3387	2,564.3387	0.6888	0.0000	2,578.8023
Total	**3.0668**	**28.4646**	**17.5425**	**0.0254**	**0.2574**	**1.9432**	**2.2007**	**0.0632**	**1.8091**	**1.8723**	**0.0000**	**2,564.3387**	**2,564.3387**	**0.6888**	**0.0000**	**2,578.8023**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.0919**	**0.0917**	**0.0918**	**0.0787**	**0.0000**	**0.0920**	**0.0808**	**0.0000**	**0.0917**	**0.0886**	**0.0000**	**0.0917**	**0.0917**	**0.0914**	**0.0000**	**0.0917**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Building Construction	Building Construction	1/20/2015	6/8/2015	5	100	
2	Paving	Paving	1/20/2015	6/8/2015	5	100	
3	Architectural Coating	Architectural Coating	1/20/2015	6/8/2015	5	100	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Paving	Pavers	1	7.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Building Construction	5	6.00	3.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Building Construction - 2015

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4538	14.3777	8.2983	0.0113		0.9995	0.9995		0.9195	0.9195		1,191.7021	1,191.7021	0.3558		1,199.1733
Total	**1.4538**	**14.3777**	**8.2983**	**0.0113**		**0.9995**	**0.9995**		**0.9195**	**0.9195**		**1,191.7021**	**1,191.7021**	**0.3558**		**1,199.1733**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0131	0.0000	0.0131	3.2100e-003	0.0000	3.2100e-003			0.0000			0.0000
Worker					0.0666	0.0000	0.0666	0.0164	0.0000	0.0164			0.0000			0.0000
Total					**0.0797**	**0.0000**	**0.0797**	**0.0196**	**0.0000**	**0.0196**			**0.0000**			**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4524	14.3645	8.2907	0.0113		0.9986	0.9986		0.9187	0.9187	0.0000	1,190.6088	1,190.6088	0.3555		1,198.0731
Total	**1.4524**	**14.3645**	**8.2907**	**0.0113**		**0.9986**	**0.9986**		**0.9187**	**0.9187**	**0.0000**	**1,190.6088**	**1,190.6088**	**0.3555**		**1,198.0731**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0131	0.0000	0.0131	3.2100e-003	0.0000	3.2100e-003			0.0000			0.0000
Worker					0.0666	0.0000	0.0666	0.0164	0.0000	0.0164			0.0000			0.0000
Total					**0.0797**	**0.0000**	**0.0797**	**0.0196**	**0.0000**	**0.0196**			**0.0000**			**0.0000**

3.3 Paving - 2015

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2092	11.5427	7.3586	0.0111		0.7247	0.7247		0.6703	0.6703		1,093.5433	1,093.5433	0.2970		1,099.7794
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2092**	**11.5427**	**7.3586**	**0.0111**		**0.7247**	**0.7247**		**0.6703**	**0.6703**		**1,093.5433**	**1,093.5433**	**0.2970**		**1,099.7794**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1666	0.0000	0.1666	0.0409	0.0000	0.0409			0.0000			0.0000
Total					**0.1666**	**0.0000**	**0.1666**	**0.0409**	**0.0000**	**0.0409**			**0.0000**			**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2081	11.5321	7.3518	0.0111		0.7240	0.7240		0.6697	0.6697	0.0000	1,092.5401	1,092.5401	0.2967		1,098.7705
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2081**	**11.5321**	**7.3518**	**0.0111**		**0.7240**	**0.7240**		**0.6697**	**0.6697**	**0.0000**	**1,092.5401**	**1,092.5401**	**0.2967**		**1,098.7705**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1666	0.0000	0.1666	0.0409	0.0000	0.0409			0.0000			0.0000
Total					**0.1666**	**0.0000**	**0.1666**	**0.0409**	**0.0000**	**0.0409**			**0.0000**			**0.0000**

3.4 Architectural Coating - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4066	2.5703	1.9018	2.9700e-003		0.2209	0.2209		0.2209	0.2209		281.4481	281.4481	0.0367		282.2177
Total	**0.4066**	**2.5703**	**1.9018**	**2.9700e-003**		**0.2209**	**0.2209**		**0.2209**	**0.2209**		**281.4481**	**281.4481**	**0.0367**		**282.2177**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.0111	0.0000	0.0111	2.7300e-003	0.0000	2.7300e-003			0.0000			0.0000
Total					**0.0111**	**0.0000**	**0.0111**	**2.7300e-003**	**0.0000**	**2.7300e-003**			**0.0000**			**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4062	2.5680	1.9000	2.9700e-003		0.2207	0.2207		0.2207	0.2207	0.0000	281.1898	281.1898	0.0366		281.9587
Total	**0.4062**	**2.5680**	**1.9000**	**2.9700e-003**		**0.2207**	**0.2207**		**0.2207**	**0.2207**	**0.0000**	**281.1898**	**281.1898**	**0.0366**		**281.9587**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.0111	0.0000	0.0111	2.7300e-003	0.0000	2.7300e-003			0.0000			0.0000
Total					**0.0111**	**0.0000**	**0.0111**	**2.7300e-003**	**0.0000**	**2.7300e-003**			**0.0000**			**0.0000**

Vina Helitack Base Replacement - Facilities Placement

Tehama County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Medical Office Building	2.63	1000sqft	0.06	2,625.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	68
Climate Zone	3			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase -

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	1.4538	14.3777	8.2983	0.0113	0.1999	0.9995	1.0106	0.0491	0.9195	0.9223	0.0000	1,191.7021	1,191.7021	0.3558	0.0000	1,199.1733
Total	**1.4538**	**14.3777**	**8.2983**	**0.0113**	**0.1999**	**0.9995**	**1.0106**	**0.0491**	**0.9195**	**0.9223**	**0.0000**	**1,191.7021**	**1,191.7021**	**0.3558**	**0.0000**	**1,199.1733**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	1.4524	14.3645	8.2907	0.0113	0.1999	0.9986	1.0097	0.0491	0.9187	0.9214	0.0000	1,190.6088	1,190.6088	0.3555	0.0000	1,198.0731
Total	**1.4524**	**14.3645**	**8.2907**	**0.0113**	**0.1999**	**0.9986**	**1.0097**	**0.0491**	**0.9187**	**0.9214**	**0.0000**	**1,190.6088**	**1,190.6088**	**0.3555**	**0.0000**	**1,198.0731**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.0915**	**0.0917**	**0.0917**	**0.0882**	**0.0000**	**0.0920**	**0.0910**	**0.0000**	**0.0914**	**0.0922**	**0.0000**	**0.0917**	**0.0917**	**0.0899**	**0.0000**	**0.0917**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Building Construction	Building Construction	1/20/2015	6/8/2015	5	100	
2	Paving	Paving	6/9/2015	6/15/2015	5	5	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Paving	Pavers	1	7.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Building Construction	5	1.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Building Construction - 2015

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4538	14.3777	8.2983	0.0113		0.9995	0.9995		0.9195	0.9195		1,191.7021	1,191.7021	0.3558		1,199.1733
Total	**1.4538**	**14.3777**	**8.2983**	**0.0113**		**0.9995**	**0.9995**		**0.9195**	**0.9195**		**1,191.7021**	**1,191.7021**	**0.3558**		**1,199.1733**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.0111	0.0000	0.0111	2.7300e-003	0.0000	2.7300e-003			0.0000			0.0000
Total					**0.0111**	**0.0000**	**0.0111**	**2.7300e-003**	**0.0000**	**2.7300e-003**			**0.0000**			**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4524	14.3645	8.2907	0.0113		0.9986	0.9986		0.9187	0.9187	0.0000	1,190.6088	1,190.6088	0.3555		1,198.0731
Total	**1.4524**	**14.3645**	**8.2907**	**0.0113**		**0.9986**	**0.9986**		**0.9187**	**0.9187**	**0.0000**	**1,190.6088**	**1,190.6088**	**0.3555**		**1,198.0731**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.0111	0.0000	0.0111	2.7300e-003	0.0000	2.7300e-003			0.0000			0.0000
Total					**0.0111**	**0.0000**	**0.0111**	**2.7300e-003**	**0.0000**	**2.7300e-003**			**0.0000**			**0.0000**

3.3 Paving - 2015

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2092	11.5427	7.3586	0.0111		0.7247	0.7247		0.6703	0.6703		1,093.5433	1,093.5433	0.2970		1,099.7794
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2092**	**11.5427**	**7.3586**	**0.0111**		**0.7247**	**0.7247**		**0.6703**	**0.6703**		**1,093.5433**	**1,093.5433**	**0.2970**		**1,099.7794**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1999	0.0000	0.1999	0.0491	0.0000	0.0491			0.0000			0.0000
Total					**0.1999**	**0.0000**	**0.1999**	**0.0491**	**0.0000**	**0.0491**			**0.0000**			**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2081	11.5321	7.3518	0.0111		0.7240	0.7240		0.6697	0.6697	0.0000	1,092.5401	1,092.5401	0.2967		1,098.7705
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2081**	**11.5321**	**7.3518**	**0.0111**		**0.7240**	**0.7240**		**0.6697**	**0.6697**	**0.0000**	**1,092.5401**	**1,092.5401**	**0.2967**		**1,098.7705**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1999	0.0000	0.1999	0.0491	0.0000	0.0491			0.0000			0.0000
Total					**0.1999**	**0.0000**	**0.1999**	**0.0491**	**0.0000**	**0.0491**			**0.0000**			**0.0000**

Vina Helitack Base Replacement - Helipad Construction

Tehama County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	3.20	1000sqft	0.07	3,200.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	68
Climate Zone	3			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Helipads = approximately 3,200 square feet

Construction Phase -

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	1.2092	11.5427	7.3586	0.0111	0.1999	0.7247	0.9246	0.0491	0.6703	0.7194	0.0000	1,093.5433	1,093.5433	0.2970	0.0000	1,099.7794
Total	**1.2092**	**11.5427**	**7.3586**	**0.0111**	**0.1999**	**0.7247**	**0.9246**	**0.0491**	**0.6703**	**0.7194**	**0.0000**	**1,093.5433**	**1,093.5433**	**0.2970**	**0.0000**	**1,099.7794**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	1.2081	11.5321	7.3518	0.0111	0.1999	0.7240	0.9239	0.0491	0.6697	0.7188	0.0000	1,092.5401	1,092.5401	0.2967	0.0000	1,098.7705
Total	**1.2081**	**11.5321**	**7.3518**	**0.0111**	**0.1999**	**0.7240**	**0.9239**	**0.0491**	**0.6697**	**0.7188**	**0.0000**	**1,092.5401**	**1,092.5401**	**0.2967**	**0.0000**	**1,098.7705**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.0918**	**0.0917**	**0.0919**	**0.0901**	**0.0000**	**0.0925**	**0.0714**	**0.0000**	**0.0910**	**0.0848**	**0.0000**	**0.0917**	**0.0917**	**0.0909**	**0.0000**	**0.0917**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Paving	Paving	6/9/2015	6/15/2015	5	5	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Paving - 2015

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2092	11.5427	7.3586	0.0111		0.7247	0.7247		0.6703	0.6703		1,093.5433	1,093.5433	0.2970		1,099.7794
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2092**	**11.5427**	**7.3586**	**0.0111**		**0.7247**	**0.7247**		**0.6703**	**0.6703**		**1,093.5433**	**1,093.5433**	**0.2970**		**1,099.7794**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1999	0.0000	0.1999	0.0491	0.0000	0.0491			0.0000			0.0000
Total					**0.1999**	**0.0000**	**0.1999**	**0.0491**	**0.0000**	**0.0491**			**0.0000**			**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2081	11.5321	7.3518	0.0111		0.7240	0.7240		0.6697	0.6697	0.0000	1,092.5401	1,092.5401	0.2967		1,098.7705
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2081**	**11.5321**	**7.3518**	**0.0111**		**0.7240**	**0.7240**		**0.6697**	**0.6697**	**0.0000**	**1,092.5401**	**1,092.5401**	**0.2967**		**1,098.7705**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1999	0.0000	0.1999	0.0491	0.0000	0.0491			0.0000			0.0000
Total					**0.1999**	**0.0000**	**0.1999**	**0.0491**	**0.0000**	**0.0491**			**0.0000**			**0.0000**

Vina Helitack Base Replacement - Asphalt Paving

Tehama County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	3.40	Acre	3.40	148,104.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	68
Climate Zone	3			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - On-site paved access/drive way = approximately 3.4 acres

Construction Phase -

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2016	2.2905	18.3417	12.5623	0.0186	0.2221	1.1065	1.3286	0.0545	1.0198	1.0743	0.0000	1,902.2212	1,902.2212	0.5588	0.0000	1,913.9557
Total	**2.2905**	**18.3417**	**12.5623**	**0.0186**	**0.2221**	**1.1065**	**1.3286**	**0.0545**	**1.0198**	**1.0743**	**0.0000**	**1,902.2212**	**1,902.2212**	**0.5588**	**0.0000**	**1,913.9557**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2016	2.2888	18.3249	12.5508	0.0186	0.2221	1.1055	1.3276	0.0545	1.0188	1.0733	0.0000	1,900.4760	1,900.4760	0.5583	0.0000	1,912.1998
Total	**2.2888**	**18.3249**	**12.5508**	**0.0186**	**0.2221**	**1.1055**	**1.3276**	**0.0545**	**1.0188**	**1.0733**	**0.0000**	**1,900.4760**	**1,900.4760**	**0.5583**	**0.0000**	**1,912.1998**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.0716**	**0.0918**	**0.0917**	**0.1073**	**0.0000**	**0.0913**	**0.0768**	**0.0000**	**0.0922**	**0.0866**	**0.0000**	**0.0917**	**0.0917**	**0.0913**	**0.0000**	**0.0917**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Paving	Paving	1/5/2016	1/28/2016	5	18	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	125	0.42
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Paving	Paving Equipment	2	6.00	130	0.36

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Paving	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Paving - 2016

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7956	18.3417	12.5623	0.0186		1.1065	1.1065		1.0198	1.0198		1,902.2212	1,902.2212	0.5588		1,913.9557
Paving	0.4949					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.2905**	**18.3417**	**12.5623**	**0.0186**		**1.1065**	**1.1065**		**1.0198**	**1.0198**		**1,902.2212**	**1,902.2212**	**0.5588**		**1,913.9557**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.2221	0.0000	0.2221	0.0545	0.0000	0.0545			0.0000			0.0000
Total					**0.2221**	**0.0000**	**0.2221**	**0.0545**	**0.0000**	**0.0545**			**0.0000**			**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7940	18.3249	12.5508	0.0186		1.1055	1.1055		1.0188	1.0188	0.0000	1,900.4760	1,900.4760	0.5583		1,912.1998
Paving	0.4949					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.2888**	**18.3249**	**12.5508**	**0.0186**		**1.1055**	**1.1055**		**1.0188**	**1.0188**	**0.0000**	**1,900.4760**	**1,900.4760**	**0.5583**		**1,912.1998**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.2221	0.0000	0.2221	0.0545	0.0000	0.0545			0.0000			0.0000
Total					**0.2221**	**0.0000**	**0.2221**	**0.0545**	**0.0000**	**0.0545**			**0.0000**			**0.0000**

Vina Helitack Base Replacement - Highway 99 Improvements

Tehama County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	44.78	1000sqft	1.03	44,780.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	68
Climate Zone	3			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	2.0666	21.9443	14.0902	0.0141	5.0031	1.1968	6.1999	2.5474	1.1011	3.6485	0.0000	1,479.8000	1,479.8000	0.4418	0.0000	1,489.0774
Total	**2.0666**	**21.9443**	**14.0902**	**0.0141**	**5.0031**	**1.1968**	**6.1999**	**2.5474**	**1.1011**	**3.6485**	**0.0000**	**1,479.8000**	**1,479.8000**	**0.4418**	**0.0000**	**1,489.0774**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	2.0647	21.9241	14.0773	0.0141	2.3003	1.1957	3.4960	1.1583	1.1000	2.2584	0.0000	1,478.4424	1,478.4424	0.4414	0.0000	1,487.7113
Total	**2.0647**	**21.9241**	**14.0773**	**0.0141**	**2.3003**	**1.1957**	**3.4960**	**1.1583**	**1.1000**	**2.2584**	**0.0000**	**1,478.4424**	**1,478.4424**	**0.4414**	**0.0000**	**1,487.7113**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.0915**	**0.0918**	**0.0918**	**0.1420**	**54.0233**	**0.0911**	**43.6125**	**54.5293**	**0.0917**	**38.1009**	**0.0000**	**0.0917**	**0.0917**	**0.0905**	**0.0000**	**0.0917**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/31/2015	2/5/2015	5	4	
2	Paving	Paving	2/6/2015	2/19/2015	5	10	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	174	0.41
Paving	Paving Equipment	1	8.00	130	0.36

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	3	8.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 2015

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.9143	0.0000	4.9143	2.5256	0.0000	2.5256			0.0000			0.0000
Off-Road	2.0666	21.9443	14.0902	0.0141		1.1968	1.1968		1.1011	1.1011		1,479.8000	1,479.8000	0.4418		1,489.0774
Total	**2.0666**	**21.9443**	**14.0902**	**0.0141**	**4.9143**	**1.1968**	**6.1110**	**2.5256**	**1.1011**	**3.6267**		**1,479.8000**	**1,479.8000**	**0.4418**		**1,489.0774**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.0889	0.0000	0.0889	0.0218	0.0000	0.0218			0.0000			0.0000
Total					**0.0889**	**0.0000**	**0.0889**	**0.0218**	**0.0000**	**0.0218**			**0.0000**			**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.2114	0.0000	2.2114	1.1365	0.0000	1.1365			0.0000			0.0000
Off-Road	2.0647	21.9241	14.0773	0.0141		1.1957	1.1957		1.1000	1.1000	0.0000	1,478.4424	1,478.4424	0.4414		1,487.7113
Total	**2.0647**	**21.9241**	**14.0773**	**0.0141**	**2.2114**	**1.1957**	**3.4071**	**1.1365**	**1.1000**	**2.2366**	**0.0000**	**1,478.4424**	**1,478.4424**	**0.4414**		**1,487.7113**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.0889	0.0000	0.0889	0.0218	0.0000	0.0218			0.0000			0.0000
Total					**0.0889**	**0.0000**	**0.0889**	**0.0218**	**0.0000**	**0.0218**			**0.0000**			**0.0000**

3.3 Paving - 2015

Unmitigated Construction On-Site

Acres of Grading: 1.5

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4041	14.5959	9.1695	0.0133		0.8919	0.8919		0.8215	0.8215		1,382.4703	1,382.4703	0.4054		1,390.9826
Paving	0.2699					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6740**	**14.5959**	**9.1695**	**0.0133**		**0.8919**	**0.8919**		**0.8215**	**0.8215**		**1,382.4703**	**1,382.4703**	**0.4054**		**1,390.9826**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1444	0.0000	0.1444	0.0354	0.0000	0.0354			0.0000			0.0000
Total					**0.1444**	**0.0000**	**0.1444**	**0.0354**	**0.0000**	**0.0354**			**0.0000**			**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4028	14.5826	9.1611	0.0133		0.8911	0.8911		0.8207	0.8207	0.0000	1,381.2019	1,381.2019	0.4050		1,389.7064
Paving	0.2699					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6727**	**14.5826**	**9.1611**	**0.0133**		**0.8911**	**0.8911**		**0.8207**	**0.8207**	**0.0000**	**1,381.2019**	**1,381.2019**	**0.4050**		**1,389.7064**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1444	0.0000	0.1444	0.0354	0.0000	0.0354			0.0000			0.0000
Total					**0.1444**	**0.0000**	**0.1444**	**0.0354**	**0.0000**	**0.0354**			**0.0000**			**0.0000**

Vina Helitack Base Replacement - Mobile Trips

Tehama County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Medical Office Building	1.00	1000sqft	0.02	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	68
Climate Zone	3			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Vehicle Trips - 10 trips

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	ST_TR	8.96	10.00
tblVehicleTrips	SU_TR	1.55	10.00
tblVehicleTrips	WD_TR	36.13	10.00

2.0 Operational Detail - Mobile

2.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated					0.0402	0.0000	0.0402	9.8700e-003	0.0000	9.8700e-003			0.0000			0.0000
Unmitigated					0.0402	0.0000	0.0402	9.8700e-003	0.0000	9.8700e-003			0.0000			0.0000

2.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Medical Office Building	10.00	10.00	10.00	22,144	22,144
Total	10.00	10.00	10.00	22,144	22,144

2.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Medical Office Building	14.70	6.60	6.60	29.60	51.40	19.00	60	30	10

2.4 Fleet Mix

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH

Vina Helitack Base Replacement - Demolition & Site Preparation

Tehama County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Medical Office Building	0.00	1000sqft	7.40	322,344.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	68
Climate Zone	3			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Construction Phase -

Grading - Site acreage = 7.4 acres

Demolition -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblGrading	AcresOfGrading	10.00	7.40
tblLandUse	LandUseSquareFeet	0.00	322,344.00
tblLandUse	LotAcreage	0.00	7.40
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.1097	1.1722	0.8406	8.9000e-004	0.1631	0.0632	0.2263	0.0849	0.0585	0.1434	0.0000	84.4778	84.4778	0.0242	0.0000	84.9858
Total	**0.1097**	**1.1722**	**0.8406**	**8.9000e-004**	**0.1631**	**0.0632**	**0.2263**	**0.0849**	**0.0585**	**0.1434**	**0.0000**	**84.4778**	**84.4778**	**0.0242**	**0.0000**	**84.9858**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.1096	1.1708	0.8396	8.9000e-004	0.0803	0.0632	0.1435	0.0399	0.0584	0.0983	0.0000	84.3773	84.3773	0.0242	0.0000	84.8847
Total	**0.1096**	**1.1708**	**0.8396**	**8.9000e-004**	**0.0803**	**0.0632**	**0.1435**	**0.0399**	**0.0584**	**0.0983**	**0.0000**	**84.3773**	**84.3773**	**0.0242**	**0.0000**	**84.8847**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.1185**	**0.1194**	**0.1190**	**0.0000**	**50.7359**	**0.1107**	**36.5930**	**52.9862**	**0.1026**	**31.4270**	**0.0000**	**0.1190**	**0.1190**	**0.1240**	**0.0000**	**0.1190**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2015	1/28/2015	5	20	
2	Site Preparation	Site Preparation	1/29/2015	2/11/2015	5	10	
3	Grading	Grading	2/12/2015	3/11/2015	5	20	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Excavators	3	8.00	162	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	1	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	38.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2015

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.2200e-003	0.0000	4.2200e-003	6.4000e-004	0.0000	6.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0451	0.4836	0.3607	4.0000e-004		0.0245	0.0245		0.0229	0.0229	0.0000	37.4413	37.4413	0.0102	0.0000	37.6544
Total	**0.0451**	**0.4836**	**0.3607**	**4.0000e-004**	**4.2200e-003**	**0.0245**	**0.0287**	**6.4000e-004**	**0.0229**	**0.0235**	**0.0000**	**37.4413**	**37.4413**	**0.0102**	**0.0000**	**37.6544**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					1.5900e-003	0.0000	1.5900e-003	3.9000e-004	0.0000	3.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**1.8300e-003**	**0.0000**	**1.8300e-003**	**4.5000e-004**	**0.0000**	**4.5000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.9000e-003	0.0000	1.9000e-003	2.9000e-004	0.0000	2.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0450	0.4831	0.3603	4.0000e-004		0.0245	0.0245		0.0228	0.0228	0.0000	37.3967	37.3967	0.0101	0.0000	37.6096
Total	**0.0450**	**0.4831**	**0.3603**	**4.0000e-004**	**1.9000e-003**	**0.0245**	**0.0264**	**2.9000e-004**	**0.0228**	**0.0231**	**0.0000**	**37.3967**	**37.3967**	**0.0101**	**0.0000**	**37.6096**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					4.7900e-003	0.0000	4.7900e-003	1.1800e-003	0.0000	1.1800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					1.5900e-003	0.0000	1.5900e-003	3.9000e-004	0.0000	3.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**6.3800e-003**	**0.0000**	**6.3800e-003**	**1.5700e-003**	**0.0000**	**1.5700e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Site Preparation - 2015

Unmitigated Construction On-Site

Acres of Grading: 7.4

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0263	0.2845	0.2132	2.0000e-004		0.0154	0.0154		0.0142	0.0142	0.0000	18.6506	18.6506	5.5700e-003	0.0000	18.7675
Total	**0.0263**	**0.2845**	**0.2132**	**2.0000e-004**	**0.0903**	**0.0154**	**0.1058**	**0.0497**	**0.0142**	**0.0639**	**0.0000**	**18.6506**	**18.6506**	**5.5700e-003**	**0.0000**	**18.7675**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					9.5000e-004	0.0000	9.5000e-004	2.3000e-004	0.0000	2.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**9.5000e-004**	**0.0000**	**9.5000e-004**	**2.3000e-004**	**0.0000**	**2.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0407	0.0000	0.0407	0.0223	0.0000	0.0223	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0263	0.2841	0.2129	2.0000e-004		0.0154	0.0154		0.0142	0.0142	0.0000	18.6284	18.6284	5.5600e-003	0.0000	18.7452
Total	**0.0263**	**0.2841**	**0.2129**	**2.0000e-004**	**0.0407**	**0.0154**	**0.0561**	**0.0223**	**0.0142**	**0.0365**	**0.0000**	**18.6284**	**18.6284**	**5.5600e-003**	**0.0000**	**18.7452**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					9.5000e-004	0.0000	9.5000e-004	2.3000e-004	0.0000	2.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**9.5000e-004**	**0.0000**	**9.5000e-004**	**2.3000e-004**	**0.0000**	**2.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.4 Grading - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0641	0.0000	0.0641	0.0335	0.0000	0.0335	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0383	0.4042	0.2667	3.0000e-004		0.0233	0.0233		0.0214	0.0214	0.0000	28.3860	28.3860	8.4700e-003	0.0000	28.5639
Total	**0.0383**	**0.4042**	**0.2667**	**3.0000e-004**	**0.0641**	**0.0233**	**0.0874**	**0.0335**	**0.0214**	**0.0550**	**0.0000**	**28.3860**	**28.3860**	**8.4700e-003**	**0.0000**	**28.5639**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					1.5900e-003	0.0000	1.5900e-003	3.9000e-004	0.0000	3.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**1.5900e-003**	**0.0000**	**1.5900e-003**	**3.9000e-004**	**0.0000**	**3.9000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0289	0.0000	0.0289	0.0151	0.0000	0.0151	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0383	0.4037	0.2664	3.0000e-004		0.0233	0.0233		0.0214	0.0214	0.0000	28.3522	28.3522	8.4600e-003	0.0000	28.5299
Total	**0.0383**	**0.4037**	**0.2664**	**3.0000e-004**	**0.0289**	**0.0233**	**0.0521**	**0.0151**	**0.0214**	**0.0365**	**0.0000**	**28.3522**	**28.3522**	**8.4600e-003**	**0.0000**	**28.5299**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					1.5900e-003	0.0000	1.5900e-003	3.9000e-004	0.0000	3.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**1.5900e-003**	**0.0000**	**1.5900e-003**	**3.9000e-004**	**0.0000**	**3.9000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Vina Helitack Base Replacement - Building Construction

Tehama County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Medical Office Building	17.34	1000sqft	0.40	17,340.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	68
Climate Zone	3			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Building construction includes barracks, apparatus building, pump generator/storage building, & hangar

Construction Phase - Building construction, paving, and painting assumed to occur simultaneously

Grading -

Off-road Equipment -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	5.00	100.00
tblConstructionPhase	NumDays	5.00	100.00
tblConstructionPhase	PhaseEndDate	10/26/2015	6/8/2015
tblConstructionPhase	PhaseEndDate	10/26/2015	6/8/2015
tblConstructionPhase	PhaseStartDate	6/9/2015	1/20/2015
tblConstructionPhase	PhaseStartDate	6/9/2015	1/20/2015
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	WorkerTripNumber	18.00	15.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.1535	1.4245	0.8779	1.2700e-003	0.0123	0.0973	0.1095	3.0100e-003	0.0905	0.0936	0.0000	116.4233	116.4233	0.0313	0.0000	117.0799
Total	**0.1535**	**1.4245**	**0.8779**	**1.2700e-003**	**0.0123**	**0.0973**	**0.1095**	**3.0100e-003**	**0.0905**	**0.0936**	**0.0000**	**116.4233**	**116.4233**	**0.0313**	**0.0000**	**117.0799**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.1533	1.4228	0.8769	1.2700e-003	0.0123	0.0971	0.1094	3.0100e-003	0.0904	0.0934	0.0000	116.2848	116.2848	0.0312	0.0000	116.9406
Total	**0.1533**	**1.4228**	**0.8769**	**1.2700e-003**	**0.0123**	**0.0971**	**0.1094**	**3.0100e-003**	**0.0904**	**0.0934**	**0.0000**	**116.2848**	**116.2848**	**0.0312**	**0.0000**	**116.9406**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.1173**	**0.1193**	**0.1196**	**0.0000**	**0.0000**	**0.1131**	**0.1004**	**0.0000**	**0.1215**	**0.1176**	**0.0000**	**0.1190**	**0.1190**	**0.1279**	**0.0000**	**0.1190**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Building Construction	Building Construction	1/20/2015	6/8/2015	5	100	
2	Paving	Paving	1/20/2015	6/8/2015	5	100	
3	Architectural Coating	Architectural Coating	1/20/2015	6/8/2015	5	100	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Paving	Pavers	1	7.00	125	0.42

Paving	Rollers	1	7.00	80	0.38
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Building Construction	5	6.00	3.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Building Construction - 2015

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0727	0.7189	0.4149	5.7000e-004		0.0500	0.0500		0.0460	0.0460	0.0000	54.0547	54.0547	0.0161	0.0000	54.3936
Total	**0.0727**	**0.7189**	**0.4149**	**5.7000e-004**		**0.0500**	**0.0500**		**0.0460**	**0.0460**	**0.0000**	**54.0547**	**54.0547**	**0.0161**	**0.0000**	**54.3936**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					6.2000e-004	0.0000	6.2000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					3.1800e-003	0.0000	3.1800e-003	7.8000e-004	0.0000	7.8000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**3.8000e-003**	**0.0000**	**3.8000e-003**	**9.3000e-004**	**0.0000**	**9.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0726	0.7180	0.4144	5.7000e-004		0.0499	0.0499		0.0459	0.0459	0.0000	53.9904	53.9904	0.0161	0.0000	54.3289
Total	**0.0726**	**0.7180**	**0.4144**	**5.7000e-004**		**0.0499**	**0.0499**		**0.0459**	**0.0459**	**0.0000**	**53.9904**	**53.9904**	**0.0161**	**0.0000**	**54.3289**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					6.2000e-004	0.0000	6.2000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					3.1800e-003	0.0000	3.1800e-003	7.8000e-004	0.0000	7.8000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**3.8000e-003**	**0.0000**	**3.8000e-003**	**9.3000e-004**	**0.0000**	**9.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Paving - 2015

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0605	0.5771	0.3679	5.6000e-004		0.0362	0.0362		0.0335	0.0335	0.0000	49.6023	49.6023	0.0135	0.0000	49.8852
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0605**	**0.5771**	**0.3679**	**5.6000e-004**		**0.0362**	**0.0362**		**0.0335**	**0.0335**	**0.0000**	**49.6023**	**49.6023**	**0.0135**	**0.0000**	**49.8852**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					7.9400e-003	0.0000	7.9400e-003	1.9500e-003	0.0000	1.9500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**7.9400e-003**	**0.0000**	**7.9400e-003**	**1.9500e-003**	**0.0000**	**1.9500e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0604	0.5765	0.3675	5.5000e-004		0.0362	0.0362		0.0335	0.0335	0.0000	49.5433	49.5433	0.0135	0.0000	49.8258
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0604**	**0.5765**	**0.3675**	**5.5000e-004**		**0.0362**	**0.0362**		**0.0335**	**0.0335**	**0.0000**	**49.5433**	**49.5433**	**0.0135**	**0.0000**	**49.8258**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					7.9400e-003	0.0000	7.9400e-003	1.9500e-003	0.0000	1.9500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**7.9400e-003**	**0.0000**	**7.9400e-003**	**1.9500e-003**	**0.0000**	**1.9500e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.4 Architectural Coating - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0203	0.1285	0.0951	1.5000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	12.7663	12.7663	1.6600e-003	0.0000	12.8012
Total	**0.0203**	**0.1285**	**0.0951**	**1.5000e-004**		**0.0110**	**0.0110**		**0.0110**	**0.0110**	**0.0000**	**12.7663**	**12.7663**	**1.6600e-003**	**0.0000**	**12.8012**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					5.3000e-004	0.0000	5.3000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**5.3000e-004**	**0.0000**	**5.3000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0203	0.1284	0.0950	1.5000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	12.7511	12.7511	1.6600e-003	0.0000	12.7860
Total	**0.0203**	**0.1284**	**0.0950**	**1.5000e-004**		**0.0110**	**0.0110**		**0.0110**	**0.0110**	**0.0000**	**12.7511**	**12.7511**	**1.6600e-003**	**0.0000**	**12.7860**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					5.3000e-004	0.0000	5.3000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**5.3000e-004**	**0.0000**	**5.3000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Vina Helitack Base Replacement - Facilities Placement

Tehama County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Medical Office Building	2.63	1000sqft	0.06	2,625.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	68
Climate Zone	3			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase -

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.0757	0.7477	0.4333	5.9000e-004	1.0100e-003	0.0518	0.0528	2.5000e-004	0.0477	0.0479	0.0000	56.5348	56.5348	0.0168	0.0000	56.8878
Total	**0.0757**	**0.7477**	**0.4333**	**5.9000e-004**	**1.0100e-003**	**0.0518**	**0.0528**	**2.5000e-004**	**0.0477**	**0.0479**	**0.0000**	**56.5348**	**56.5348**	**0.0168**	**0.0000**	**56.8878**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.0756	0.7469	0.4328	5.9000e-004	1.0100e-003	0.0517	0.0527	2.5000e-004	0.0476	0.0478	0.0000	56.4676	56.4676	0.0168	0.0000	56.8202
Total	**0.0756**	**0.7469**	**0.4328**	**5.9000e-004**	**1.0100e-003**	**0.0517**	**0.0527**	**2.5000e-004**	**0.0476**	**0.0478**	**0.0000**	**56.4676**	**56.4676**	**0.0168**	**0.0000**	**56.8202**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.1189**	**0.1190**	**0.1200**	**0.0000**	**0.0000**	**0.1352**	**0.1137**	**0.0000**	**0.1049**	**0.1253**	**0.0000**	**0.1190**	**0.1190**	**0.1190**	**0.0000**	**0.1190**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Building Construction	Building Construction	1/20/2015	6/8/2015	5	100	
2	Paving	Paving	6/9/2015	6/15/2015	5	5	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Paving	Pavers	1	7.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Building Construction	5	1.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Building Construction - 2015

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0727	0.7189	0.4149	5.7000e-004		0.0500	0.0500		0.0460	0.0460	0.0000	54.0547	54.0547	0.0161	0.0000	54.3936
Total	**0.0727**	**0.7189**	**0.4149**	**5.7000e-004**		**0.0500**	**0.0500**		**0.0460**	**0.0460**	**0.0000**	**54.0547**	**54.0547**	**0.0161**	**0.0000**	**54.3936**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					5.3000e-004	0.0000	5.3000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**5.3000e-004**	**0.0000**	**5.3000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0726	0.7180	0.4144	5.7000e-004		0.0499	0.0499		0.0459	0.0459	0.0000	53.9904	53.9904	0.0161	0.0000	54.3289
Total	**0.0726**	**0.7180**	**0.4144**	**5.7000e-004**		**0.0499**	**0.0499**		**0.0459**	**0.0459**	**0.0000**	**53.9904**	**53.9904**	**0.0161**	**0.0000**	**54.3289**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					5.3000e-004	0.0000	5.3000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**5.3000e-004**	**0.0000**	**5.3000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Paving - 2015

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.0200e-003	0.0289	0.0184	3.0000e-005		1.8100e-003	1.8100e-003		1.6800e-003	1.6800e-003	0.0000	2.4801	2.4801	6.7000e-004	0.0000	2.4943
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.0200e-003**	**0.0289**	**0.0184**	**3.0000e-005**		**1.8100e-003**	**1.8100e-003**		**1.6800e-003**	**1.6800e-003**	**0.0000**	**2.4801**	**2.4801**	**6.7000e-004**	**0.0000**	**2.4943**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					4.8000e-004	0.0000	4.8000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**4.8000e-004**	**0.0000**	**4.8000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.0200e-003	0.0288	0.0184	3.0000e-005		1.8100e-003	1.8100e-003		1.6700e-003	1.6700e-003	0.0000	2.4772	2.4772	6.7000e-004	0.0000	2.4913
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.0200e-003**	**0.0288**	**0.0184**	**3.0000e-005**		**1.8100e-003**	**1.8100e-003**		**1.6700e-003**	**1.6700e-003**	**0.0000**	**2.4772**	**2.4772**	**6.7000e-004**	**0.0000**	**2.4913**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					4.8000e-004	0.0000	4.8000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**4.8000e-004**	**0.0000**	**4.8000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Vina Helitack Base Replacement - Helipad Construction

Tehama County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	3.20	1000sqft	0.07	3,200.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	68
Climate Zone	3			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Helipads = approximately 3,200 square feet

Construction Phase -

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	3.0200e-003	0.0289	0.0184	3.0000e-005	4.8000e-004	1.8100e-003	2.2900e-003	1.2000e-004	1.6800e-003	1.7900e-003	0.0000	2.4801	2.4801	6.7000e-004	0.0000	2.4943
Total	**3.0200e-003**	**0.0289**	**0.0184**	**3.0000e-005**	**4.8000e-004**	**1.8100e-003**	**2.2900e-003**	**1.2000e-004**	**1.6800e-003**	**1.7900e-003**	**0.0000**	**2.4801**	**2.4801**	**6.7000e-004**	**0.0000**	**2.4943**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	3.0200e-003	0.0288	0.0184	3.0000e-005	4.8000e-004	1.8100e-003	2.2900e-003	1.2000e-004	1.6700e-003	1.7900e-003	0.0000	2.4772	2.4772	6.7000e-004	0.0000	2.4913
Total	**3.0200e-003**	**0.0288**	**0.0184**	**3.0000e-005**	**4.8000e-004**	**1.8100e-003**	**2.2900e-003**	**1.2000e-004**	**1.6700e-003**	**1.7900e-003**	**0.0000**	**2.4772**	**2.4772**	**6.7000e-004**	**0.0000**	**2.4913**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.0000**	**0.1386**	**0.1630**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.5952**	**0.0000**	**0.0000**	**0.1189**	**0.1189**	**0.0000**	**0.0000**	**0.1191**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Paving	Paving	6/9/2015	6/15/2015	5	5	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Paving - 2015

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.0200e-003	0.0289	0.0184	3.0000e-005		1.8100e-003	1.8100e-003		1.6800e-003	1.6800e-003	0.0000	2.4801	2.4801	6.7000e-004	0.0000	2.4943
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.0200e-003**	**0.0289**	**0.0184**	**3.0000e-005**		**1.8100e-003**	**1.8100e-003**		**1.6800e-003**	**1.6800e-003**	**0.0000**	**2.4801**	**2.4801**	**6.7000e-004**	**0.0000**	**2.4943**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					4.8000e-004	0.0000	4.8000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**4.8000e-004**	**0.0000**	**4.8000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.0200e-003	0.0288	0.0184	3.0000e-005		1.8100e-003	1.8100e-003		1.6700e-003	1.6700e-003	0.0000	2.4772	2.4772	6.7000e-004	0.0000	2.4913
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.0200e-003**	**0.0288**	**0.0184**	**3.0000e-005**		**1.8100e-003**	**1.8100e-003**		**1.6700e-003**	**1.6700e-003**	**0.0000**	**2.4772**	**2.4772**	**6.7000e-004**	**0.0000**	**2.4913**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					4.8000e-004	0.0000	4.8000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**4.8000e-004**	**0.0000**	**4.8000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Vina Helitack Base Replacement - Asphalt Paving

Tehama County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	3.40	Acre	3.40	148,104.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	68
Climate Zone	3			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - On-site paved access/drive way = approximately 3.4 acres

Construction Phase -

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.0206	0.1651	0.1131	1.7000e-004	1.9100e-003	9.9600e-003	0.0119	4.7000e-004	9.1800e-003	9.6500e-003	0.0000	15.5310	15.5310	4.5600e-003	0.0000	15.6268
Total	**0.0206**	**0.1651**	**0.1131**	**1.7000e-004**	**1.9100e-003**	**9.9600e-003**	**0.0119**	**4.7000e-004**	**9.1800e-003**	**9.6500e-003**	**0.0000**	**15.5310**	**15.5310**	**4.5600e-003**	**0.0000**	**15.6268**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.0206	0.1649	0.1129	1.7000e-004	1.9100e-003	9.9500e-003	0.0119	4.7000e-004	9.1700e-003	9.6300e-003	0.0000	15.5125	15.5125	4.5600e-003	0.0000	15.6082
Total	**0.0206**	**0.1649**	**0.1129**	**1.7000e-004**	**1.9100e-003**	**9.9500e-003**	**0.0119**	**4.7000e-004**	**9.1700e-003**	**9.6300e-003**	**0.0000**	**15.5125**	**15.5125**	**4.5600e-003**	**0.0000**	**15.6082**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.0485**	**0.1212**	**0.1150**	**0.0000**	**0.0000**	**0.1004**	**0.0843**	**0.0000**	**0.1089**	**0.2073**	**0.0000**	**0.1189**	**0.1189**	**0.0000**	**0.0000**	**0.1190**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Paving	Paving	1/5/2016	1/28/2016	5	18	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	125	0.42
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Paving	Paving Equipment	2	6.00	130	0.36

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Paving	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Paving - 2016

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0162	0.1651	0.1131	1.7000e-004		9.9600e-003	9.9600e-003		9.1800e-003	9.1800e-003	0.0000	15.5310	15.5310	4.5600e-003	0.0000	15.6268
Paving	4.4500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0206**	**0.1651**	**0.1131**	**1.7000e-004**		**9.9600e-003**	**9.9600e-003**		**9.1800e-003**	**9.1800e-003**	**0.0000**	**15.5310**	**15.5310**	**4.5600e-003**	**0.0000**	**15.6268**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					1.9100e-003	0.0000	1.9100e-003	4.7000e-004	0.0000	4.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**1.9100e-003**	**0.0000**	**1.9100e-003**	**4.7000e-004**	**0.0000**	**4.7000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0161	0.1649	0.1129	1.7000e-004		9.9500e-003	9.9500e-003		9.1700e-003	9.1700e-003	0.0000	15.5125	15.5125	4.5600e-003	0.0000	15.6082
Paving	4.4500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0206**	**0.1649**	**0.1129**	**1.7000e-004**		**9.9500e-003**	**9.9500e-003**		**9.1700e-003**	**9.1700e-003**	**0.0000**	**15.5125**	**15.5125**	**4.5600e-003**	**0.0000**	**15.6082**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					1.9100e-003	0.0000	1.9100e-003	4.7000e-004	0.0000	4.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**1.9100e-003**	**0.0000**	**1.9100e-003**	**4.7000e-004**	**0.0000**	**4.7000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Vina Helitack Base Replacement - Highway 99 Improvements

Tehama County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	44.78	1000sqft	1.03	44,780.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	68
Climate Zone	3			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.0125	0.1169	0.0740	9.0000e-005	0.0107	6.8500e-003	0.0175	5.2600e-003	6.3100e-003	0.0116	0.0000	8.9557	8.9557	2.6400e-003	0.0000	9.0111
Total	**0.0125**	**0.1169**	**0.0740**	**9.0000e-005**	**0.0107**	**6.8500e-003**	**0.0175**	**5.2600e-003**	**6.3100e-003**	**0.0116**	**0.0000**	**8.9557**	**8.9557**	**2.6400e-003**	**0.0000**	**9.0111**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.0125	0.1167	0.0739	9.0000e-005	5.2800e-003	6.8500e-003	0.0121	2.4800e-003	6.3000e-003	8.7900e-003	0.0000	8.9450	8.9450	2.6400e-003	0.0000	9.0004
Total	**0.0125**	**0.1167**	**0.0739**	**9.0000e-005**	**5.2800e-003**	**6.8500e-003**	**0.0121**	**2.4800e-003**	**6.3000e-003**	**8.7900e-003**	**0.0000**	**8.9450**	**8.9450**	**2.6400e-003**	**0.0000**	**9.0004**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.0800**	**0.1198**	**0.1216**	**0.0000**	**50.6080**	**0.0000**	**30.8438**	**52.8517**	**0.1585**	**24.0277**	**0.0000**	**0.1189**	**0.1189**	**0.0000**	**0.0000**	**0.1190**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/31/2015	2/5/2015	5	4	
2	Paving	Paving	2/6/2015	2/19/2015	5	10	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	174	0.41
Paving	Paving Equipment	1	8.00	130	0.36

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	3	8.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 2015

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.8300e-003	0.0000	9.8300e-003	5.0500e-003	0.0000	5.0500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.1300e-003	0.0439	0.0282	3.0000e-005		2.3900e-003	2.3900e-003		2.2000e-003	2.2000e-003	0.0000	2.6849	2.6849	8.0000e-004	0.0000	2.7017
Total	**4.1300e-003**	**0.0439**	**0.0282**	**3.0000e-005**	**9.8300e-003**	**2.3900e-003**	**0.0122**	**5.0500e-003**	**2.2000e-003**	**7.2500e-003**	**0.0000**	**2.6849**	**2.6849**	**8.0000e-004**	**0.0000**	**2.7017**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					1.7000e-004	0.0000	1.7000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**1.7000e-004**	**0.0000**	**1.7000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.4200e-003	0.0000	4.4200e-003	2.2700e-003	0.0000	2.2700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.1300e-003	0.0438	0.0282	3.0000e-005		2.3900e-003	2.3900e-003		2.2000e-003	2.2000e-003	0.0000	2.6817	2.6817	8.0000e-004	0.0000	2.6985
Total	**4.1300e-003**	**0.0438**	**0.0282**	**3.0000e-005**	**4.4200e-003**	**2.3900e-003**	**6.8100e-003**	**2.2700e-003**	**2.2000e-003**	**4.4700e-003**	**0.0000**	**2.6817**	**2.6817**	**8.0000e-004**	**0.0000**	**2.6985**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					1.7000e-004	0.0000	1.7000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**1.7000e-004**	**0.0000**	**1.7000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Paving - 2015

Unmitigated Construction On-Site

Acres of Grading: 1.5

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.0200e-003	0.0730	0.0459	7.0000e-005		4.4600e-003	4.4600e-003		4.1100e-003	4.1100e-003	0.0000	6.2708	6.2708	1.8400e-003	0.0000	6.3094
Paving	1.3500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.3700e-003**	**0.0730**	**0.0459**	**7.0000e-005**		**4.4600e-003**	**4.4600e-003**		**4.1100e-003**	**4.1100e-003**	**0.0000**	**6.2708**	**6.2708**	**1.8400e-003**	**0.0000**	**6.3094**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					6.9000e-004	0.0000	6.9000e-004	1.7000e-004	0.0000	1.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**6.9000e-004**	**0.0000**	**6.9000e-004**	**1.7000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.0100e-003	0.0729	0.0458	7.0000e-005		4.4500e-003	4.4500e-003		4.1000e-003	4.1000e-003	0.0000	6.2633	6.2633	1.8400e-003	0.0000	6.3019
Paving	1.3500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.3600e-003**	**0.0729**	**0.0458**	**7.0000e-005**		**4.4500e-003**	**4.4500e-003**		**4.1000e-003**	**4.1000e-003**	**0.0000**	**6.2633**	**6.2633**	**1.8400e-003**	**0.0000**	**6.3019**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					6.9000e-004	0.0000	6.9000e-004	1.7000e-004	0.0000	1.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**6.9000e-004**	**0.0000**	**6.9000e-004**	**1.7000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Vina Helitack Base Replacement - Mobile Trips

Tehama County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Medical Office Building	1.00	1000sqft	0.02	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	68
Climate Zone	3			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Vehicle Trips - 10 trips

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	ST_TR	8.96	10.00
tblVehicleTrips	SU_TR	1.55	10.00
tblVehicleTrips	WD_TR	36.13	10.00

2.0 Operational Detail - Mobile

2.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated					6.9800e-003	0.0000	6.9800e-003	1.7100e-003	0.0000	1.7100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated					6.9800e-003	0.0000	6.9800e-003	1.7100e-003	0.0000	1.7100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

2.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Medical Office Building	10.00	10.00	10.00	22,144	22,144
Total	10.00	10.00	10.00	22,144	22,144

2.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Medical Office Building	14.70	6.60	6.60	29.60	51.40	19.00	60	30	10

2.4 Fleet Mix

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH

Vina Helitack Base Replacement - Site Emissions

Tehama County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Medical Office Building	15.20	1000sqft	0.35	15,200.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	68
Climate Zone	3			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Solid Waste - Waste generation per Subsection 4.17

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	164.16	8.00

2.0 Emissions Summary

2.1 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0594	0.0000	1.4000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.7000e-004	2.7000e-004	0.0000	0.0000	2.9000e-004
Energy	1.1200e-003	0.0102	8.5900e-003	6.0000e-005		7.8000e-004	7.8000e-004		7.8000e-004	7.8000e-004	0.0000	55.8779	55.8779	2.2400e-003	6.2000e-004	56.1179
Waste						0.0000	0.0000		0.0000	0.0000	1.6239	0.0000	1.6239	0.0960	0.0000	3.6393
Water						0.0000	0.0000		0.0000	0.0000	0.2227	3.3722	3.5949	0.2912	1.5000e-003	10.1740
Total	**0.0605**	**0.0102**	**8.7300e-003**	**6.0000e-005**	**0.2897**	**7.8000e-004**	**0.2904**	**0.0711**	**7.8000e-004**	**0.0719**	**1.8466**	**59.2504**	**61.0970**	**0.3894**	**2.1200e-003**	**69.9315**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0594	0.0000	1.4000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.7000e-004	2.7000e-004	0.0000	0.0000	2.9000e-004
Energy	1.1200e-003	0.0102	8.5900e-003	6.0000e-005		7.8000e-004	7.8000e-004		7.8000e-004	7.8000e-004	0.0000	55.8779	55.8779	2.2400e-003	6.2000e-004	56.1179
Waste						0.0000	0.0000		0.0000	0.0000	1.6239	0.0000	1.6239	0.0960	0.0000	3.6393
Water						0.0000	0.0000		0.0000	0.0000	0.2227	3.3722	3.5949	0.2912	1.5000e-003	10.1736
Total	**0.0605**	**0.0102**	**8.7300e-003**	**6.0000e-005**	**0.2897**	**7.8000e-004**	**0.2904**	**0.0711**	**7.8000e-004**	**0.0719**	**1.8466**	**59.2504**	**61.0970**	**0.3894**	**2.1200e-003**	**69.9311**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**5.0049e-004**

3.0 Energy Detail

Historical Energy Use: N

3.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	44.7492	44.7492	2.0200e-003	4.2000e-004	44.9214
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	44.7492	44.7492	2.0200e-003	4.2000e-004	44.9214
NaturalGas Mitigated	1.1200e-003	0.0102	8.5900e-003	6.0000e-005		7.8000e-004	7.8000e-004		7.8000e-004	7.8000e-004	0.0000	11.1287	11.1287	2.1000e-004	2.0000e-004	11.1964
NaturalGas Unmitigated	1.1200e-003	0.0102	8.5900e-003	6.0000e-005		7.8000e-004	7.8000e-004		7.8000e-004	7.8000e-004	0.0000	11.1287	11.1287	2.1000e-004	2.0000e-004	11.1964

3.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Medical Office Building	208544	1.1200e-003	0.0102	8.5900e-003	6.0000e-005		7.8000e-004	7.8000e-004		7.8000e-004	7.8000e-004	0.0000	11.1287	11.1287	2.1000e-004	2.0000e-004	11.1964
Total		**1.1200e-003**	**0.0102**	**8.5900e-003**	**6.0000e-005**		**7.8000e-004**	**7.8000e-004**		**7.8000e-004**	**7.8000e-004**	**0.0000**	**11.1287**	**11.1287**	**2.1000e-004**	**2.0000e-004**	**11.1964**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Medical Office Building	208544	1.1200e-003	0.0102	8.5900e-003	6.0000e-005		7.8000e-004	7.8000e-004		7.8000e-004	7.8000e-004	0.0000	11.1287	11.1287	2.1000e-004	2.0000e-004	11.1964
Total		**1.1200e-003**	**0.0102**	**8.5900e-003**	**6.0000e-005**		**7.8000e-004**	**7.8000e-004**		**7.8000e-004**	**7.8000e-004**	**0.0000**	**11.1287**	**11.1287**	**2.1000e-004**	**2.0000e-004**	**11.1964**

3.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Medical Office Building	153824	44.7492	2.0200e-003	4.2000e-004	44.9214
Total		**44.7492**	**2.0200e-003**	**4.2000e-004**	**44.9214**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Medical Office Building	153824	44.7492	2.0200e-003	4.2000e-004	44.9214
Total		**44.7492**	**2.0200e-003**	**4.2000e-004**	**44.9214**

4.0 Area Detail

4.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0594	0.0000	1.4000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.7000e-004	2.7000e-004	0.0000	0.0000	2.9000e-004
Unmitigated	0.0594	0.0000	1.4000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.7000e-004	2.7000e-004	0.0000	0.0000	2.9000e-004

4.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0594					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.4000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.7000e-004	2.7000e-004	0.0000	0.0000	2.9000e-004
Total	**0.0594**	**0.0000**	**1.4000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.7000e-004**	**2.7000e-004**	**0.0000**	**0.0000**	**2.9000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Consumer Products	0.0594					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.4000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.7000e-004	2.7000e-004	0.0000	0.0000	2.9000e-004
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0594**	**0.0000**	**1.4000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.7000e-004**	**2.7000e-004**	**0.0000**	**0.0000**	**2.9000e-004**

5.0 Water Detail

5.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	3.5949	0.2912	1.5000e-003	10.1736
Unmitigated	3.5949	0.2912	1.5000e-003	10.1740

5.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Medical Office Building	1.9073 / 0.363296	3.5949	0.2912	1.5000e-003	10.1740
Total		**3.5949**	**0.2912**	**1.5000e-003**	**10.1740**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Medical Office Building	1.9073 / 0.363296	3.5949	0.2912	1.5000e-003	10.1736
Total		**3.5949**	**0.2912**	**1.5000e-003**	**10.1736**

6.0 Waste Detail

6.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1.6239	0.0960	0.0000	3.6393
Unmitigated	1.6239	0.0960	0.0000	3.6393

6.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Medical Office Building	8	1.6239	0.0960	0.0000	3.6393
Total		**1.6239**	**0.0960**	**0.0000**	**3.6393**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Medical Office Building	8	1.6239	0.0960	0.0000	3.6393
Total		**1.6239**	**0.0960**	**0.0000**	**3.6393**

APPENDIX B

Biological Resources Assessment

Biological Resources Assessment

RESD Vina Helitack Base
Tehama County, California

May 23, 2014

Prepared For:

California Department of Forestry and Fire Protection (CAL FIRE)
and
State of California – Department of General Services
Real Estate Services Division

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

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1.0 INTRODUCTION

At the request of the State of California Real Estate Services Division, ECORP Consulting, Inc. (ECORP) has conducted a biological resource assessment (BRA) for the RESD Vina Helitack Base (Property), in Tehama County, California. The 7.4±-acre site was developed in 1955 as a single engine fire station and in 1974 a Helitack base was established at the site. Currently, the facility serves a primary response area in Tehama, Glenn, Butte, and Shasta counties. The Vina Helitack Base also services portions of Lassen, Plumas, Trinity, and Mendocino National Forests. The current facility has structural and operational deficiencies that necessitate the need to replace the facility. The objective of the Project is to replace the facility with a new, modern Helitack facility that would allow the base to continue to provide fire protection, emergency-response service, and accommodate the aviation and event-response needs of the facility.

1.1 Property Location

The Proposed Project is located in northern California adjacent to State Highway (Hwy) 99. The 7.4-acre site is approximately 25 miles southeast of the City of Red Bluff and 18 miles northwest of the City of Chico, near the unincorporated community of Vina in Tehama County. The Project site is located in Section 18, T24N, R1W Mount Diablo Base Meridian (MDBM) on the "Vina, California" 7.5-minute quadrangle (United States Geologic Survey [USGS] 1976). The approximate center of the site is located approximately at Latitude 39° 55' 42.49" and Longitude -121° 1' 39.58" within the Big Chico Creek-Sacramento River Watershed (Hydrologic Unit Code [HUC] #18020157 [USGS 1978]).

1.2 Project Description

The Proposed Project would involve the replacement and expansion of the existing CAL FIRE Vina Helitack Base complex. The Project would include the demolition and new construction of several elements. The improvements on the site would include the following:

- 22-bed barracks building,
- three-bay apparatus building,
- generator/pump/storage building,
- five-blade helicopter hangar (to occur at a later date but is included as a part of this environmental analysis)
- re-constructed primary helipad and a new secondary helipad,
- relocated helicopter fueling infrastructure,
- training tower apparatus, and,
- improvements to Hwy 99 including the construction of new southbound deceleration and acceleration lanes, the reconstruction of the northbound lane configuration to accommodate the new lanes, new driveway approach apron, and new roadway drainage infrastructure.

The new buildings would be designed to meet the State of California – DGS Tier 1 Energy and Sustainability lists. Tier 2 items would be considered in the design and implemented if cost effective. In addition, the buildings would be designed to meet the US Green Building Council's Leadership in Energy and Environmental Design (LEED) requirements to attain a Silver rating.

In addition to the improvements described above, the Project would include the following additional components:

On-site

- Demolition of the existing barracks/administration building, demolition of the existing two-bay apparatus building, demolition of the existing storage building, demolition of the existing septic system. Perimeter and helicopter pad fence, remove jet fuel tank and pumps, helicopter pad, miscellaneous pavements, rock retaining wall, remove fuel vault and demo pad, demo utilities, demo propane tanks and service, and remove/demo one tree. Demolition of the existing helicopter hangar would occur at a later date but is included as part of this environmental analysis.
- Construction of new improvements consisting of site grading, paving for road and parking areas, water supply, storage and distribution systems, wastewater disposal systems, drainage systems, and erosion control measures.
- Construction of a new paved driveway/access way around the southern portion of the Project site.
- A new 60 foot long by 6 foot wide hose wash rack.
- Two new aboveground water storage tanks (10,000 gallon for domestic water use and 20,000 gallon for fire suppression) and concrete support slabs.
- Installations of a new +/-500-foot-deep domestic water supply well, well support improvements to include a new water filtration system, and domestic and fire water distribution systems.
- Two new 1,000-gallon propane tanks, concrete support pads, and underground gas distribution system.
- A new 12,000-gallon aboveground jet fuel tank, concrete support slab, and a fuel dispensing system.
- A new 2,000-gallon self-contained aboveground fuel tank with dispensing stations and concrete support slab. Tanks would be internally divided to provide 1,000-gallon diesel and 500 gallon gasoline.
- A new standard septic system consisting of an approximately 600 foot leach field, a 1,500 gallon septic tank (minimum), and a 600-foot, 6-inch gravity main.
- A new storm water collection system consisting of approximately 300 foot of a 12-inch underground storm drain; four drain inlets; 500-foot, 6-inch drain connecting building downspouts; and surface water swales to existing drainage systems.
- A drain system for the new wash rack including trench drain, oil/water separator, and diverter valve to connect to the septic system.
- A new 30-foot-tall radio tower and foundation.
- A new free-standing wood and steel framed training tower, complete with steel stairway, non-slip deck, railings, and an aircraft fuselage.
- New site lighting throughout, including helipad lighting, approach slope indicator lighting system, flag pole, and road identification sign lighting.
- New site landscaping and irrigation system.
- New fire sprinkler system in the existing helicopter hangar building.

- New perimeter fencing: approximately 2,000 feet of 6 foot-tall chain link fencing;
- New automatic gate, which controls access to the site.
- New flag pole with in-ground mounted light.
- New underground electrical and telephone distribution systems.
- New solar power system including photovoltaic solar panels.
- New CAL FIRE station sign and platform.

Off-site

- Widening of Hwy 99 to allow for new left turn lane into Project site and right turn merging lane out of the Project site going south on Hwy 99. This would also involve the shifting of the existing travel lanes requiring the need for additional pavement and a new gravel shoulder on the north-bound side of the roadway (east side of the existing roadway).

1.3 Biological Setting

The Vina Helitack Base complex is located in the northeastern part of the Sacramento Valley California Floristic Province (Baldwin et al. 2012). This is the wetter and cooler area of California's Great Central Valley, and the area is generally characterized by grasslands, marshes, vernal pools, riparian woodlands, and valley oak (*Quercus lobata*) woodlands. The area features a Mediterranean climate with cool, wet winters and hot, dry summers (Orme 2002). The hottest month is July, with an average maximum temperature of 98° F at Red Bluff, approximately 18 miles northwest of the project site (Western Regional Climate Center 2014). Annual yearly precipitation is 23.5 inches of rain, with the majority falling in November, December, and January. The elevation at the Project site is approximately 250 feet above mean sea level (MSL) and the site slopes from 260 feet MSL at the northeast to 235 feet MSL at the edge of Hwy 99. The Project sits within the Vina Plains, which are a naturally occurring annual grassland and vernal pool complex located in northern Butte and Southern Tehama Counties located on the upper terrace of the Sacramento Valley floor. The Project site is an isolated, naturally occurring hill slightly elevated above the surrounding vernal pool and grassland plateau.

Land use in the region is primarily agricultural. Livestock grazing and ranching are the primary land uses immediately surrounding the site. Lands located west of the Project site are generally typified by orchard and tree crops. Rural residential dwellings and out-buildings are located in the regional vicinity of the Project site.

2.0 REGULATORY SETTING

2.1 Federal Regulations

2.1.1 Federal Endangered Species Act

The Federal Endangered Species Act (FESA) protects plants and animals that are listed as endangered or threatened by the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). Section 9 of FESA prohibits the taking of endangered wildlife, where taking is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 CFR 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or

destroying any endangered plant on federal land and removing, cutting, digging up, damaging, or destroying any endangered plant on non-federal land in knowing violation of state law (16 USC 1538). Under Section 7 of FESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed (or proposed) species (including plants) or its critical habitat. Through consultation and the issuance of a biological opinion (BO), the USFWS may issue an incidental take statement allowing take of the species that is incidental to an otherwise authorized activity provided the activity will not jeopardize the continued existence of the species. Section 10 of FESA provides for issuance of incidental take permits where no other federal actions are necessary provided a habitat conservation plan is developed.

2.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the United States and other nations devised to protect migratory birds, any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. As authorized by the MBTA, the USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. The regulations governing migratory bird permits can be found in 50 CFR part 13 General Permit Procedures and 50 CFR part 21 Migratory Bird Permits. The State of California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the California Fish and Game Code.

2.1.3 Federal Clean Water Act

The federal Clean Water Act's (CWA) purpose is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA prohibits the discharge of dredged or fill material into "Waters of the United States" without a permit from the U.S. Army Corps of Engineers (USACE). The definition of Waters of the U.S. includes rivers, streams, estuaries, the territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 7b). The U.S. Environmental Protection Agency (EPA) also has authority over wetlands and may override a USACE permit.

Substantial impacts to wetlands may require an individual permit. Projects that only minimally affect wetlands may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the Regional Water Quality Control Board (RWQCB).

2.2 State Regulations

2.2.1 California Endangered Species Act

The California Endangered Species Act (CESA) generally parallels the main provisions of the FESA, but unlike its federal counterpart, CESA applies the take prohibitions to species proposed for listing (called "candidates" by the state). Section 2080 of the California Fish and Game Code prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless

otherwise authorized by permit or in the regulations. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects. State lead agencies are required to consult with CDFW to ensure that any action they undertake is not likely to jeopardize the continued existence of any endangered or threatened species or result in destruction or adverse modification of essential habitat.

2.2.2 Fully Protected Species

The State of California first began to designate species as "fully protected" prior to the creation of the CESA and FESA. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction, and included fish, amphibians and reptiles, birds, and mammals. Most fully protected species have since been listed as threatened or endangered under CESA and/or FESA. The regulations that implement the Fully Protected Species Statute (Fish and Game Code Section 4700) provide that fully protected species may not be taken or possessed at any time. Furthermore, CDFW prohibits any state agency from issuing incidental take permits for fully protected species, except for necessary scientific research.

2.2.3 Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 (Fish and Game Code Sections 1900-1913) was created with the intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA is administered by CDFW. The Fish and Wildlife Commission has the authority to designate native plants as "endangered" or "rare" and to protect endangered and rare plants from take. The CESA of 1984 (Fish and Game Code Section 2050-2116) provided further protection for rare and endangered plant species, but the NPPA remains part of the Fish and Game Code.

2.2.4 California Streambed Alteration Notification/Agreement

Section 1602 of the Fish and Game Code requires that a Streambed Alteration Application be submitted to CDFW for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake." The CDFW reviews the proposed actions and, if necessary, submits to the Applicant a proposal for measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by CDFW and the Applicant is the Streambed Alteration Agreement. Often, projects that require a Streambed Alteration Agreement also require a permit from the USACE under Section 404 of the CWA. In these instances, the conditions of the Section 404 permit and the Streambed Alteration Agreement may overlap.

2.2.5 CEQA Significance Criteria

Section 15064.7 of the CEQA Guidelines encourages local agencies to develop and publish the thresholds that the agency uses in determining the significance of environmental effects caused by projects under its review. However, agencies may also rely upon the guidance provided by the expanded Initial Study checklist contained in Appendix G of the CEQA Guidelines. Appendix G provides examples of impacts that would normally be considered significant. Based on these examples, impacts to biological resources would normally be considered significant if the project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and
- Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat conservation plan.

An evaluation of whether or not an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, state, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important but not significant according to CEQA. The reason for this is that although the impacts would result in an adverse alteration of existing conditions, they would not substantially diminish, or result in the permanent loss of an important resource on a population-wide or region-wide basis.

2.3 Local Regulations

2.3.1 Tehama County General Plan and 2008–2028 Update

The Tehama County General Plan and 2008–2028 update serve to inform and assist citizens, developers, and decision-makers in formulating and implementing the County's rules guiding development and programs. The Open Space and Conservation Elements address agricultural lands, timber resources, water quality, water resources, wildlife resources, mineral production, natural land resources, and historic and archeological resources.

3.0 METHODS

Resource data for this document resulted from a biological field survey conducted by ECORP biologist Eric Stitt on 12 March, 2014. Conditions were ideal for the survey: temperature was 68° F, a breeze of 8 to 12 mph was blowing, skies were cloudless, and significant precipitation had occurred within the last two days. However, drought conditions were in effect, with the area receiving significantly less than average rainfall in the months leading up to the survey. As a result, vegetation was far behind in terms of blooming phenology and very few plant species were readily identifiable.

Prior to the site visit, the CDFW's California Natural Diversity Database (CNDDB) (CDFW 2014) and California Native Plant Society Electronic Inventory (CNPS 2014) were queried to determine special-status

species documented within five miles of the site. Additional data regarding the potential occurrence of special-status species were gathered from various online websites and databases such as Calflora and USFWS species lists. Soil types were determined using the United States Department of Agriculture National Resource Conservation Service Web Soil Survey (NRCS 2014).

3.1 Special-Status Species

Using information from CNDDB, the literature review, and observations in the field, a list of special-status plant and animal species that have the potential to occur on the site was generated (Table 1. *Special-Status Species*). Each of these species was assessed for their potential to occur on-site based on the following criteria guidelines:

Present	Species was observed during the site visit or is known to occur within the project boundary based on documented occurrences within the CNDDB.
Potential to Occur	Habitat (including soils and elevation requirements) for the species occurs within the project boundary.
Low Potential to Occur	Marginal or limited amounts of habitat occurs and/or the species is not known to occur in the vicinity based on CNDDB records and other available documentation.
Absent	No suitable habitat (including soils and elevation requirements) and/or the species is not known to occur in the vicinity based on CNDDB records and other available documentation.

Table 1. Special-Status Species

Common Name	Scientific Name	Federal ESA Status	California ESA Status	Other Status	Habitat Description	Approximate Survey Dates	Potential to Occur On-site
Plants							
Henderson's Bent Grass	*Agrostis hendersonii*			3	Occurs in vernal pools and mesic areas in valley and foothill grassland (230' - 1,001' MSL).	April - June	Absent
Depauperate Milk-vetch	*Astragalus pauperculus*			4	Found in vernally mesic, volcanic areas in chaparral, cismontane woodland, and valley and foothill grassland (197' - 3,986' MSL).	March - June	Absent
Ferris' Milk-vetch	*Astragalus tener var. ferrisae*			1B	Occurs on vernally mesic meadows and seeps and subalkaline flats in valley and foothill grassland (7' – 246' MSL).Presumed extirpated in the Vina vicinity.	April - May	Absent
Round-leaved Filaree	*California macrophylla*			1B	Found on clay soils in cismontane woodland and valley and foothill grassland (49' - 3,937' MSL).	March - May	Absent
Pink Creamsacs	*Castilleja rubicundula var. rubicundula*			1B	Occurs on serpentine soils in cismontane woodland, openings in chaparral, meadows and seeps, and valley and foothill grassland (66' - 2,986' MSL).	April - June	Absent
Hoover's Spurge	*Chamaesyce hooveri*	FT		1B	A species of vernal pools (82' - 820' MSL).	July - October	Absent
Stony Creek Spurge	*Chamaesyce ocellata ssp. rattanii*			1B	Found in chaparral and valley and foothill grassland 255 - 2400 feet MSL.	May - October	Absent
Silky Cryptantha	*Cryptantha crinita*			1B	Occurs in gravelly streambeds in cismontane woodland, lower montane coniferous forest, riparian forest, riparian woodland, and valley and foothill grassland (200' - 3,986' MSL).	April - May	Absent
Dwarf Downingia	*Downingia pusilla*	-	-	2	Occurs in vernal pools and mesic areas in valley and foothill grassland (3' - 1,460' MSL).	March-May	Absent

Common Name	Scientific Name	Federal ESA Status	California ESA Status	Other Status	Habitat Description	Approximate Survey Dates	Potential to Occur On-site
Adobe Lily	*Fritillaria pluriflora*			1B	Often found on adobe soils in chaparral, cismontane woodland, and valley and foothill grassland from 180 – 2100 feet MSL.	February - April	Low Potential to Occur
Boggs Lake Hedge-hyssop	*Gratiola heterosepala*	-	CE	1B	Found on clay soils in vernal pools, marshes and swamps or on lake margins (33' - 7,792' MSL).	April-August	Absent
Hogwallow Starfish	*Hesperevax caulescens*			4	Occurs in shallow vernal pools in mesic, clay valley and foothill grassland (0'-1,657' MSL).	March - June	Absent
Coulter's Goldfields	*Lasthenia glabrata ssp. coulteri*			1B	Found in marshes and swamps, playas, and vernal pools from sea level to 1 – 3660 feet MSL.	February - June	Absent
Legenere	*Legenere limosa*	-	-	1B	Occurs in vernal pools (3' - 2,887' MSL).	April-June	Absent
Butte County Meadowfoam	*Limnanthes floccosa ssp. californica*	FE	CE	1B	Found in mesic areas in valley and foothill grassland and vernal pools (151' - 3,051' MSL).	March - May	Absent
Woolly Meadowfoam	*Limnanthes floccosa ssp. floccosa*			4	Occurs in vernally mesic areas in chaparral, cismontane woodland, valley and foothill grassland, and vernal pools (197' - 4,380' MSL).	March - June	Absent
Shield-bracted Monkeyflower	*Mimulus glaucescens*			4	Found on serpentine soils in seeps and streambanks within chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland from 180 to 60 – 3720 feet MSL.	February - September	Absent
Tehama Navarretia	*Navarretia heterandra*			4	Found in mesic areas in valley and foothill grassland and vernal pools (100' - 3,310' MSL).	April - June	Absent
Baker's Navarretia	*Navarretia leucocephala ssp. bakeri*			1B	Occurs in mesic areas in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools (16' - 5,709' MSL).	April - July	Absent
Adobe Navarretia	*Navarretia nigelliformis ssp. nigelliformis*			4	Found on clay or serpentine soils in mesic valley and foothill grasslands, sometimes in vernal pools from 300 to 3,000 feet MSL.	April - June	Absent
Hairy Orcutt Grass	*Orcuttia pilosa*	FE	CE	1B	Occurs in vernal pools (180' - 660' MSL).	May - September	Absent
Slender Orcutt Grass	*Orcuttia tenuis*	FT	CE	1B	Found in gravelly vernal pools (115' - 5,774' MSL).	May-October	Absent
Ahart's Paronychia	*Paronychia aharti*			1B	Occurs in cismontane woodland, valley and foothill grassland, and vernal pools (98' - 1,673' MSL).	February - June	Absent
Bidwell's Knotweed	*Polygonum bidwelliae*			4	Found on volcanic soils in chaparral, cismontane woodland, and valley and foothill grassland from 180 to 60 – 3600 feet MSL.	April - July	Absent
Sanford's Arrowhead	*Sagittaria sanfordii*	-	-	1B	Found in shallow freshwater marshes and swamps (0' - 2,133' MSL).	May-October	Absent
Greene's Tuctoria	*Tuctoria greenei*	FE	CR	1B	Occurs in vernal pools (98' - 3,511' MSL).	May - September	Absent
Invertebrates							
Conservancy Fairy Shrimp	*Branchinecta conservatio*	FE	-	-	Found in vernal pools and ephemeral wetlands.	November-April	Absent
Vernal Pool Fairy Shrimp	*Branchinecta lynchi*	FT	-	-	Found in vernal pools and ephemeral wetlands.	November-April	Low Potential to Occur
Vernal Pool Tadpole Shrimp	*Lepidurus packardi*	FE	-	-	Found in vernal pools and ephemeral wetlands.	November-April	Absent

Common Name	Scientific Name	Federal ESA Status	California ESA Status	Other Status	Habitat Description	Approximate Survey Dates	Potential to Occur On-site
California Linderiella	*Linderiella occidentalis*	-	-	CNDDB	Found in vernal pools and ephemeral wetlands.	November-April	Low Potential to Occur
Antioch Dunes Anthicid Beetle	*Anthicus antiochensis*	-	-	CNDDB	Uses sand dunes and sand bars- extirpated from type locality but present in several places along the Sacramento and Feather Rivers.	March - May	Absent
Sacramento Anthicid Beetle	*Anthicus sacramento*	-	-	CNDDB	Found in sand dunes and sand bars.	November-April	Absent
Valley Elderberry Longhorn Beetle	*Desmocerus californicus dimorphus*	FT, FPD	-	-	Uses elderberry shrubs (*Sambucus* sp.) as obligate host plant for larvae.	any season	Absent
Fish							
Chinook Salmon (Central Valley Spring-run ESU)	*Oncorhynchus tshawytscha*	FT	CT	-	Needs undammed rivers, streams, and creeks.		Absent
Amphibians							
Western Spadefoot (breeding)	*Spea hammondii*	-	-	CSC	California endemic species of vernal pools, swales, wetlands and adjacent grasslands throughout the Central Valley.	March-May	Low Potential to Occur
Birds							
White-tailed Kite (nesting)	*Elanus leucurus*	-	-	CFP	Nests in large trees in woodlands or grasslands.	March-June	Absent
Northern Harrier (nesting)	*Circus cyaneus*	-	-	CSC	Nests on the ground near marshes, grasslands.	April-September	Absent
Swainson's Hawk (nesting)	*Buteo swainsoni*	-	CT	BCC	Nests in large trees in grassland, riparian areas.	March-August	Absent
Prairie Falcon (nesting)	*Falco mexicanus*	-	-	BCC	Nests in cliffs or ledges overlooking grasslands.	October-February	Absent
Osprey	*Pandion haliaetus*	-	-	CNDDB	Makes large nests on tall trees overlooking open water.	March-September	Absent
Ferruginous Hawk (wintering)	*Buteo regalis*	-	-	CNDDB	Makes large nests on tall trees overlooking grassland.	November-February	Absent
Golden Eagle (nesting and wintering)	*Aquila chrysaetos*	-	-	BCC, CFP	Uses tall trees overlooking grasslands.	nest (February-August); winter CV (October-February)	Absent
Burrowing Owl (burrow sites)	*Athene cunicularia*	-	-	BCC, CSC	Nests in California ground squirrel (*Otospermohilus beecheyi*) burrows in grasslands, open areas, rural edges.	March-August	Potential to Occur
Short-eared Owl (nesting)	*Asio flammeus*	-	-	CSC	Nests on the ground in grasslands.	March-July (nesting)	Absent
Long-billed Curlew (wintering)	*Numenius americanus*	-	-	BCC	Nests on the ground in grasslands and pastures.	September-March	Low Potential to Occur
Western Yellow-billed Cuckoo	*Coccyzus americanus*	FC	CE	BCC	A species of dense riparian zones.	June 15-Aug 15	Absent
Bank Swallow	*Riparia riparia*	-	CT	-	Nests in steep, sandy stream banks	May-July	Absent
Loggerhead Shrike	*Lanius ludovicianus*	-	-	BCC, CSC	A species of grasslands, open xeric areas, some woodlands.	March-July	Potential to Occur
Grasshopper Sparrow	*Ammodramus savannarum*	-	-	CSC	Nests on the ground in grasslands.	May-July	Low Potential to Occur
Tricolored Blackbird	*Agelaius tricolor*	-	-	BCC, CSC	Forms dense nesting colonies in marshes and grasslands	April-June	Absent
Mammals							
Silver-haired Bat	*Lasionycteris noctivagans*	-	-	CNDDB	Roosts in hollow trees, snags, under bark.	April-September	Absent

Common Name	Scientific Name	Federal ESA Status	California ESA Status	Other Status	Habitat Description	Approximate Survey Dates	Potential to Occur On-site
Hoary Bat	*Lasiurus cinerus*	-	-	CNDDB	Roosts in dense foliage of medium to large trees, especially fan palms.	April-September	Absent
Western Red Bat	*Lasiurus blossevillii*	-	-	CNDDB	Roosts in trees in riparian woodlands, orchards.	April-September	Absent
Western Mastiff Bat	*Eumops perotis californicus*	-	-	CSC	Roosts in mines, rocky ledges, structures, vertical cliff faces.	April-September	Absent

Status Codes:

FE - Federal ESA listed, Endangered.
FT - Federal ESA listed, Threatened.
FPE - Formally Proposed for federal ESA listing as Endangered.
FPT - Formally Proposed for federal ESA listing as Threatened.
FPD - Listed under Federal ESA, but formally proposed for delisting.
Fd - Formally Delisted (delisted species are monitored for 5 years).
FC - Candidate for federal ESA listing as Threatened or Endangered.
NMFS - NOAA/NMFS species of concern
BCC - U. S. Fish and Wildlife Service Bird of Conservation Concern (USFWS, 2008
CE - California ESA or Native Plant Protection Act listed, Endangered.
CT - California ESA or Native Plant Protection Act listed, Threatened.
CR - California ESA or Native Plant Protection Act listed, Rare.
CC - Candidate for California ESA listing as Endangered or Threatened.
CFP - Fish and Game Code of California Fully Protected Species (§3511-birds, §4700-mammals, §5050-reptiles/amphibians).
CSC - California Department of Fish and Game Species of Special Concern (CDFG, updated August 2004).
1A - California Rare Plant Rank/Presumed extinct.
1B - California Rare Plant Rank/Rare or Endangered in California and elsewhere.
2A - California Rare Plant Rank/Presumed extirpated in California, more common elsewhere.
2B - California Rare Plant Rank/Rare or Endangered in California, more common elsewhere.
3 - California Rare Plant Rank/Plants About Which More Information is Needed - A Review List.
4 - California Rare Plant Rank/Plants of Limited Distribution - A Watch List.
CNDDB - Species that is tracked by CDFG's Natural Diversity Database but does not have any of the above special-status designations otherwise.

Potential Occurrence Codes:

Present-Species was observed during the site visit or is known to occur within the project boundary based on documented occurrences within the CNDDB.
Potential-Habitat (including soils and elevation requirements) for the species occurs within the project boundary.
Low Potential-Marginal or limited amounts of habitat occurs and/or the species is not known to occur in the vicinity based on CNDDB records and other available documentation.
Absent-No suitable habitat (including soils and elevation requirements) and/or the species is not known to occur in the vicinity based on CNDDB records and other available documentation.

3.2 Wetland Delineation

A wetland delineation was conducted in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0* (Arid West Region Supplement) (U.S. Army Corps of Engineers 2008). The boundaries of potential Waters of the U.S. were delineated through aerial photograph interpretation and standard field methodologies. *The Jepson Manual* (Baldwin *et al.* eds. 2012) was used for plant nomenclature and identification.

4.0 RESULTS

4.1 Site Characteristics and Land Use

The Project site is situated on a naturally-occurring hill which abuts Hwy 99 to its west and undeveloped pastureland/rangeland to the north, east, and south. The site is fenced and landscaped. Pavement, parking lots, and lawns surround the on-site buildings, and small ornamental trees are placed at edges. The rest of the site is regularly mowed. Representative site photos are shown in Attachment A.

Orchards and agricultural fields occur approximately ½ mile west and north of the Project site. The nearest community is Vina, approximately 1.3 miles northwest of the Project. The Project site is designated by Tehama County within the *Valley Floor Agriculture* land use designation on the Tehama County General Plan Land Use Map and has a zoning designation of *A-2 (Agricultural/Valley District)*. Vina Plains Preserve, a 4,600-acre vernal pool complex preserved by The Nature Conservancy, occurs southeast of the project site in southern Tehama and northern Butte Counties. The preserve and the Earl Floor Ranch Conservation Area to its north were established in order to preserve numerous vernal pool-endemic plants and animals found in the area, including many of those listed in Table 1 (above).

4.2 Plant Communities

Plant communities within the Helitack site include developed/landscaped areas with planted lawns and small ornamental trees, and annual grassland consisting of medusahead (*Elymus caput-medusae*), rye grass (*Festuca perennis*), barley (*Hordeum murinum*), oats (*Avena fatua*), star thistle (*Centaurea solstitialis*), and storksbill (*Erodium botrys*). Roadside vegetation in the Hwy 99 alignment consists of similar species.

4.3 Wildlife

The Vina Helitack site is located within an extensive grassland/vernal pool matrix. Commonly occurring species within northern California grasslands include western toad (*Anaxyrus boreas*), Sierra chorus frog (*Pseudacris sierra*), western fence lizard (*Sceloporus occidentalis*), skinks (*Plestiodon* sp.), gopher snake (*Pituophis catenifer*), garter snakes (*Thamnophis sp.*), and Northern Pacific rattlesnake (*Crotalus oreganus*). Mammals including Audubon's cottontail (*Sylvilagus audubonii*) and coyote (*Canis latrans*) could be expected, and abundant black-tail jackrabbit (*Lepus californicus*), California vole (*Microtus californicus*) were observed during the site visit. Common bird species include western meadowlark (*Sturnella neglecta*), Northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macroura*), horned larks (*Eremophila alpestris*), and savannah sparrow (*Passerculus sandwichensis*). Most birds with potential to nest in the project area are covered under the Migratory Bird Treaty Act (MBTA), which protects breeding birds, their nests, eggs, and young during the breeding season (typically February 1 to October 1).

4.4 Soils

There are three soil units mapped within the site (Figure 2. *Natural Resource Conservation Service Soil Types*) (U.S. Department of Agriculture, NRCS 2014). These are: (Ad) Anita clay; (RnB) Redding gravelly loam 3 to 8 percent slopes; and (TtB) Tuscan clay loam, 1 to 8 percent slopes. None of these units usually contain hydric inclusions (U.S. Department of Agriculture, Soil Conservation Service 1967). Characteristic of this area, soils on the project site are underlain by an impervious durapan which restricts water percolation (TNC 1994).

4.5 Waters of the U.S.

A wetland delineation was performed at the Vina Helitack site. A total of 0.019 acres of Waters of the U.S. were mapped, including a seasonal wetland and a ditch (Table 2, Figure 3. *Draft Wetland Delineation*).

Table 2. Potential Waters of the U.S.

Habitat Type	Impact
Seasonal Wetland	0.002 ac.
Ditch	0.017 ac.
GRAND TOTAL:	0.019 ac.

4.5.1 Seasonal Wetland

Seasonal wetlands are ephemeral features wetted due to the accumulation of surface runoff and rainwater into low-lying areas. Inundation tends to be short and they are often dominated by non-native hydrophytic species. One small seasonal wetland of approximately 0.002 acre in size occurs in the off-site road improvement area. Plant species identified within the seasonal wetland included barley (*Hordeum* sp.), Italian ryegrass (*Festuca perennis*), storksbill (*Erodium botrys*), and hairy hawkbit (*Leontodon taraxicoides*). Due to drought conditions, plants had only recently started growing and other species present were not identifiable.

4.5.2 Ditch

Drainage ditches are constructed linear features meant to convey water to or from its desired location. They may be vegetated or not, and may or may not feature a high water mark. For the purposes of this assessment ditches were identified by the presence of water and their location as drainage features on the side of the road. Ditches were vegetated with an assortment of grasses (not yet in bloom). One ditch of approximately 0.017 acre in size runs along the roadside in the off-site road improvement area. At the culvert under the driveway access to the Helitack facility, water was ponded and approximately ½ meter deep.

4.6 Special-Status Plants

No special-status plants were found within the Vina Helitack Base site during biological reconnaissance, and habitat for most rare plant species is lacking. The on-site improvement area is frequently mowed and landscaped, so no potential exists for rare plants within the Vina Helitack site. Adobe lily (*Fritillaria pluriflora*) has been found nearby and has minor potential to occur in the off-site roadside improvement area. This species blooms from February through April and occurs on adobe (heavy clay), or occasionally, serpentine soils (CNPS 2014). This species was not observed in-bloom during the survey, and no vegetative liliaceous rosettes (emerging plants) were noted. To date, no field surveys have been conducted so this species cannot be excluded from consideration. USFWS-designated Critical Habitat for Greene's tuctoria, Hoover's spurge, Hairy orcutt grass, and slender orcutt grass occurs within five miles to the northeast of the site but habitat is not present for these species in the on-site or off-site areas.

4.6.1 Arborist Survey

Few trees appear on the site. Those that are present are limited to ornamental non-native species and an arborist survey is probably not required.

4.7 Special-Status Wildlife

A number of special-status animal species have been documented to occur within five miles of the project (Figure 4. *CNDDB Occurrences of Special-Status Species*) (CDFW 2014). Many of these are affiliated with either the Sacramento River, which occurs approximately 2.75 miles west, or the Vina Plains Preserve

which occurs immediately southeast of the project site. Table 1 includes these and other special-status animals that may occur in the vicinity. To date, no field surveys have been conducted on-site according to agency promulgated protocols for special status wildlife species.

4.7.1 Invertebrates

Although unlikely, the seasonal wetland and pooled portions of ditches in the off-site roadside easement may represent potentially suitable habitat for vernal pool fairy shrimp (*Branchinecta lynchi*) and the CNDDB-tracked California linderiella (*Linderiella occidentalis*). Of these, California linderiella is most likely to occur. Conservancy fairy shrimp (*Branchinecta conservatio*) and vernal pool tadpole shrimp (*Lepidurus packardii*) are considered absent from the work area, given the extremely limited aquatic habitat present. There are no elderberry shrubs (*Sambucus nigra* ssp. *caerulea*), exclusive host plant for the federally threatened Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), present on-site. Likewise, sandy riverine dune habitats needed by the two Anthicid beetles are not present on-site.

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp (*B. lynchi*) is listed as threatened in accordance with the FESA. They may occur in seasonal ponds, vernal pools, and swales during the wet season, which generally occurs from December through May. This species can be found in a variety of pool sizes, ranging from smaller than 0.001 acre to more than 24.5 acres (Eriksen and Belk 1999). The shrimp hatch from cysts when colder water (10°C [50°F] or less) fills the pool and mature in as few as 18 days under optimal conditions (Eriksen and Belk 1999). At maturity, mating takes place and cysts are dropped. Vernal pool fairy shrimp occur in disjunct patches dispersed across California's Central Valley from Shasta County to Tulare County, the central and southern Coast Ranges from northern Solano County to Ventura County, and three areas in Riverside County (USFWS 2003). Vernal pool fairy shrimp have been found close to the RESD Vina Helitack Property, but surveys within the project area have not been performed to date. Habitat does not exist in the on-site portion of the project, and very little marginal habitat exists in the seasonal wetland in the off-site road improvement area. USFWS-designated Critical Habitat for vernal pool fairy shrimp occurs within five miles northeast of the site.

Valley Elderberry Longhorn Beetle

The Valley elderberry longhorn beetle is listed as threatened in accordance with the FESA (USFWS 1980). The Valley elderberry longhorn beetle is completely dependent on its host plant, elderberry (*Sambucus* sp.), which occurs in riparian and other woodland and scrub communities (USFWS 1999). Elderberry plants with one or more stems measuring 1.0 inch or greater in diameter at ground level are considered to be habitat for the species (USFWS 1999). The adult flight season extends from late March through June. During that time, the adults feed on foliage and perhaps flowers, mate, and females lay eggs on living elderberry plants (Barr 1991). The first instar larvae bore into live elderberry stems, where they develop for one to two years feeding on the pith. The fifth instar larvae create exit holes in the stems and then plug the holes and remain in the stems through pupation (Talley et al. 2007). The beetle's current distribution is patchy throughout California's Central Valley, from Shasta County to Kern County, and associated foothills up to an elevation of approximately 3,000 feet (USFWS 1999). No elderberry shrubs were found within the RESD Vina Helitack project site so this species does not occur.

Other Special-Status Invertebrates

Although unlikely, California linderiella (*Linderiella occidentalis*) may be found in association with the seasonal wetland in the off-site road improvement area. California linderiella is a small freshwater branchiopod related to the fairy shrimp (*Branchinecta*, above). Of the two vernal pool branchiopods with potential to occur in waters on-site, this is the more likely species, having the most generalist habitat needs. Antioch Dunes Anthicid Beetle (*Anthicus antiochensis*) and Sacramento Anthicid beetle (*Anthicus sacramento*) need sandy dunes, which are not present on-site.

4.7.2 Fish

Chinook salmon (Central Valley spring-run ESU) occur within 5 miles of the site in the Sacramento River, which has been designated Critical Habitat for this species. However, no habitat occurs on-site for this species.

4.7.3 Amphibians and Reptiles

Western Spadefoot

The RESD Vina Helitack Base site does not support breeding habitat for the Western spadefoot (*Spea hammondi*), but potential foraging habitat for this species may occur. The Western spadefoot is not listed pursuant to either the CESA or FESA; however, it is designated as a CDFW species of special concern. Necessary habitat components of the Western spadefoot toad include suitable underground retreats and breeding ponds. Suitable breeding sites include temporary rain pools, such as vernal pools and seasonal wetlands, or pools within portions of intermittent drainages (Jennings and Hayes 1994). Spadefoots spend most of their adult life within underground burrows or other suitable refugia such as rodent burrows. Western spadefoot are known to occur from Redding, Shasta County southward to northwestern Baja California at elevations below 4,475 feet (Jennings and Hayes 1994), and occur within five miles of the project site. None were observed during the biological field reconnaissance March 2014, and breeding habitat does not occur on-site. However, the site may be used for foraging or as refuge by this species, if present nearby.

4.7.4 Birds

Special-status birds that have been observed or could occur within the vicinity of the RESD Vina Helitack Site include white-tailed kite (*Elanus leucurus*), Northern harrier (*Circus cyaneus*), ferruginous hawk (*Buteo regalis*), Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), osprey (*Pandion haliaetus*), golden eagle (*Aquila chrysaetos*), burrowing owl (*Athene cunicularia*), short-eared owl (*Asio flammeus*), long-billed curlew (*Numenius americanus*) western yellow-billed cuckoo (*Coccyzus americanus*), loggerhead shrike (*Lanius ludovicianus*), grasshopper sparrow (*Ammodramus savannarum*), and tricolored blackbird (*Agelaius tricolor*). Of these, nesting habitat is absent for most species including the large raptors and riparian/marsh affiliated species. The following are accounts of species considered in this assessment.

White-tailed Kite

White-tailed kites are not listed pursuant to either the CESA or FESA; however, the species is fully protected under Section 3511 of the California Fish and Game Code. This species is a common resident in the Central Valley and the entire length of the California coast (Dunk 1995). In northern California,

white-tailed kites typically nest from March through June. Nesting occurs in trees within riparian, oak woodland, savannah, and agricultural communities that are found in or near foraging areas such as open grasslands, meadows, farmlands, savannahs, and emergent wetlands. No nesting habitat occurs on-site for this species.

Northern Harrier

The northern harrier is not listed pursuant to either the CESA or FESA; however, it is considered to be a species of special concern by the CDFW. This species is known to nest within the Central Valley, along the Pacific Coast, and in northeastern California. The northern harrier is a ground-nesting species, and typically nests in emergent wetland/marsh, open grasslands, or savannah communities usually in areas with dense vegetation (Macwhirter and Bildstein 1996). Foraging occurs within a variety of open environments such as marshes, agricultural fields, and grasslands. Nesting occurs during April through September. The annual grassland adjacent to the site represents potential nesting and foraging habitat for Northern harriers, but due to the extensive use of the project site, on-site conditions are unsuitable for nesting by this species.

Swainson's Hawk

The Swainson's hawk is listed as a threatened species and are protected pursuant to the CESA. This species nests in North America (Canada, western United States, and Mexico) and typically winters from South America north to Mexico. However, a small population overwinters in the Sacramento-San Joaquin River Delta (Bechard *et al.* 2010). In California, the nesting season for Swainson's hawk ranges from mid-March to late August.

Swainson's hawks nest within tall trees in a variety of wooded communities including riparian, oak woodland, roadside landscape corridors, urban areas, and agricultural areas, among others. Foraging habitat includes open grassland, savannah, low-cover row crop fields, and livestock pastures. In the Central Valley, Swainson's hawks typically feed on a combination of California vole (*Microtus californicus*), California ground squirrel (*Otospermophilus beecheyi*), ring-necked pheasant (*Phasianus colchicus*), many passerine birds, and grasshoppers (*Melanopulus* spp.). Swainson's hawks are opportunistic foragers and will readily forage in association with agricultural mowing, harvesting, disking, and irrigating (Estep 1989). The removal of vegetative cover by such farming activities results in more readily available prey items for this species. Swainson's hawks have been observed foraging within five miles of the site but nesting habitat does not occur on-site.

Prairie Falcon

The prairie falcon (*Falco mexicanus*) is designated as a bird of conservation concern by the USFWS, but otherwise has no federal special-status. Nesting occurs in the Sierra Nevada and Coast Ranges typically within canyons, cliffs, or rock outcrops adjacent to open terrain for foraging (Small 1994). Winter range includes all of California except the northwestern redwood region and highest elevations of the Sierra Nevada. Although documented within five miles of the RESD Vina Helitack Facility, nesting habitat is not present for this species on the project site.

Osprey

Osprey (*Pandion haliaetus*) is tracked by CNDDB but otherwise has no federal or state special status. This species typically nests near open water habitats including seacoasts, lagoons, bays, large rivers,

lakes with available perches and large trees as nest sites. Within California, nesting has been recorded within Modoc, Lassen, Siskiyou, Plumas, Tehama, Shasta, Trinity, Glenn County, and along the Pacific Coast from Del Norte south to Marin County (Small 1994). Nesting occurs during April through October. This species has been reported nesting near the Sacramento River, but nesting habitat does not occur within the project area.

Burrowing Owl

The burrowing owl is not listed pursuant to either the CESA or FESA; however, it is designated as a bird of conservation concern by the USFWS and a species of special concern by the CDFW. Burrowing owls inhabit dry open rolling hills, grasslands, desert floors, and open bare ground with gullies and arroyos. They can also inhabit developed areas such as golf courses, cemeteries, roadsides within cities, airports, vacant lots in residential areas, school campuses, and fairgrounds (Haug *et al.* 1993). This species typically uses burrows created by fossorial mammals, most notably the California ground squirrel (*Otospermophilus beecheyi*), but may also use man-made structures such as cement culverts or pipes; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement (CDFG 2012). The breeding season typically occurs between February 1 and August 31 (CDFG 2012). No burrowing owls were observed during the March, 2014 site reconnaissance, and ground squirrel burrows were not observed. However, the site provides potential nesting habitat for the species.

Short-eared Owl

Short-eared owl (*Asio flammeus*) is a California Department of Fish and Wildlife species of special concern and has no federal status. Typical habitat includes marshes, grasslands, meadows, river margins, and agricultural lands (Small 1994). Breeding locations are scattered throughout California including the southern Sacramento Valley (uncommon and irregular), and Grizzly Island, Solano County (a major wintering and breeding area for California) (Small 1994). Most occurrences within the Central Valley are of winter residents or migrants. Nesting of the short-eared owl on the project site is unlikely given the disturbed and active nature of the site.

Loggerhead Shrike

The loggerhead shrike (*Lanius ludovicianus*) is not listed pursuant to either the CESA or FESA, but is considered a bird of conservation concern by the USFWS and a species of special concern by the CDFW. Loggerhead shrikes nest throughout California except the northwestern corner, montane forests, and high deserts (Small 1994). Loggerhead shrikes nest in small trees and shrubs in open country with short vegetation such as pastures, old orchards, mowed roadsides, cemeteries, golf courses, agricultural fields, riparian areas, and open woodlands (Yosef 1996). The nesting season extends from March through June. The trees on-site represent potential nesting habitat for loggerhead shrike.

Grasshopper Sparrow

The grasshopper sparrow (*Ammodramus savannarum*) is not listed pursuant to either the CESA or FESA, but it is designated as a species of special concern by the CDFW. The grasshopper sparrow is an uncommon and local, summer resident and breeder along the western edge of the Sierra Nevada and most coastal counties south to Baja California (where resident) (Small 1994). This species generally inhabits moderately open grasslands and prairies with patchy bare ground and scattered shrubs (Vickery 1996. Grasshopper sparrows are more likely to occupy large tracts of habitat than small fragments (Vickery 1996). Breeding generally occurs from early April to mid-July, with a peak in May and June.

Given the disturbed nature of the Helitack site, the annual grassland community within the site represents marginal nesting habitat for grasshopper sparrows.

Tricolored Blackbird

The tricolored blackbird (*Agelaius tricolor*) is not listed pursuant to either the CESA or FESA; however, it is designated as a species of special concern by the CDFW. This colonial nesting species is distributed widely throughout the Central Valley, Coast Range, and into Oregon, Washington, Nevada, and Baja California (Beedy and Hamilton 1999). Tricolored blackbirds nest in colonies that can range from several pairs to several thousand pairs, depending on prey availability, the presence of predators, or level of human disturbance. This nomadic species typically nests in emergent marsh, riparian thickets, and blackberry brambles, usually with some nearby standing water or ground saturation. Open grassland and agricultural fields are typical foraging areas, with nesting generally occurring from April through June. There is no suitable nesting habitat on-site for tricolored blackbirds.

Wintering Special-Status Birds

Several special-status birds may forage within the Property during the non-nesting season: ferruginous hawk (*Buteo regalis*), golden eagle (*Aquila chrysaetos*), and long-billed curlew (*Numenius americanus*). These species are typically not found in the Central Valley during the nesting season, however.

Ferruginous Hawk

Ferruginous hawk (*Buteo regalis*) is tracked by CNDDB but otherwise has no federal or state special status. This species typically occurs in open habitats and nests from Oregon into Canada, and nesting has been documented to occur in California only in Lassen County (Small 1994). For the remainder of the state, including the Central Valley, ferruginous hawk occurrences are restricted to the non-breeding season (September through April). Winter foraging occurs within a variety of open habitats including open grassland and oak savannah.

Golden Eagle

The golden eagle (*Aquila chrysaetos*) is designated as a bird of conservation concern by the USFWS but has no other federal special status. Additionally, golden eagles are fully protected according to the Fish and Game Code of California Section 3511. Golden eagles generally nest on cliff ledges and/or large lone trees in mostly rolling to mountainous terrain. Occurrences within the Central Valley floor are usually of post-breeding residents, non-breeding juveniles, or migrants. Foraging habitat includes open grassland and savannah.

Long-billed Curlew

Long-billed curlew (*Numenius americanus*) is designated as a bird of conservation concern by the USFWS but has no other federal special status. Long-billed curlew do not nest in California, but may occur within grassland and wetland habitats of the Central Valley during migration and winter.

4.7.5 Mammals

Special-status bats that have been documented within five miles of the site include silver-haired bat (*Lasionycteris noctivagans*), hoary bat (*Lasiurus cinerus*), Western red bat (*Lasiurus blossevillii*), and Western mastiff bat (*Eumops perotis californicus*). All have been reported from the Woodson Bridge

State Recreation Area. The silver-haired bat, hoary bat, and Western red-bat generally roost in trees, often in riparian areas. The Western mastiff bat is a species of cliff faces, exfoliating granite, ledges, and occasional abandoned structures. Habitats of these types are not present on-site.

4.7.6 Wildlife Movement/Corridors

The site is located adjacent to a busy highway, but within a generally undeveloped landscape with annual grassland (non-irrigated) used for livestock grazing. The annual grassland community in this region is an important resource for wintering raptors, and the nearby matrix of ephemeral wetlands and intermittent drainages likely support wildlife (e.g. waterfowl, waders, and shorebirds) movement during the wet season and less so during the dry summer/fall months. However, given the proximity of the site to Hwy 99 and the abundance of available open land for movement in the general area, the site is probably not part of a movement corridor for terrestrial species.

5.0 RECOMMENDATIONS

5.1 Waters of the U.S. and Vernal Pool Crustaceans

The off-site roadside improvement area supports 0.019 acre of potential Waters of the U.S. and marginal potential vernal pool crustacean habitat. The following mitigation measures are recommended to minimize potential impacts to Waters of the U.S.:

- An application for authorization to fill wetlands under the Section 404 of the federal Clean Water Act will be prepared and submitted to USACE.
- If mitigation is required for the fill of wetlands, mitigation may be obtained through the purchase of off-site credits or other means.

The following mitigation measures are recommended to minimize potential impacts to vernal pool crustaceans:

- The project may require consultation under Section 7 of the FESA which will be pursued concurrent with the submittal of the Section 404 application.
- Based on findings of this BRA and the 404 application, the USFWS may issue a Biological Opinion (BO), a document that states the opinion of USFWS as to whether or not an action by another federal agency (USACE) is likely to jeopardize the continued existence of a listed species (vernal pool fairy shrimp) or result in the destruction or adverse modification of critical habitat. The BO may also provide measures to contribute to the conservation of affected federally listed species.

5.2 Special-Status Plants

The Vina Helitack site supports limited potential habitat for adobe lily, which has low likelihood of occurring in the off-site Hwy 99 right-of-way. The following mitigation measures are recommended to minimize potential impacts to this plant:

- Perform focused plant surveys according to CNPS protocol. Surveys should be timed according to the blooming period for adobe lily (February – April) and a known reference population should be visited prior to surveys to confirm the species is blooming where known to occur.

- If adobe lily is found, avoidance zones may be established around plants to clearly demarcate areas for avoidance. Avoidance measures and buffer distances may be determined in coordination with CDFW.
- If adobe lily is found within the Project area and avoidance of the species is not possible, then additional measures such as seed collection and/or translocation may be developed in consultation with CDFW.
- If no special-status plants are found, no further measures pertaining to special-status plants are necessary.

5.3 Western Spadefoot

The Vina Helitack site supports potential foraging or refuge habitat for the Western spadefoot (CDFW species of special concern). The Lead Agency may require preconstruction surveys given the proximity to known populations.

- Perform preconstruction surveys within 14 days prior to the start of construction. If adult or juvenile spadefoots are found, relocate to nearby suitable habitat in consultation with CDFW.

5.4 Nesting Raptors

All raptors and their active nests are protected under the California Fish and Game Code and Federal MBTA. To ensure that there are no impacts to protected active nests, the following mitigation measures are recommended:

- Conduct a pre-construction nesting bird survey of all suitable habitats on the project within 14 days of the initiation of construction activity during the nesting season (February 1-August 31).
- If active nests are found, the active nests will be monitored for the first 24 hours prior to any construction-related activity to establish a behavioral baseline. A no-disturbance buffer around the nest shall be established. The buffer distance shall be established by a qualified biologist in accordance with CDFW's recommendations for buffer distances relative to the species identified. Once construction activities commence on-site, all nests will be monitored by a qualified biologist to detect any behavioral changes as a result of construction of the Proposed Project. If behavioral changes are observed that may result in adverse effects to the success of breeding, the work causing that change shall cease and consultation with CDFW shall be initiated to identify potential avoidance and minimization measures. Pre-construction raptor nesting surveys are not required for construction activity outside the nesting season.
- If no active raptor nests are found, no further measures pertaining to raptors nests are necessary.

5.5 Burrowing Owl

Burrowing owls (a federal species of concern and CDFW species of special concern) have potential to occur on-site. To minimize impacts to protected burrowing owls and their burrows, the following mitigation measures are recommended:

- If possible, initiate site construction activities during the non-breeding season, September 1 through January 31.

- Conduct a pre-construction burrowing owl survey within 14 days of the initiation of construction activity, according to the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). If no burrowing owls or sign are observed, construction may proceed.
- If burrowing owls or sign are found, implement avoidance setbacks according to CDFG (2012).
- If avoidance setbacks are infeasible, coordinate with CDFW to conduct passive relocation according to protocol outlined in the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). If passive relocation methods are employed, the project impact site should be rendered inhospitable for further burrowing owl re-occupation.

5.6 Loggerhead Shrike/Grasshopper Sparrow

The Vina Helitack project site supports marginal potential nesting habitat for two special-status passerine bird species, loggerhead shrike (a federal species of concern and CDFW species of special concern) and grasshopper sparrow (CDFW species of special concern). To ensure that there are no impacts to protected active nests, the following mitigation measures are recommended:

- Conduct a pre-construction nesting bird survey of all suitable habitats on the project within 14 days of the initiation of construction activity during the nesting season for the loggerhead shrike (generally February – July) and grasshopper sparrow (generally March - July).
- If active nests are found, the nests should be monitored prior to any construction-related activity to establish a behavioral baseline. A no-disturbance buffer around the nest shall be established. The buffer distance shall be established by a qualified biologist in consultation with CDFW. Once construction activities commence on-site, all nests will be monitored by a qualified biologist to detect any behavioral changes as a result of construction of the Proposed Project. If behavioral changes are observed that may result in adverse effects to the success of breeding, the work causing that change shall cease and consultation with CDFW shall be initiated to identify potential avoidance and minimization measures. Pre-construction bird nesting surveys are not required for construction activity outside the nesting season.
- If no active special-status bird nests are found, no further measures pertaining to special-status birds are necessary.

5.7 Birds Covered Under Migratory Bird Treaty Act

Many birds, including commonly occurring species such as mourning dove, Western meadowlark, and Northern mockingbird are protected under the Fish and Game Code and the Federal MBTA. A complete of birds protected can be found in 50 CFR 10.13. To ensure that there are no impacts to protected birds or their active nests, the following mitigation measures are recommended:

- Conduct a pre-construction nesting bird survey of all suitable habitats on the project within 14 days of the initiation of construction activity during the nesting season (February 1-August 31).
- If active nests are found, the active nests will be monitored prior to any construction-related activity to establish a behavioral baseline. A no-disturbance buffer around the nest shall be established. The buffer distance shall be established by a qualified biologist in consultation with CDFW. Once construction activities commence on-site, all nests will be monitored by a qualified biologist to detect any behavioral changes as a result of construction of the Proposed Project. If behavioral changes are observed that may result in adverse effects to the success of breeding, the work causing that change

shall cease and consultation with CDFW shall be initiated to identify potential avoidance and minimization measures. Pre-construction bird nesting surveys are not required for construction activity outside the nesting season.

- If no special-status birds are found, no further measures pertaining to special-status birds are necessary.

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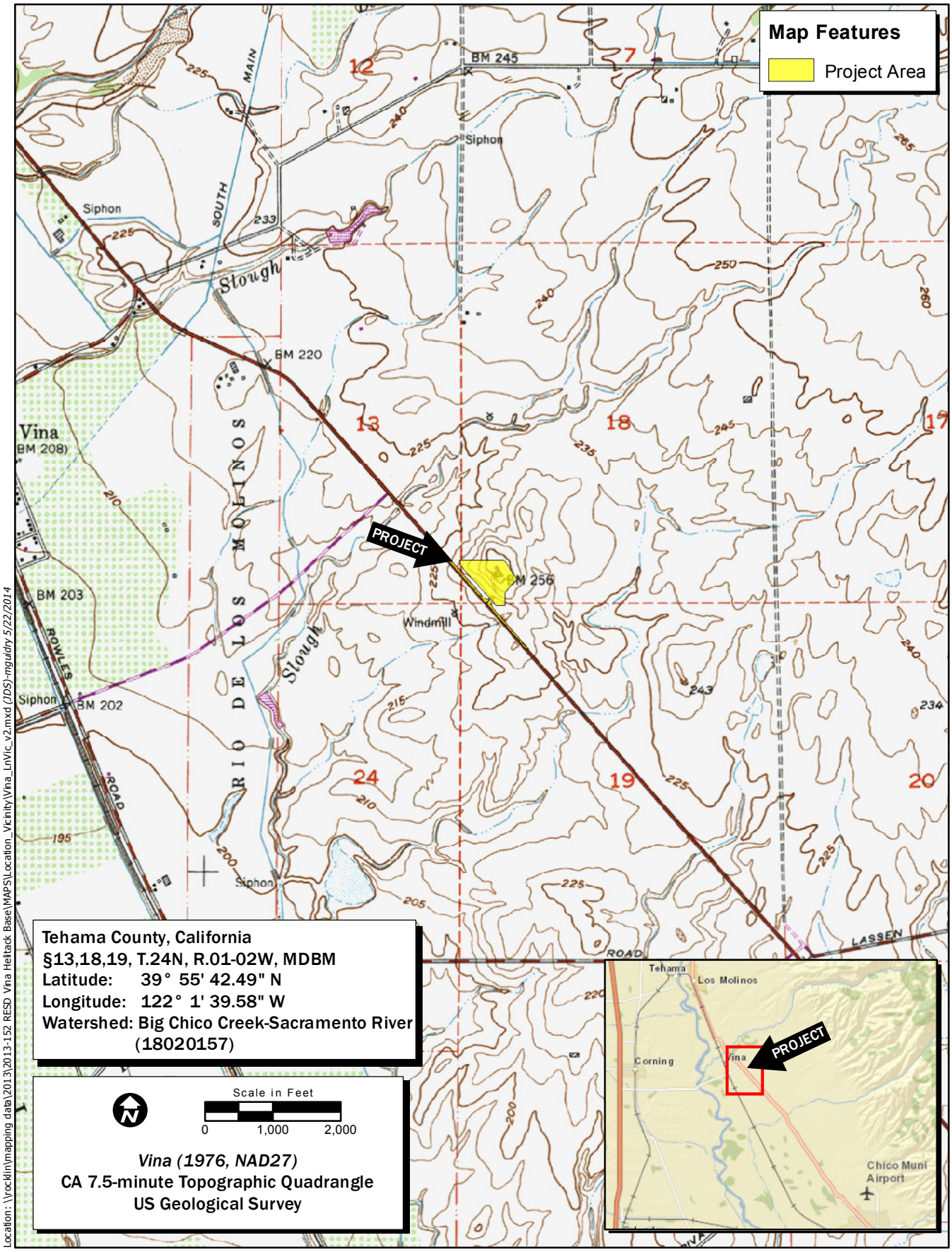
Figure 4. California Natural Diversity Database Occurrences of Special-Status Species



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Map Date: 4/30/2014
Service Layer Credits: ESRI World Street Map

Figure 1. Project Location and Vicinity

2013-152 RESD Vina Helitack base

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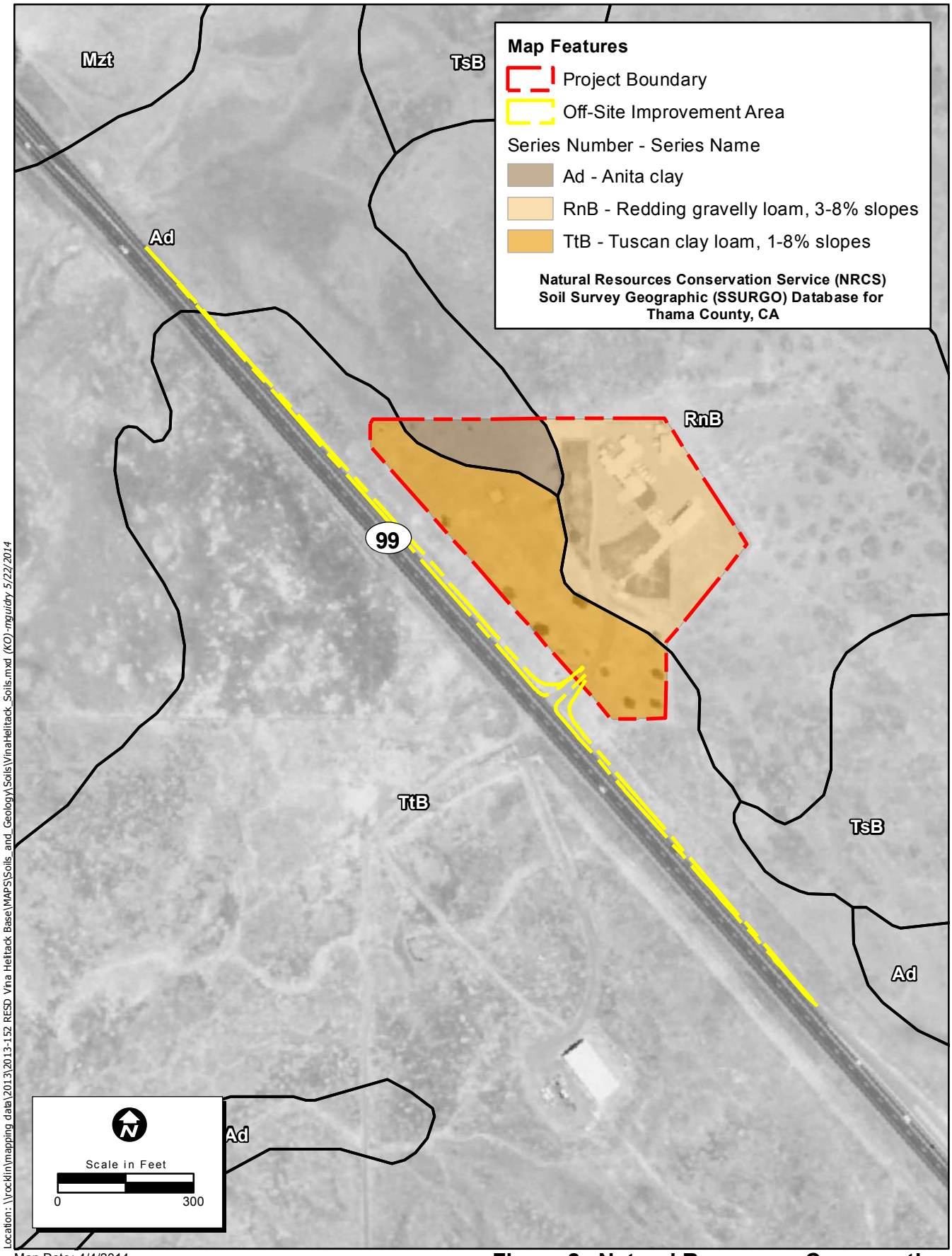

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Map Date: 4/4/2014
Photo Source: NAIP 2012

Figure 2. Natural Resources Conservation Service Soil Types

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2013-152 RESD Vina Helitack Base

Figure 3.
Draft Wetland Delineation

Map Features

- Helitack Base Boundary
- Road Improvements Boundary

Potential Waters

- Seasonal Wetland - 0.002 acres
- Ditch - 0.017 acres

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Location: N:\2013\2013-152_RESD_Vina_Helitack_Base\MAPS\Wetland_Mapping\Wetland_Delineation\v1\VinaHelitack_WD.mxd (KO)-KOrtega 5/23/2014

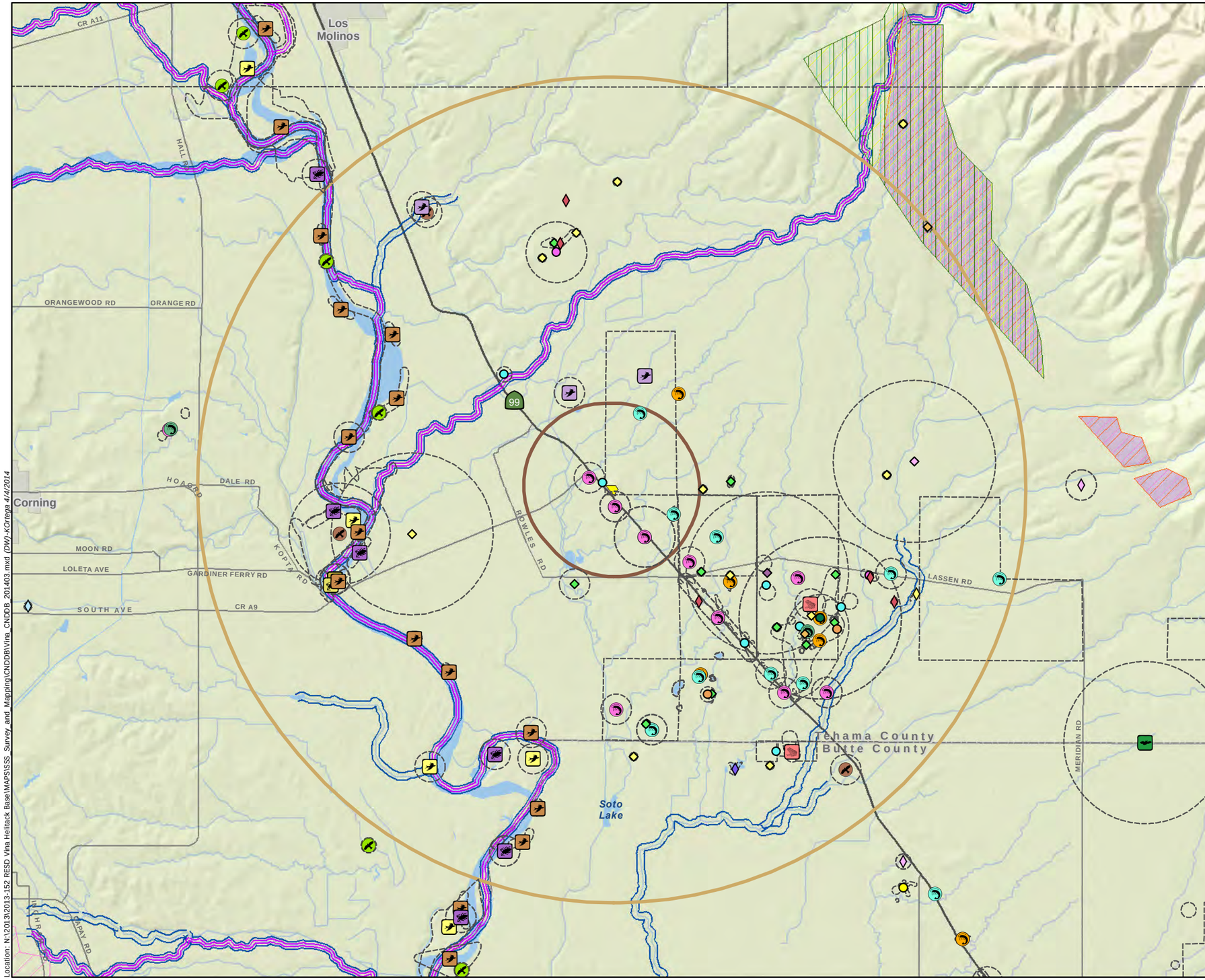
2013-152 RESD Vina Helitack Base

Scale in Feet
0 200

Photo Source: NAIP 2012

Map Date: 5/23/2014

Figure 4.
CNDDB Occurrences of Special-Status Species



Distance From Project

- 1 mile
- 5 miles

Boundaries

- Project Boundary [1]
- CNDDB Polygon Extent [2]

CNDDB Occurrences [2]

Plants

- Adobe-lily
- Ahart's Paronychia
- Boggs Lake Hedge-hyssop
- Butte County Meadowfoam
- Coulter's Goldfields
- Dwarf Downingia
- Greene's Tuctoria
- Hairy Orcutt Grass
- Hoover's Spurge
- Round-leaved Filaree
- Sanford's Arrowhead
- Silky Cryptantha
- Slender Orcutt Grass
- Stony Creek Spurge
- Woolly Meadowfoam

Amphibians/Reptiles

- Western Spadefoot

Fish

- Chinook Salmon -Spring-run Klamath-Trinity Rivers Pop.*

Invertebrates

- Conservancy Fairy Shrimp
- Vernal Pool Fairy Shrimp
- California Linderiella
- Vernal Pool Tadpole Shrimp
- Antoich Dunes Anthicid Beetle*
- Sacramento Anthicid Beetle
- Valley Elderberry Longhorn Beetle

Birds

- Swainson's Hawk
- Prairie Falcon*
- Osprey
- Western Yellow-billed Cuckoo
- Bank Swallow
- Tricolored Blackbird

Mammals

- Silver-haired Bat
- Hoary Bat
- Western Red Bat
- Western Mastiff Bat

Critical Habitat

- Greene's Tuctoria
- Hoover's Spurge
- Slender Orcutt Grass
- Hairy Orcutt Grass
- Conservancy Fairy Shrimp
- Vernal Pool Fairy Shrimp
- Vernal Pool Tadpole Shrimp
- Central Valley Steelhead
- Central Valley Spring-run Chinook

This map may include multiple species' occurrences at each location, some of which may not be visible on this graphic. The CNDDB occurrences shown may not reflect the actual location of the occurrence.

**** Species occurrence is represented solely by a polygon. The centroid point is not visible within the map extents.***

[1] Project Boundary: ECORP (APPROXIMATE)
[2] CDFW California Natural Diversity Database (CNDDB), Mar. 2014 Update (GIS Shapefile)
[3] USFWS Vernal Pool Species Final Critical Habitat (02/2006), and NOAA/NMFS Final Critical Habitat (06/2005).
CNDDB Occurrences Located on USGS 7.5' Quadrangles: Bend, Corning, Foster Island, Los Molinos, Nord Panther Spring, Richardson Springs NW, Vina.

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2013-152 RESD Vina Helitack Base

Miles
0 1 2

Map Date: 4/4/2014

ATTACHMENT A

Representative Site Photographs

Looking north into Vina Helitack survey area, showing convex topography with existing facilities at top of naturally occurring hill.

Looking northwest along roadside alignment at entrance driveway to the helitack facility. Inundated ditch occurs at roadside.

Looking into the survey area from the driveway showing small ornamental trees.

Looking northeast across property showing degraded and closely mowed annual grassland covering much of the survey area.

Looking east from same spot as above, toward helitack facilities. The convex topography of the site is apparent.

APPENDIX C

Cultural Resources Assessment

DRAFT

CONFIDENTIAL

Cultural Resources Inventory and Architectural History Evaluation Report Vina Helitack Base Project Tehama County, California

Prepared For:
California Department of Forestry and Fire Protection (CAL FIRE)
and
Department of General Services

Prepared By:
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ECORP Consulting, Inc.
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Under the Direction of Principal Investigator:
Katherine Knapp, MS, RPA

May 2014

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

MANAGEMENT SUMMARY

In November 2013, the State of California, Department of General Services (DGS) and California Department of Forestry and Fire Protection (CAL FIRE) retained ECORP Consulting, Inc. to conduct a cultural resources inventory and evaluation of the Vina Helitack Base (Base). CAL FIRE proposes to replace some existing facilities at the Vina Helitack Base, located near the town of Vina, Tehama County, California, to provide necessary fire protection needs to the local area and region.

The inventory and evaluation effort included a records search and literature review, focused archival research, and an intensive field survey. The records search results indicated that four previous cultural resources investigations and one previous archaeological overview have been conducted within 0.5 mile of the Project Area. As a part of one of those studies, the Control Station in the Vina Helitack Base, identified as site P-52-2064H, was previously recorded in 1991 and evaluated in 1993 by Thornton. The Control Station was evaluated as an historical resource, but the 1991 and 1993 records do not indicate that every building or structure within the Base was inventoried; only an architectural evaluation of the Control Station was completed. In addition, the original evaluation was conducted using a point numbering system, which only evaluated the fire lookout station under criteria A, B, and C and discussed integrity considerations but did not appropriately evaluate the property under criteria D. Therefore, the updated evaluation included a discussion of criteria D. One previously conducted archaeological inventory of approximately one acre was conducted around the areas of the Base now containing the helicopter hangar and moveable helipad. No other archaeological or historical resources have been previously recorded within the Project Area.

In order to update the previous evaluation of the Control Station at the Base and carry out a complete inventory of the entire property, an intensive pedestrian survey of the Project Area was conducted. An updated evaluation of the Control Station at the Base was completed using the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) eligibility criteria. The Control Station (P-52-2064H) was previously evaluated in 1993 as not eligible for inclusion on the NRHP or CRHR. As a result of the updated evaluation, the results have not changed and the site is still recommended not eligible. The updated evaluation also includes considerations for all ancillary features associated with the Control Station, which were not originally considered part of site P-52-2064H. No other archaeological or historical resources were found during the survey.

Recommendations for the management of unanticipated discoveries are also provided.

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1.0 INTRODUCTION

In November 2013, ECORP was retained by the State of California, Department of General Services (DGS), and the California Department of Forestry and Fire Protection (CAL FIRE) to conduct a cultural resources inventory and updated architectural evaluation of the Vina Helitack Base (Base) located near the town of Vina, Tehama County, California. CAL FIRE proposes to replace some existing facilities at the Base to provide necessary fire protection needs to the local area and region. A survey of the property was required to identify potentially eligible cultural resources (archaeological sites and historic buildings, structures, and objects) that could be affected by the Project, and an updated architectural evaluation of the architectural features on the Base was required.

1.1 Project Location

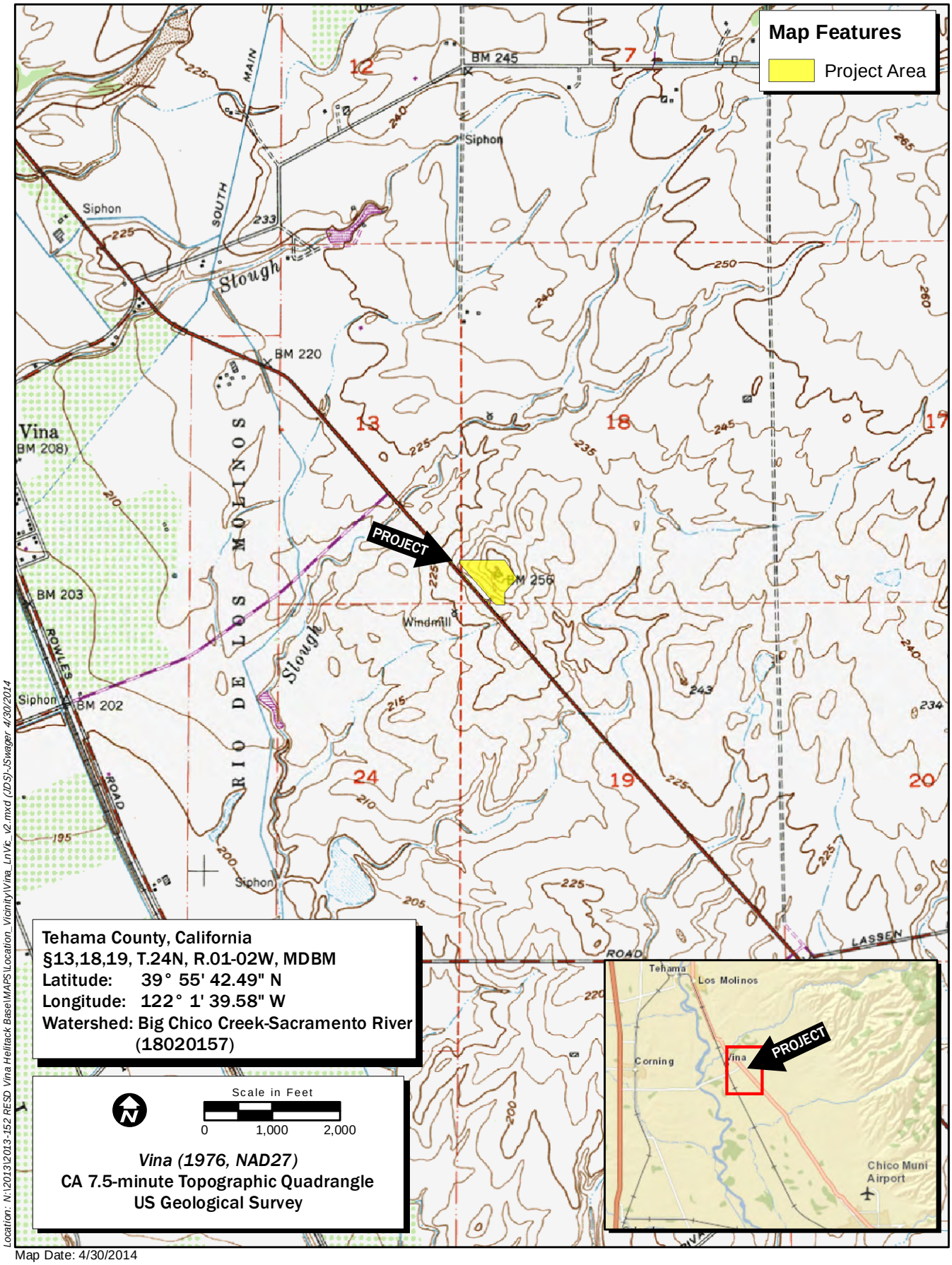
The Project Area consists of approximately 7.4 acres of property plus 0.25 mile along State Route 99 located near the town of Vina, in the southwestern quarter of the southwestern quarter Section 18 of Township 24 North, Range 1 West, Mount Diablo Base and Meridian as depicted on the 1976 Vina, California USGS 7.5' topographic quadrangle map (Figures 1, 2, and 3). The property is located adjacent to Highway 99 and is also known as Assessor Parcel Number (APN) 079-050-14-1.

1.2 Project Description

The Proposed Project would involve the replacement and expansion of the existing CAL FIRE Vina Helitack Base complex. The Project would include the demolition and new construction of several elements. The improvements on the site would include the following:

- 22-bed barracks building,
- three-bay apparatus building,
- generator/pump/storage building,
- five-blade helicopter hangar (to occur at a later date but is included as a part of this environmental analysis)
- re-constructed primary helipad and a new secondary helipad,
- relocated helicopter fueling infrastructure,
- training tower apparatus, and,

The new buildings would be designed to meet the State of California – DGS Tier 1 Energy and Sustainability lists. Tier 2 items would be considered in the design and implemented if cost effective. In addition, the buildings would be designed to meet the US Green Building Council's Leadership in Energy and Environmental Design (LEED) requirements to attain a Silver rating.



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Map Date: 4/30/2014
Service Layer Credits: ESRI World Street Map

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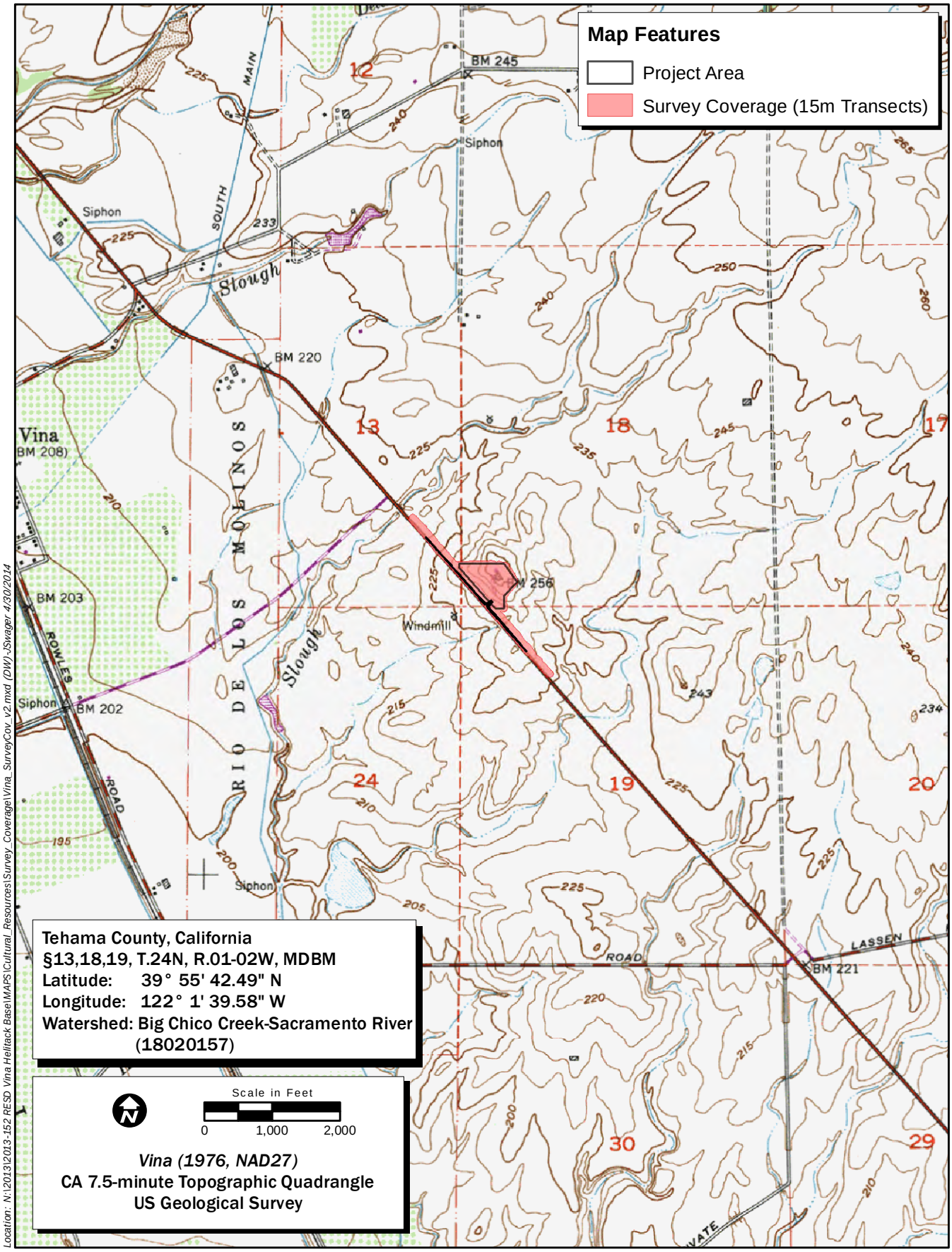
Figure 1. Project Location and Vicinity

2013-152 RESD Vina Helitack base



Location: N:\2013\2013-152 RESD Vina Helitack Base\MAPS\Cultural_Resources\Survey_Coverage\Vina_SurveyCov_v2.mxd (DW) JSwager 4/30/2014

Map Date: 4/30/2014

ECORP Consulting, Inc.
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Figure 2. Survey Coverage

2013-152 RESD Vina Helitack base

Location: N:\2013\2013-152 RESD Vina Helitack Base\MAPS\Cultural_Resources\Survey_Coverage\Vina_SurveyTran_v2.mxd (DW)-JSwager 4/30/2014

Map Date: 4/30/2014
Photo Source: World Imagery (ESRI Online, 2010 Image)

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ENVIRONMENTAL CONSULTANTS

Figure 3. Survey Transects

2013-152 RESD Vina Helitack base

In addition to the improvements described above, the Project would include the following additional components:

<u>On-site</u>

- Demolition of the existing barracks/administration building, demolition of the existing two-bay apparatus building, demolition of the existing storage building, demolition of the existing septic system. Perimeter and helicopter pad fence, remove jet fuel tank and pumps, helicopter pad, misc pavements, rock retaining wall, remove fuel vault and demo pad, demo utilities, demo propane tanks and service, and remove/demo one tree. Demolition of the existing helicopter hangar would occur at a later date but is included as part of this environmental analysis. See Representative Site Photos 3 and 4.
- Construction of new improvements consisting of site grading, paving for road and parking areas, water supply, storage and distribution systems, wastewater disposal systems, drainage systems, and erosion control measures.
- Construction of a new paved driveway/access way around the southern portion of the Project site.
- A new 60-foot-long by 6-foot-wide hose wash rack.
- Two new aboveground water storage tanks (10,000 gallon for domestic water use and 20,000 gallon for fire suppression) and concrete support slabs.
- Installations of a new +/-500-foot-deep domestic water supply well, well support improvements to include a new water filtration system, and domestic and fire water distribution systems.
- Two new 1,000-gallon propane tanks, concrete support pads, and underground gas distribution system.
- A new 12,000-gallon aboveground jet fuel tank, concrete support slab, and a fuel dispensing system.
- A new 2,000-gallon self-contained aboveground fuel tank with dispensing stations and concrete support slab. Tanks would be internally divided to provide 1,000 gallon diesel and 500 gallon gasoline.
- A new standard septic system consisting of an approximately 600 foot leach field, a 1,500 gallon septic tank (minimum), and a 600-foot, 6-inch gravity main.
- A new storm water collection system consisting of approximately 300 feet of a 12-inch underground storm drain; four drain inlets; 500-foot, 6-inch drain connecting building downspouts; and surface water swales to existing drainage systems.
- A drain system for the new wash rack including trench drain, oil/water separator, and diverter valve to connect to the septic system.
- A new 30-foot-tall radio tower and foundation.
- A new free-standing wood and steel framed training tower, complete with steel stairway, non-slip deck, railings, and an aircraft fuselage.
- New site lighting throughout, including helipad lighting, approach slope indicator lighting system, flag pole, and road identification sign lighting.
- New site landscaping and irrigation system.
- New fire sprinkler system in the existing helicopter hangar building.
- New perimeter fencing: approximately 2,000 feet of 6-foot-tall chain link fencing;

- New automatic gate, which controls access to the site.
- New flag pole with in-ground mounted light.
- New underground electrical and telephone distribution systems.
- New solar power system including photo-voltaic solar panels.
- New CAL FIRE station sign and platform.

Off-site

- Widening of Hwy 99 to allow for new left turn lane into Project site and right turn merging lane out of the Project site going south on Hwy 99. This would also involve the shifting of the existing travel lanes requiring the need for additional pavement and a new gravel shoulder on the north-bound side of the roadway (east side of the existing roadway).

1.3 Area of Potential Effects

The Area of Potential Effects (APE) consists of the horizontal and vertical limits of the Project, and includes the area within which significant impacts or adverse effects to Historical Resources or Historic Properties could occur as a result of the Project. The horizontal APE consists of all areas where activities associated with the Project are proposed, and in the case of the current project, equals the Project Area subject to environmental review under CEQA. This includes areas proposed for demolition, excavation, trenching, grading, paving, site improvements, staging, and other elements described in the official project description. The horizontal APE is illustrated in Figure 1 and also represents the survey coverage area illustrated in Figures 2 and 3. The APE measures approximately 7.4 acres plus up to 0.25 mile of road improvements to State Route 99 right-of-way, as described in Section 1.2, above.

The vertical APE is described as the maximum depth below the surface to which excavations for project foundations and facilities will extend. Thus, the vertical APE includes all subsurface areas where archaeological deposits could be affected. The subsurface vertical APE varies across the project, depending on where digging, grading, paving, and other ground-disturbing activities are occurring. For this Project, ground disturbance of up to approximately 500 feet below the surface for deep water supply wells and the water filtration system will be necessary and approximately 2 to 15 feet in order to install new infrastructure and domestic and fire water distribution systems as described on the official site work description provided by DGS.

The vertical APE also is described as the maximum height of new facilities, which could impact the physical integrity and integrity of setting of cultural resources, including districts and traditional cultural properties. For the current project, the above-surface vertical APE is up to approximately 50 feet above the surface, which is the maximum height of the proposed new facility buildings within the Base complex.

1.4 Regulatory Context

To meet the regulatory requirements of this project, this cultural resources investigation was conducted pursuant to the provisions for the treatment of cultural resources contained within CEQA (Pub. Res. Code § 21000 et seq.). The goal of CEQA is to develop and maintain a high-quality environment that serves to identify the significant environmental effects of the actions of a proposed project and to either avoid or mitigate those significant effects where feasible. CEQA pertains to all proposed projects that require state or local government agency approval, including the enactment of zoning ordinances, the issuance of conditional use permits, and the approval of development project maps.

CEQA (Title 14, CCR, Article 5, Section 15064.5) applies to cultural resources of the historical and prehistoric periods. Any project with an effect that may cause a substantial adverse change in the significance of a cultural resource, either directly or indirectly, is a project that may have a significant

impact on the environment. As a result, such a project would require avoidance or mitigation of impacts to those affected resources. Significant cultural resources must meet at least one of four criteria that define eligibility for listing on either the California Register of Historical Resources (CRHR) (Pub. Res. Code § 5024.1, Title 14 CCR, Section 4852) or the National Register of Historic Places (NRHP) (36 CFR 60.4). Cultural resources eligible for listing on the NRHP are considered Historic Properties under 36 CFR Part 800 and are automatically eligible for the CRHR. Resources listed on or eligible for inclusion in the CRHR are considered Historical Resources under CEQA.

The improvements to the State Route 99 right-of-way, required to accommodate new turn lanes, will require an encroachment permit from Caltrans District 3. Issuance of an encroachment permit for this project does not trigger compliance with the *First Amended Programmatic Agreement among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California*. Caltrans staff will review this technical report for compliance with the encroachment permit requirements, however.

1.5 Report Organization

The following report documents the study and its findings and was prepared in conformance with the California Office of Historic Preservation's *Archaeological Resource Management Reports: Recommended Contents and Format.* Attachment A includes a confirmation of the records search with the California Historical Resources Information System (CHRIS) and the letter sent to the Tehama County Historical Society. Attachment B contains documentation of Native American and Historical Society coordination. Attachment C presents photographs of the Project Area, and Attachment D contains confidential cultural resource site locations and DPR 523 records.

Sections 6253, 6254, and 6254.10 of the California Code authorize state agencies to exclude archaeological site information from public disclosure under the Public Records Act. In addition, the California Public Records Act (Government Code §6250 *et seq*.) and California's open meeting laws (The Brown Act, Government Code §54950 *et seq*.) protect the confidentiality of Native American cultural place information. Under Exemption 3 of the federal Freedom of Information Act (5 USC 5), because the disclosure of cultural resources location information on federal lands is prohibited by the Archaeological Resources Protection Act of 1979 (16 USC 470hh) and Section 304 of the NRHP, it is also exempted from disclosure under the Freedom of Information Act.

Likewise, the Information Centers of the CHRIS maintained by the Office of Historic Preservation (OHP) prohibit public dissemination of records search information. In compliance with these requirements, the results of this cultural resource investigation were prepared as a confidential document, which is not intended for public distribution in either paper or electronic format.

2.0 SETTING

2.1 Environmental Setting

The Project Area is located along the eastern end of the Sacramento River floodplain in the northern portion of the Sacramento Valley. The Project Area is located on a low hill, with elevations ranging between 235 and 260 feet above mean sea level (AMSL). The lands east and south of the Project Area contain overgrown grassland used for grazing, while the lands to the north and west of the Project Area contain row crops and orchards.

2.2 Geology and Soils

Three soil types are identified within the Project Area. The majority of the Project Area (52 percent) consists of Tuscan clay loam, 1 to 8 percent slopes, 39 percent consists of Redding gravelly loam, 3 to 8 percent slopes, and 9 percent consists of Anita clay. Tuscan clay loam is a well-drained alluvium derived from volcanic rock along terraces at elevations ranging from 200 to 1,000 feet AMSL. Redding gravelly loam is a moderately well drained alluvium derived from metamorphic and sedimentary rock found along terraces at elevations ranging from 100 to 1,500 feet AMSL. Anita clay is a somewhat poorly drained alluvium derived from volcanic rock found along basin floors at elevations ranging from 150 to 1,500 feet AMSL (USDA 2013).

2.3 Vegetation and Wildlife

The plant community within the Project Area includes annual grassland that is dominated by non-native grassland species including wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), and ryegrass (*Lolium* sp.). Other plant species may include yellow star-thistle (*Centaurea solstitialis*), tarweed (*Holocarpha virgata*), foxtail barley (*Hordeum murinum*), prickly lettuce (*Lactuca serriola*), and hairy hawkbit (*Leontodon taraxacoides*).

Wildlife in the Project Area could include black-tailed jackrabbit, (*Lepus californicus*), rabbit (*Sylviligus* sp.), gray squirrel (*Sciurus griseus*), coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), red-tailed hawks (*Buteo jamaicensis*), prairie falcons (*Falco mexicanus*), burrowing owls (*Speotyto cunicularia*), California quail (*Callipepla californica*), mourning doves (*Zenaidura macroura*), California jays (*Aphelocoma coerulescens*), Rattlesnakes (*Crotalus viridus*) and various frogs (*Rana* sp.), toads (*Bufo* sp.), and lizards (*Sceloperus* sp.).

3.0 CULTURAL CONTEXT

3.1 Prehistory

It is generally believed that human occupation of California began at least 10,000 years before present (BP). The archaeological record indicates that between approximately 10,000 and 8000 BP, a predominantly hunting economy existed, characterized by archaeological sites containing numerous projectile points and butchered large animal bones. Animals that were hunted probably consisted mostly of large species still alive today. Bones of extinct species have been found, but cannot definitely be associated with human artifacts. Although small animal bones and plant grinding tools are rarely found within archaeological sites of this period, small game and floral foods were probably exploited on a limited basis. A lack of deep cultural deposits from this period suggests that groups included only small numbers of individuals who did not often stay in one place for extended periods (Wallace 1978).

Around 8000 BP, there was a shift in focus from hunting towards a greater reliance on plant resources. Archaeological evidence of this trend consists of a much greater number of milling tools (e.g., metates and manos) for processing seeds and other vegetable matter. This period, which extended until around 5000 BP, is sometimes referred to as the “Millingstone Horizon” (Wallace 1978). Projectile points are found in archaeological sites from this period, but they are far fewer in number than from sites dating to before 8000 BP. An increase in the size of groups and the stability of settlements is indicated by deep, extensive middens at some sites from this period (Wallace 1978).

In sites dating to after about 5000 BP, archaeological evidence indicates that reliance on both plant gathering and hunting continued as in the previous period, with more specialized adaptation to particular environments. Mortars and pestles were added to metates and manos for grinding seeds and other vegetable material. Flaked-stone tools became more refined and specialized, and bone tools were more

common. During this period, new peoples from the Great Basin began entering southern California. These immigrants, who spoke a language of the Uto-Aztecan linguistic stock, seem to have displaced or absorbed the earlier population of Hokan-speaking peoples. During this period, known as the "Late Horizon," population densities were higher than before and settlement became concentrated in villages and communities along the coast and interior valleys (Erlandson 1994; McCawley 1996). Regional subcultures also started to develop, each with its own geographical territory and language or dialect (Kroeber 1925; McCawley 1996; Moratto 1984). These were most likely the basis for the groups encountered by the first Europeans during the 18th century (Wallace 1978). Despite the regional differences, many material culture traits were shared among groups, indicating a great deal of interaction (Erlandson 1994). The introduction of the bow and arrow into the region sometime around 2000 BP is indicated by the presence of small projectile points (Wallace 1978; Moratto 1984).

3.2 Local Prehistory

Archaeological investigations associated with reservoir projects generated regional archaeological chronologies, which can be applied to the current Project Area. These include work at Black Butte Reservoir (Mohr and Fredrickson 1949), followed by salvage excavation work at Red Bank Creek (Treganza 1954), work at the Tehama-Colusa Canal (Treganza et al. 1965), the proposed Paskenta-Newville Reservoir (Chartkoff and Childress 1966), additional work at Black Butte Reservoir (Treganza and Heiksen 1969), and survey work for the proposed Dutch Gulch Reservoir (Leonard 1969). In the 1970s, survey and excavation work continued with investigations along Thomes Creek (Edwards 1970) and surveys for Tehama and Dutch Gulch Reservoirs (Jensen 1978). Archaeological work related to reservoir construction continued into the 1980s, with additional investigations focusing on the Thomes-Newville Reservoir (Bard et al. 1983) and a succession of projects at Black Butte, Dutch Gulch, and Tehama Reservoirs conducted by California State University, Sacramento under Jerald Jenson (Dondero and Johnson 1988; Johnson and Theodoratus 1984a, 1984b; Johnson et al. 1984, Johnson 1990, Johnson and Dondero 1990). According to Hamusek (1991), the 1965 archaeological investigations by Treganza, Edwards, and King near the Tehama-Colusa Canal, 1966 investigations by Childress and Chartkoff (1966), the 1978 Cottonwood Creek investigations by Jensen (1978) and Johnson and Theodoratus (1982) all resulted in the discovery of a large number of archaeological sites, with some containing artifacts and burials clearly indicative of a late prehistoric Nomlaki and Wintu presence.

Edwards (1970) developed a three-phase prehistoric cultural chronology for northern California that begins with early occupations dominated by the use of millingstones and locally available stone materials (basal and chert), which encompasses a time span of about 5,000 years. The phases consist of the following: the Northern Millingstone Phase (5000 to 2000 BP), the Tehama Phase (2000 to 1000 BP), and the Shasta Complex (1000 BP to historic period) (Edwards 1970, Hamusek 1991). The Tehama Phase represented an increased reliance on acorns, reflected by the addition of mortars and pestles to the tool kit. The late prehistoric Shasta Complex was poorly represented in Edward's data. As a result, he constructed this phase by using archaeological data from the Shasta Dam area (Treganza 1952; Smith and Weymouth 1952; Meighan 1955). The Shasta Complex was studied more intensively during subsequent archaeological investigations by Jensen and Reed (1979) and Sundahl (1982).

Sundahl's (1982) work on the Shasta Complex represents the first comprehensive attempt to explain its origin. Based on the analysis of data from excavated sites in the Redding area and Whistler's (1977) linguistic evidence, Sundahl concluded that the complete trait list associated with the Shasta Complex was restricted to the ethnographic Wintu territory. Therefore, the Shasta Complex most likely represented the Wintu migration into the upper Sacramento River Valley.

Sundahl (1982) divided the Shasta Complex into three temporal phases based on the presence and absence of distinguishing attributes: Shasta Complex Phase I: 1250-750 BP, Phase II: 750-350 BP, and Phase III: 450-100 BP. Additional work by Sundahl and Clewett (1982a and 1982b) argued for a distinction between permanent, riverine villages of the Wintu represented by the Shasta Complex sites

west of the Sacramento River and contemporaneous late period sites representing seasonal occupation of the mobile foraging Yana along the east banks of the Sacramento River and eastern foothills of the Sacramento Valley. This mobile/foraging late period manifestation is identified as the Tehama Pattern. Milling equipment was among the traits that distinguished between the Shasta Complex (with emphasis on mortars and pestles and absence of manos and milling stones) and the Tehama Pattern, which relied on manos and milling stones with an absence of mortars and pestles.

In 1993, Sundahl updated her original assumption of three temporal phases to include four based on the excavation of three sites in the Bend area of Tehama County. Her model now proposed specific artifact assemblages that represent each phase, which in turn represent distinctly different adaptive strategies. Phase I (2500 to 1500 BP) is characterized by large corner-notched and leaf-shaped projectile points. Phase II (1500-800 BP) is characterized by small corner-notched projectile points, hand stones, milling stones, hopper mortars, pestles, notched-pebbles net weights, and large numbers of cores, cobble tools, and edge-modified flakes of metavolcanic or basaltic material. Finally, Phase III (beginning around 800 BP) is characterized by the addition of Gunther Series projectile points to the Phase II artifact assemblage. Sundahl suggested, but did not characterize, a Phase IV (Sundahl 1993).

Ultimately, Sundahl characterizes the four-phase sequence in terms of subsistence-settlement patterns, adaptive strategies, and population movements. She suggests that the Phase I pattern may represent the ancestral Yana or other Hokan-speaking groups that occupied sporadic encampments along the east bank of the Sacramento River, with subsistence focusing on the exploitation of terrestrial fauna. However, Sundahl does not speculate on population movement or adaptive strategies for Phases II or IV, but she does suggest that Phase III reflects increased interactions between the Wintu and Yana populations (Sundahl 1993).

3.3 Ethnography

Ethnographically, the Project Area lies along the boundaries of several traditional territories, including the River Nomlaki, Yana, and Konkow. Like most prehistoric populations, tribal boundaries were not static, but rather, were elastic and constantly changing in part as a reflection of resource exploitation patterns (Nilsson 1985) or changes in socio-political relationships between groups. Therefore, any of these groups may have had a presence inside the Project Area. A brief summary of each is provided below; additional ethnographies are provided in Heizer (1978).

3.3.1 River Nomlaki

According to tribal territory maps, the Nomlaki were divided into two groups: the Hill Nomlaki, whose territory consisted of present day Tehama and northern Glenn Counties along the Coast Range foothills, and the River Nomlaki, whose territory consisted of the creeks along the Sacramento River spanning from present day Cottonwood to the north, down to Vina in the south. The Project Area is located in what may have been the southeastern corner of the River Nomlaki. Adjacent to the Project Area were the ancestral territory of the Yana to the east, and Konkow to the south. Little information has been obtained regarding the River Nomlaki; however, Hill Nomlaki experts described the River Nomlaki as consisting of two groups, the “water north language” identified as *memwaylaka* and the “easterners” identified as *puymok. The puymok* most likely occupied the land in the vicinity of the Project Area (Goldschmidt 1978).

Little evidence is provided in the archaeological record for the Nomlaki; however, studies on neighboring tribes to the south, suggest that the Nomlaki may have been part of the latter end of a developmental sequence characterized with flexed burials containing offerings of clamshell disk beds, bird-bone whistles, stone pipes, and other funerary gifts signifying wealth (Goldschmidt 1978).

The social structure of the Nomlaki was believed to consist of villages ranging from 25 to 200 people where a central chieftain or *cabatu* was the hereditary male leader of the village. This chieftain’s role was

to listen and resolve disputes and act as an overall legal authority and leader over the villagers. The exogamous family unit was kinship-based (related in the male line), with males who married-in wives with similar names. Every immediate family (husband, wife, and children) produced and consumed food on their own, but were known to share resources with other families within the village (Goldschmidt 1978). The village layout typically contained the chieftain's house in the center, with the villager's dwellings surrounding and opening towards the chieftain's house. The villages also included a menstrual hut, which was located furthest away from any nearby water sources, and a dance house located outside of the center of the village, away from the chieftain's house (Goldschmidt 1978).

The Nomlaki lived on a hunting and gathering diet consisting of acorns, seeds, tubers, deer, elk, rabbit, birds, fish, and other small game. Hunting was performed both individually and as a group. The primary tool for hunting medium- to large-sized game was the bow and arrow; however, nets of various size were used to capture deer, rabbits, and fish (Goldschmidt 1978).

3.3.2 Yana

The Yana, a Hokan-language-speaking group, inhabited the upper Sacramento River valley and foothills east of the Sacramento River and south of the Pit River and north of Pine and Rock Creeks (primarily along the Deer Creek drainage); the crest of the southern Cascades passing through Lassen Peak formed the eastern boundary. Their numbers probably never exceeded 2,000 individuals. (West and Welch 2000).

Much of what is known about Yana culture was provided by Ishi, a Yahi Yana, who was brought to the University of California in 1911 after his family group died and he was left alone to survive. Yana territory was divided among numerous tribelets, each consisting of a major village with a principal chief and assembly house and several allied villages. The chief's position was hereditary, but the chief's authority was limited to making suggestions, without the power of control or command. The chief's status within the community obtained certain favors, however. For instance, the chief did not have to hunt and was provided with other presents as well (Johnson 1978). The southern Yana and Yahi lived in single-family dwellings, which consisted of a shallow, oval depression 10 to 12 feet in diameter. The exterior structure was conical in shape and consisted of a covering of slabs of bark supported by a framework of poles. (Johnson 1978).

Yana subsistence procurement consisted of the gathering of a wide variety of resources. They consumed a variety of plant foods, including acorns, berries, seeds, roots, tubers, and bulbs. The acorn, harvested in September and October, was the most important of all resources. Of the various game animals hunted, deer were the most important. Deer usually were hunted by individual hunters, as were rabbits and quail. In addition to these animals, rodents and some insects were a part of the Yana diet, as were fish such as salmon, trout, and suckers. (Johnson 1978).

Relations between the Yana and their neighbors were seldom cordial. The Maidu considered them enemies, as did the Wintu and Achumawi. Despite the enmity, however, some trade did take place between the Yana and their adjacent neighbors. Goods acquired by the Yana included obsidian, arrows, quivers, buckskin, woodpecker scalps, clamshell disk beads, magnesite cylinders, dentalium shells and arrow points. In trade, the Yana supplied fire drills, deer hides, dentalia, salt, buckskin and baskets. (Johnson 1978).

The Yana suffered severely during the period of Anglo-American contact. In 1844, Mexican land grants to Peter Lassen and Job F. Dye were established along the eastern side of the valley and extended into the foothills occupied by the southern and Yahi Yana. Daniel Sill settled on part of the Lassen grant in 1846 (Johnson 1978). The first major hostility took place when Capt. John Fremont attacked a peaceful gathering of Native Americans on Bloody Island (at the mouth of Battle Creek) in the Sacramento River. The village supposedly belonged to the Yana (Johnson 1978). This initial conflict marked the beginning

of the end for the Yana. Johnson estimates that in approximately 20 years, their numbers were reduced from 1,900 individuals to fewer than 100. Today, while a few individuals claim Yana ancestry, there are no federally recognized Yana tribes.

3.3.3 Konkow

The Konkow, or Northwestern Maidu, occupied the Northern Sacramento Valley and surrounding foothills of the Sierra Nevada range. The Maidu, on the basis of cultural and linguistic differences, have been differentiated into three major related divisions: the Northeastern (Mountain Maidu), Northwestern (Konkow), and Southern (Nisenan) (Dixon 1905; Kroeber 1925).

Powers (1877), Dixon (1905), and Kroeber (1925) have provided the earliest documentation of the Maidu and Konkow, and their thorough observations have depicted the life and culture of these related groups. Additional ethnographic descriptions for the Maidu and Konkow can be found in Riddell (1978), Hill (1970), and Kowta (1988), among others. An in-depth description of Maiduan material culture and resource exploitation has been included in Johnson and Theodoratus (1978). Because the Maidu and Konkow are believed to have been so closely related, ethnographers tended to group them as one.

The Konkow occupied territory immediately to the southwest of the Mountain Maidu, along the Feather and Sacramento Rivers to their southern boundary at the Sutter Buttes. The Konkow were primarily located in the lower elevations of the Sierra Nevada and along the valley floor (Riddell 1978). Tribal territories adjacent to the Maidu and Konkow included the Atsugewi and Yana to the north, the Nomlaki and Patwin to the west, the Paiute and Washo to the east, and the Nisenan to the south (Heizer 1978).

Settlement patterns of the Maidu and Konkow were seasonal in nature. The Konkow inhabited a savanna-like habitat on the valley floor and in the lower elevations of the Sierra foothills during the winters. Resources exploited in this environment include wild rye, pine nuts, acorns, fish, and invertebrates (Kroeber 1925; Riddell 1978). Summers in the mountains gave them access to deer meat, skins, and other items for food, clothing, and shelter for the winter months.

The village community, the primary settlement type among the Maidu-Konkow, consisted of three to five small villages, each composed of about 35 members. Among the mountain Maidu, village communities were well-defined, and based on geography. In contrast, the Konkow were dispersed throughout the valley floor along river canyons, and as a result, village communities were less concentrated or definable (Kroeber 1925). In terms of permanent occupation sites, both groups preferred slightly elevated locations that provided visibility of the surrounding area and were away from the water-laden marshes and meadows (Riddell and Pritchard 1971; Dixon 1905; Riddell 1978). The Mechoopda Village, formerly located near downtown Chico, was home to many Maidu well into historical times.

Among the villages, the male occupant of the largest *kum*, or semi-subterranean earth-covered lodge, governed the community (Riddell 1978; Kroeber 1925; Dixon 1905). Two other types of ethnographically documented structures in use included the winter-occupied conical bark structure and the summer shade shelter (Riddell 1978).

Clothing, accessories and other personal items were manufactured using elaborate basket weaving techniques, shell and bone ornamenting, and by incorporating feathers, game skins, plant roots, and stems into objects (Riddell 1978). Shell, in the form of beads for currency or as valuable jewelry, was very desirable and was exchanged for food, obsidian, tobacco, and pigments (Kroeber 1925; Riddell 1978).

3.4 Regional History

The first European to visit California was Spanish maritime explorer Juan Rodriguez Cabrillo in 1542. Cabrillo was sent north by the Viceroy of New Spain (Mexico) to look for the Northwest Passage. Cabrillo visited San Diego Bay, Catalina Island, San Pedro Bay, and the northern Channel Islands. The English adventurer Francis Drake visited the Miwok Native American group at Drake's Bay or Bodega Bay in 1579. Sebastian Vizcaíno explored the coast as far north as Monterey in 1602. He reported that Monterey was an excellent location for a port (Castillo 1978).

Colonization of California began with the Spanish Portolá land expedition. The expedition, led by Captain Gaspar de Portolá of the Spanish army and Father Junipero Serra, a Franciscan missionary, explored the California coast from San Diego to the Monterey Bay Area in 1769. As a result of this expedition, Spanish missions to convert the native population, presidios (forts), and pueblos (towns) were established. The Franciscan missionary friars established 21 missions in Alta California (the area north of Baja California) beginning with Mission San Diego in 1769 and ending with the mission in Sonoma established in 1823. The purpose of the missions and presidios was to establish Spanish economic, military, political, and religious control over the Alta California territory. The nearest missions were in the vicinity of San Francisco Bay and included Mission San Francisco de Asis (Dolores) established in 1776 on the San Francisco peninsula, Mission Santa Clara de Asis at the south end of San Francisco Bay in 1777, Mission San Jose in 1797, Mission San Rafael, established as an *asistencia* in 1817 and a full mission in 1823, and Mission San Francisco Solano in Sonoma in 1823 (Castillo 1978; California Missions Online n.d.). Presidios were established at San Francisco and Monterey. The Spanish took little interest in the area and did not establish any missions or settlements in the Central Valley.

After Mexico became independent from Spain in 1821, what is now California became the Mexican province of Alta California with its capital at Monterey. In 1827, American trapper Jedediah Smith traveled along the Sacramento River and into the San Joaquin Valley to meet other trappers of his company who were camped there, but no permanent settlements were established by the fur trappers (Thompson and West 1880).

The Mexican government closed the missions in the 1830s and former mission lands, as well as previously unoccupied areas, were granted to retired soldiers and other Mexican citizens for use as cattle ranches. Much of the land along the coast and in the interior valleys became part of Mexican land grants or "ranchos" (Robinson 1948). During the Mexican period there were small towns at San Francisco (then known as Yerba Buena) and Monterey. The rancho owners lived in one of the towns or in an adobe house on the rancho. The Mexican Period includes the years 1821 to 1848.

John Sutter, a European immigrant, built a fort at the confluence of the Sacramento and American Rivers in 1839 and petitioned the Mexican governor of Alta California for a land grant, which he received in 1841. Sutter built a flour mill and grew wheat near the fort (Bidwell 1971). Gold was discovered in the flume of Sutter's lumber mill at Coloma on the South Fork of the American River in January 1848 (Marshall 1971). The discovery of gold initiated the 1849 California Gold Rush, which brought thousands of miners and settlers to the Sierra foothills east and southeast of Sacramento.

The American period began when the Treaty of Guadalupe Hidalgo was signed between Mexico and the United States in 1848. As a result of the treaty, Alta California became part of the United States as the territory of California. Rapid population increase occasioned by the Gold Rush of 1849 allowed California to become a state in 1850. Most Mexican land grants were confirmed to the grantees by U.S. courts, but usually with more restricted boundaries, which were surveyed by the U.S. Surveyor General's office. Land outside the land grants became federal public land, which was surveyed into sections, quarter-sections, and quarter-quarter sections. The federal public land could be purchased at a low fixed price per acre or could be obtained through homesteading (after 1862) (Robinson 1948).

3.5 Project Area History

The Project Area is located 1.4 miles east of the town of Vina, a rural community surrounded by agriculture and farmland north of Chico and east of Corning, in Tehama County, California. The Sacramento River is located two miles west of Vina, Deer Creek is approximately 0.5 mile north, and the Sierra Nevada Range is approximately eight miles east of the town. Deer Creek Canyon, located east of Vina, was once the home of the Yahi Native American people. Ishi, commonly known as the last survivor of the Yahi, is commemorated by a plaque located in the town. The original meaning of the word "Tehama" is unknown, but it is most commonly believed to be a Native American word meaning "low land" or "high water," because of the frequent flooding of the region. Tehama may also have been named for the Nomlaki village, *Tehemet*, which was located near the confluence of the Sacramento River and Elder Creek (Kyle 2002; Goldschmidt 1978).

Peter Lassen was a Danish blacksmith who immigrated to America in 1829. Lassen worked at Sutter's Fort from 1842 through 1843 and, with help from his connection with John Sutter, he became a Mexican citizen in 1844. Lassen was then granted, by then Mexican Governor Micheltorena, his Rancho Bosquejo, a 26,000-acre tract of prime farmland, which included the area now containing the town of Vina. By 1846, Lassen had established a vineyard on the land and planted Mission grapevines. In 1847, he established Benton City, named for Missouri Senator Thomas H. Benton, on his Rancho and traveled to Missouri to encourage farmers to move west and tend his large cotton and wheat fields. A year later, gold was discovered in Coloma, and because of this, people abandoned Benton City, which did not survive the Gold Rush. A monument marks the site of the City on the east side of Highway 99, and just north of Deer Creek (Kyle 2002).

By 1852, Lassen had subdivided and sold parcels of his Rancho, including an entire league of his land to trapper Daniel Sill. Lassen then sold his remaining land to Henry Gerke, who extended and improved Lassen's vineyards, and operated a successful winery for the next 30 years. During this time, Gerke laid out the town now known as Vina (Abbey of New Clairvaux 2013). A third class post office was established in Vina on April 4, 1871, and Samuel C. Dicus was the first postmaster (Southwest Shasta Historical Group 2013). A United States Post Office was established there in 1880 (Abbey of New Clairvaux 2013).

Leland Stanford purchased 9,000 acres of Lassen's original grant land from Gerke in 1881, and established his Vina Ranch. Gerke's town was then named Vina after Stanford's vineyard (viña is the Spanish word for vineyard). Stanford purchased thousands of acres surrounding his ranch and, by 1855, Vina ranch had expanded to 55,000 acres. In 1890, Stanford's Great Vina Ranch was recognized as the world's largest vineyard, winery, and distillery. Stanford grew more than a thousand acres of vines, and built a large irrigation network of dams, canals, and ditches designed to irrigate the vast expanse of land. Stanford also constructed a winery, a storage cellar with a two-million-gallon capacity, a brandy distillery, and warehouses. Most of the Vina Ranch wine was sold to New York markets (Abbey of New Clairvaux 2013).

Stanford employed many French wine growers who lived in barracks on his ranch. The majority of his laborers, however, were Chinese and Japanese immigrants. Between 1870 and 1890 there were 167 Chinese living in Vina, working on either the Cone Ranch or for Stanford. Many were employed in Stanford's vineyards tending vines, picking and packing grapes and working in the winery. There was a Chinese store on Stanford's property, which sold groceries, clothing, medicine and "Chinese goods." The Chinese lived on the north end of Vina, along the railroad tracks, in a neighborhood known as Chinatown (Gaumer 1985).

After Stanford died in 1893, his wife Jane fired 150 employees, cut salaries, and reduced vineyard acreage. She wanted to disassociate Stanford University from winemaking and alcohol consumption. In 1915, she sold the final grape harvest to Lodi winemakers and uprooted the vines. She used some of the land to plant wheat and alfalfa. In April of 1915, Stanford University purchased 400 acres of fertile river

bottom land along with the water rights from the president of Cone and Kimball Company of Vina. The property was located on Deer Creek, adjacent to Leland Stanford's ranch land, and was planted with alfalfa, and prune and peach orchards (Southwest Shasta Historical Group 2013).

4.0 METHODS

4.1 Personnel Qualifications

All phases of the cultural resources investigation were conducted or supervised by Registered Professional Archaeologist Katherine Knapp, RPA, who meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historical archaeologist. Fieldwork was conducted by Field Director Stephen Pappas and architectural historian Jeremy Adams. The updated architectural evaluation of the Vina Helitack Base was researched and prepared by Mr. Adams, who meets the Secretary of the Interior's Professional Qualifications Standards for history and architectural history. Lisa Westwood, RPA provided quality assurance for the project.

Katherine Knapp, MS, RPA is a Registered Professional Archaeologist with more than 16 years of cultural resource management, contract archaeology, and teaching experience. She has managed projects in northern and southern California, northern and central Utah, Arizona, the Northwest, the Midwest, the Plains, the Southeast, Virginia, and the Middle East. A veteran of the U.S. Army, she exceeds the Secretary of the Interior's Professional Qualifications Standards for prehistoric archaeologist, holding a B.A. degree in Anthropology and an M.S. degree in Anthropology (Archaeology). Ms. Knapp has been the sole or co-author to more than 30 cultural resources inventory reports and technical reports and she has also written, contributed to, and edited a variety of environmental compliance documents including Environmental Assessments (EAs), Environmental Impact Statements (EISs), and Environmental Impact Reports (EIRs). She has conducted evaluations of cultural resources for eligibility to the NRHP and CRHR and is experienced in the development of mitigation measures for Section 106 (NHPA) and CEQA projects.

Jeremy Adams meets the Secretary of the Interior's Professional Qualification Standards for Architectural History and History, holding an M.A. degree in Public History and a B.A. degree in History, with four years' experience specializing in historic resources of the built environment. He is skilled in carrying out historical research at repositories such as city, state, and private archives, libraries, CHRIS information centers, and historical societies. He has experience conducting field reconnaissance and intensive surveys. Mr. Adams has conducted evaluations of cultural resources for eligibility to the NRHP and CRHR and has specialized experience evaluating electric transmission utilities.

Stephen Pappas is a Staff Archaeologist and Field Director for ECORP and has nine years of experience in cultural resources management, primarily in California and New Mexico. He holds a B.A. degree in Anthropology and has participated in all aspects of archaeological fieldwork, including survey, test excavation, data recovery, and construction monitoring. He has extensive familiarity in meeting the cultural resource requirements of CEQA and Section 106 of the NHPA.

4.2 Records Search Methods

A records search for the property was completed at the Northeast Information Center (NEIC) of the California Historical Resources Information System at California State University-Chico on 21 November 2013 (NEIC search #W13-194; Attachment A). The purpose of the records search was to determine the extent of previous surveys within a 0.5-mile (800-meter) radius of the proposed project location, and whether previously documented prehistoric or historic archaeological sites, architectural resources, or traditional cultural properties exist within this area.

In addition to the official records and maps for archaeological sites and surveys in Tehama County, the following historic references were also reviewed: Historic Property Data File for Tehama County (Office of Historic Preservation 2012); The National Register Information System (National Park Service 2013); Office of Historic Preservation, California Historical Landmarks website (Office Historic Preservation 2013); California Historical Landmarks (Office of Historic Preservation 1996 and updates); California Points of Historical Interest (Office of Historic Preservation 1992 and updates); Directory of Properties in the Historical Resources Inventory (1999); and Caltrans Local Bridge Survey (Caltrans 2013a); Caltrans State Bridge Survey (Caltrans 2013b).

Other references examined include a DataQuick Property Search and historic General Land Office (GLO) land patent records (BLM 2013). Historic maps reviewed include:

- 1856 GLO Plat Map, T24N, R1W; John C Hays (Surveyor General)
- 1904 USGS Vina, California (1:62,500)
- 1950 (photorevised 1957) USGS Vina, California (1:24,000)

Historic aerial photos taken in 1941, 1947, 1952, 1969, 1972, 1983, 1998 and 2010 were also reviewed for any indications of property usage and built environment.

There is no local historical registry for Vina or other nearby towns.

4.3 Native American Coordination Methods

ECORP contacted the California Native American Heritage Commission (NAHC) on 3 December 2013, to request a search of the sacred land files for the Project Area. Although the search failed to yield information on Native American cultural resources located within or adjacent to the Project Area, the NAHC provided a list of individuals and organizations in the Native American community that may be able to provide information about unrecorded sites in the project vicinity.

ECORP contacted all persons or organizations on the NAHC list by letter on 9 December 2013 to request information on unrecorded cultural resources that may exist within the current Project Area, or to inquire about any concerns regarding sacred sites or traditional cultural properties in the vicinity that might be affected by the proposed action. Phone calls were made to the individuals listed by the NAHC on 7, 8, and 10 January 2014 to ensure that the materials had been received and to further solicit comments (Attachment B).

4.4 Other Interested Party Consultation Methods

A letter was sent to the San Joaquin County Historical Society on 20 February 2014 in order to solicit comments or obtain historical information that the repository might have regarding events, people, or resources of historical significance in the area (Attachment A).

4.5 Field Methods

On 17 December 2013 and 26 March 2014, the entire Project Area was subjected to an intensive pedestrian survey under the guidance of the *Secretary of the Interior's Standards for the Identification of Historic Properties* (National Park Service 1983) using 15 meter transects (Figures 2 and 3). One half day was expended in the field.

At that time, the ground surface was examined for indications of surface or subsurface cultural resources. The general morphological characteristics of the ground surface were inspected for indications of subsurface deposits that may be manifested on the surface, such as circular depressions or ditches. Whenever possible, the locations of subsurface exposures caused by such factors as rodent activity,

water or soil erosion, or vegetation disturbances were examined for artifacts or for indications of buried deposits. No subsurface investigations or artifact collections were undertaken during the pedestrian survey. In addition, the buildings and structures within the Base were reviewed by an architectural historian. The previously recorded building records were updated, and previously unrecorded or documented buildings and structures were recorded.

4.6 Archival Research Methods

Focused archival research on the Base was carried out by ECORP architectural historian Jeremy Adams. The Base was previously inventoried and evaluated between 1991 and 1993 by Thornton as part of a massive effort to inventory and evaluate all CAL FIRE owned and operated fire lookout stations in California (Thornton 1993). The evaluation methods approved by OHP, historical context of fire lookout stations, and previous evaluation considerations presented in the 1993 report were incorporated by reference in this updated evaluation report for the Base.

Additional research was conducted at several online repositories for information related to the local Project Area history, as well as information about fire lookout stations or the Vina Helitack Base, specifically, which would assist in the updated evaluation of the Base.

ECORP also reviewed historical aerial and topographic maps of the Project Area, which assisted in concluding that the site is still currently in its original location and rural setting. In addition, the Base administrative office contained construction records and other documents relating specifically to the building and the property and was researched during the site visit.

The online research, review of historical aerials and topographic maps, construction-related documents, and review of the previous inventory and evaluation reports and contexts prepared by Thornton resulted in sufficient information for ECORP to prepare an updated evaluation and assessment of the Base.

4.7 Evaluation Criteria

4.7.1 Federal Evaluation Criteria

Under federal regulations implementing Section 106 of the NHPA (36 CFR Part 800), cultural resources identified in the Project APE must be evaluated using NRHP eligibility criteria. The eligibility criteria for the NRHP are as follows (36 CFR 60.4):

> "The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess aspects of integrity of location, design, setting, materials, workmanship, feeling, association, and
>
> (A) Is associated with events that have made a significant contribution to the broad patterns of our nation's history and cultural heritage;
>
> (B) Is associated with the lives of persons important in our past;
>
> (C) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
>
> (D) Has yielded, or may be likely to yield, information important in prehistory or history."

In addition, the resource must be at least 50 years old, except in exceptional circumstances (36 CFR 60.4).

Historical buildings, structures, and objects are usually evaluated under Criteria A, B, and C based on historical research and architectural or engineering characteristics. Archaeological sites are usually evaluated under Criterion D, the potential to yield information important in prehistory or history. An archaeological test program may be necessary to determine whether the site has the potential to yield important data. The lead agency makes the determination of eligibility based on the results of the test program and seeks concurrence from the State Historic Preservation Officer (SHPO).

Effects to NRHP-eligible resources (historic properties) are adverse if the project may alter, directly or indirectly, any of the characteristics of an historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

4.7.2 State Evaluation Criteria

Under state law (CEQA) cultural resources are evaluated using CRHR eligibility criteria in order to determine whether any of the sites are Historical Resources, as defined by CEQA. CEQA requires that impacts to Historical Resources be identified and, if the impacts would be significant, that mitigation measures to reduce the impacts be applied.

An Historical Resource is a resource that 1) is listed in or has been determined eligible for listing in the CRHR by the State Historical Resources Commission; 2) is included in a local register of historical resources, as defined in Public Resources Code 5020.1(k); 3) has been identified as significant in an historical resources survey, as defined in Public Resources Code 5024.1(g); or 4) is determined to be historically significant by the CEQA lead agency [CCR Title 14, Section 15064.5(a)]. In making this determination, the CEQA lead agency usually applies the CRHR eligibility criteria.

The eligibility criteria for the CRHR [CCR Title 14, Section 4852(b)] state that a resource is eligible if:

(1) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;

(2) It is associated with the lives of persons important to local, California, or national history.

(3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or

(4) It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition, the resource must retain integrity. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association [CCR Title 14, Section 4852(c)].

Historical buildings, structures, and objects are usually evaluated under Criteria 1, 2, and 3 based on historical research and architectural or engineering characteristics. Archaeological sites are usually evaluated under Criterion 4, the potential to yield information important in prehistory or history. An archaeological test program may be necessary to determine whether the site has the potential to yield important data. The CEQA lead agency makes the determination of eligibility based on the results of the

test program. Cultural resources determined eligible for the NRHP by a federal agency are automatically eligible for the CRHR.

Impacts to a Historical Resource (as defined by CEQA) are significant if the resource is demolished or destroyed or if the characteristics that made the resource eligible are materially impaired [CCR Title 14, Section 15064.5(a)].

5.0 RESULTS

5.1 Records Search

The records search consisted of a review of previous research and literature, records on file with the NEIC for previously recorded resources, and historical aerial photographs and maps of the vicinity.

5.1.1 Previous Research

Four previous cultural resource investigations and one previous archaeological overview have been conducted within 0.5 mile of the property, covering approximately 90 percent of the total area surrounding the property within the record search radius (Table 1). Two of those studies are linear surveys of portions of Highway 99, which are adjacent to the Project Area. One study consists of a large corridor overview, also linear, along Highway 99. Two previous studies are located directly within the Project Area. [redacted] The previous studies were conducted between 1990 and 2008 and vary in size from one acre to 24 linear miles.

Table 1 – [redacted]

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

[redacted]

[redacted], a complete archaeological survey of the entire property boundary had not been conducted. In addition, the architectural inventory was conducted in 1991 and is out of date, and did not include the ancillary buildings and structures located within the Base adjacent to the Control Station; therefore, a pedestrian survey of the APE was warranted.

[redacted] (Table 2).

Table 2 – [redacted]

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

5.1.2 Records

The *Office of Historic Preservation's Directory of Properties, Historic Property Data File* for Tehama County did not include any resources within 0.5 mile of the Project Area (OHP 2012).

The National Register Information System (National Park Service 2013) failed to reveal any eligible or listed properties within the Project Area. [redacted]

Resources listed as *California Historical Landmarks* (Office of Historic Preservation 1996) and on the Office of Historic Preservation website (Office of Historic Preservation 2013) were reviewed on 22 November 2013. [redacted]

Historic GLO land patent records from the BLM's patent information database (BLM 2013) were searched but failed to reveal any federal land patents for the Project Area.

A DataQuick online property search for APN 079-050-14-1 revealed the property consists of 7.35 acres of governmental, public land. No other property history information was on record with DataQuick.

The Caltrans Bridge Local and State Inventories (Caltrans 2013a, Caltrans 2013b) [redacted]

The *Handbook of North American Indians* (Goldschmidt 1978) lists the nearest Native American village as *Mitenek* of the River Nomlaki. The village is located northwest of Corning on the western side of the Sacramento River, approximately 12 miles northwest of the Project Area.

No response to the letter sent to the Tehama County Historical Society has been received to date.

5.1.3 Map Review and Aerial Photographs

The review of historical aerial photographs and maps of the Project Area provide information on the past land uses of the property. Based on this information, the property may have initially been used for grazing or ranching. Following is a summary of the review of historical maps and photographs.

- An 1856 GLO Land Plat map shows no development or identified properties within or near the Project Area.
- The 1904 USGS California, Vina (1:62,500) map shows the area where the Project is located as open land with roads and development located nearby, but not within the Project Area.

- Aerial photographs taken on 27 January 1941 indicate a possible dirt road following the alignment of the current Highway 99 located southwest of the Project Area. The land within the Project Area consists of open, unmodified grassland.
- Aerial photographs taken on 13 June 1947 and 4 July 1952 indicate the same dirt road following the alignment along the current Highway 99 and unmodified grassland; however, an east-west trending property fence line or boundary marker is indicated directly south of the Project Area.
- The 1950 (photo revised 1957) USGS California, Vina (1:24,000) map shows Highway 99 and identifies a base in the Project Area for the first time.
- Aerial photographs taken on 3 August 1969 reveal the Helitack Base property northeast of an improved two-lane road. The property appears to include a tree-lined perimeter, and a road leading from Highway 99 to a single rectangular structure. The structure appears to match the location of the Control Station.
- Aerial photographs taken on 10 July 1972 and 4 July 1983 are poor quality, indicating only a possible structure in the location of the Control Station.
- Aerial photographs taken on 11 August 1998 show the property in its current state, with the exception of the current standing helicopter hangar on the eastern end of the property.

5.2 Native American Coordination Results

A search of the Sacred Lands File by the NAHC failed to indicate the presence of Native American cultural resources in the project area. Follow-up telephone calls were successful in contacting the Native American contacts. James Hayward, Sr. stated that the Redding Rancheria did not have any concerns regarding the Project; however, if an inadvertent discovery is found during ground-disturbing activities, he requested that the County coroner and local tribes be contacted. Cody Pata of the Paskenta Band of Nomlaki Indians stated that the tribe does not have any concerns regarding the project and that the helitack base is slightly outside of their tribal territory. A record of all correspondence is provided in Attachment B. If any additional comments are received after the submission of this report, then they will be forwarded to the lead agencies for further consideration and appropriate action.

5.3 Other Interested Party Consultation Results

No responses to the letters sent to the San Joaquin Historical Society have been received to date.

5.4 Archival Results

5.4.1 CAL FIRE History

The California Department of Forestry and Fire Protection (CAL FIRE) was established in 1905 during the Conservation Movement of the early 20th century (Thornton 1993). The Act of 1905 granted the State Forester, E.T. Allen, the right to appoint local fire wardens and maintain a fire patrol at designated locations during times of emergency. The forestry department and state forester were synonymous through 1919. The department was based in Sacramento and consisted of a large group of local fire wardens funded by their local jurisdictions, and did not receive financial support from the State.

In 1919, the California legislature appropriated $25,000 for fire prevention and suppression, and the U.S. Forest Service provided $3,500 for rangers. The source of this funding was a result of the Weeks Law of 1911, which provided aid for cooperative fire protection between States and the Forest Service. Initially there were four rangers, headquartered in Redding, Oroville, Placerville and Auburn. By 1920, there were ten rangers overseeing ten districts: Shasta County, Butte and Yuba counties, Placer and Nevada counties, El Dorado and Amador counties, Tehama County, Colusa County, Lake County, and Santa Cruz, Santa Clara, and San Mateo counties. In 1921, the State legislature appropriated $20,000 for the building of a physical operating plant for CAL FIRE on 30 acres of land in Yolo County near Davis. The State Highway Commission and the Board of Forestry established a state forestry nursery at this site to provide

planting stock for highway and public land beautification. This operating plant was the beginning of the first state-funded building projects for CAL FIRE. The first state-funded fire lookout was erected on Mount Bielawski in the Santa Cruz Mountains (Thornton 1993).

The Clarke-McNary Act of 1924 replaced the Weeks Act, and expanded federal assistance for state forestry programs. Governor Clement Calhoun Young established the California Division of Forestry in 1927, which removed administration responsibility of the State's parks from the State Board of Forestry. By 1931, California hired its first seasonal firefighters (Thornton 1993).

During the Great Depression, Franklin Delano Roosevelt created Emergency Conservation Work (ECW) Programs. One program, the Civilian Conservation Corps (CCC), established fire suppression camps throughout the State, and they erected 50 new fire lookouts between 1934 and 1936. All of these sites were part of the CAL FIRE detection system, and many CCC camps became permanent fire stations. During World War II, Governor Earl Warren appointed William Moore as Director of the Department of Natural Resources, the parent agency of the California Division of Forestry. Moore committed the State to hire and pay the salaries of all full-time and seasonal employees for CAL FIRE, the statewide wildland fire protection department. Post-World War II, the State began a prison “honor camp” program where inmates were used for conservation and fire protection projects. This led to the creation of the “Youth Honor Camp System,” collaboration between the California Youth Authority and the California Division of Forestry. Today, CAL FIRE oversees state and privately-owned wilderness areas, and administers the laws established under the Forest Practice Act of 1945 and 1973, that regulates commercial timber harvesting on non-federal lands (Thornton 1993).

Fire lookout stations have played a vital role in California’s fire management program over the past century. These iconic stations are slowly disappearing as population densities change, and new technologies dictate new facilities. The remaining fire lookout sites are old enough to be considered historical cultural resources, and both the Forest Service and CAL FIRE have been interested in preserving the State’s fire detection heritage.

5.4.2 Vina Helitack Base History

The original Vina Fire Control Station and Lookout was constructed in 1954 and was a one engine fire station used to support fire protection in Tehama County. In 1961, the original building was struck by lightning and burned to the ground. Almost immediately, in 1962, the station was rebuilt in the same style in which it was originally constructed (Thornton 1993). The evaluations are all based on the building constructed in 1962, not the original building that was destroyed and no longer exists. The station has a cupola-style lookout tower designed for spotting wildfires many miles away, but the cupola has not been staffed since the late 1960s. The cupola tower still has a firefinder, is regularly maintained, and augments other fire lookouts when needed.

In 1955, the Vina Fire Control Station housed only a CAL FIRE Schedule B fire engine. The station added a Schedule A fire engine to its inventory a short time later. In 1974, CAL FIRE established a helitack base at Vina, and the helicopter replaced the Schedule B fire engine. The Schedule A engine remained in service through 1980, but currently no engines are housed at the facility. For the first eight years of helicopter service, the Base contracted with a private vendor for a helicopter pilot and for helicopter maintenance. In 1982, CAL FIRE began its own helicopter program, and replaced the contract helicopter with a UH-1F model. CAL FIRE hired its own civil service pilots, but still contracted for helicopter maintenance. In 1989, CAL FIRE replaced the UH-1F copter with a UH-1H Superhuey that is still in operation. The new helicopter has a Bambi bucket with a 324-gallon capacity. The Base currently services Tehama and Glenn counties, and is the initial responder for portions of Lassen, Plumas, and Trinity counties along with the Mendocino National Forest (CAL FIRE 2007).

5.5 Field Survey Results

The Project Area was surveyed on 17 December 2013 with an additional linear survey on 26 March 2014 of approximately 0.6 mile in length and 20 meters in width along the northbound State Route 99 right-of-way. The surveys were conducted using transects spaced 15 meters apart. The northeastern portion of the Project Area consisted of a modified ground surface due to landscaping, pavement, and helitack base structures and facilities (Figure 4). The remaining portions of the Project Area surrounding the helitack facilities consisted of hill slopes covered with weeds, grasses, and exposed gravelly soil (Figure 5). These portions had an overall good surface visibility (70 percent visibility) due to sparse, short grasses and areas of exposed soil. These areas appeared to have previously been mowed, most likely for fire suppression; however, ground disturbance appeared to be minimal. As a result of the pedestrian survey, no newly identified historical resources beyond the helitack facilities were discovered. [redacted]

The Base consists of a fenced complex containing one large Control Station, a helicopter hangar, a fuel storage shed, an equipment garage, and ancillary structures for the Control Station including one small pump house and one propane tank.

5.5.1 Control Station and Ancillary Structures

The Control Station is a large corrugated metal building with a mess hall, office, barracks, and two engine bays with a cupola extending from the top. The exterior walls and roof are constructed of corrugated metal, with the walls painted green and the roof painted mustard yellow. The north wing houses a kitchen, mess hall, and barracks. The north wing's front façade has one double-paned sliding aluminum frame window with a wooden privacy trellis that obscures the view. The wing has a double-cross gable entryway to the mess hall with a covered front-gabled porch with three steel balustrades. The porch gable projects from underneath the front gable of the roof. The door is flanked by two sliding aluminum frame windows. The centrally located office has a set-back entry with two doors perpendicular to one another.

Figure 4. Vina Helitack Base Control Station and landscaped area, (view East) 17 December 2013

Figure 5. Unmodified grass fields, overview, (view South) 17 December 2013

A two-story cupola lookout tower is above the entry and abuts the engine bay. It has a square cross-section with a hipped roof. The top floor has a wood, wrap-around porch with a 4.5-foot railing. The south section has two large bay doors, each 10 feet, 5 inches wide. The roof is side-gabled and has a higher elevation than the roof of the north and central sections of the building. All of the windows in the Control Station are double-paned sliding windows, but the casing around the western elevation of the barracks differs from the other windows. The white casing is plastic instead of aluminum and is wider than the narrow casings around all of the other windows. There are round eave vents around the circumference of the building except for the western elevation of the barracks. The rear elevation of the Control Station has a metal stairway leading to the observation tower. There are two horizontal windows on the east elevation of the south section, and two vertical windows on either side of two horizontal windows on rear elevation of the central section.

The northern wing addition joins the original building at a right angle so the rear elevation is L-shaped. There is one large air conditioning unit near the rear stairway, and a smaller unit on the east façade of the barracks. The western façade of the barracks is u-shaped, and there is a small yard with a clothes line. In the center of the yard, there is a propane tank mounted on a concrete slab with a label dated 1945. In close proximity to the north wing is a detached pump house with a side gabled roof. It has a large aluminum door facing north and it is constructed of the same materials as the Control Station.

5.5.2 Other Base Buildings

There is a helicopter facility on the eastern end of the property with a large hangar, fuel shed, a jet fuel tank with a 10,000-gallon capacity, and a helipad. Construction of these structures began in 1999 and was completed in 2000, and they are built of the same materials as the original building. The hangar is front-gabled and the south hangar door has a width of 16 feet, 3 inches. The northern hangar door has a width of 12 feet, 5 inches.

There is a maintenance garage in the back of the Control Station with a gabled roof and large garage door. A covered porch with a metal green roof extends along its northern façade. The southern façade has a door and a window. The garage is painted green but the roof is unpainted. On the southwestern side, there is a cubic shed with an aggregate exterior that is attached by cables to a radio tower.

5.6 Evaluation

Previous Evaluation (Thornton 1993)

Beginning in 1983, the Forest Service's Region 5 initiated a statewide survey and thematic study of all existing fire lookout stations. The inventory was conducted between 1983 and 1987 of several Federal, State, and locally owned stations, and documented their architecture and history as well as developed a substantial context for these types of facilities. Mark Thornton, the consulting historian contracted for the inventory, eventually conducted a historic significance evaluation of 173 Forest Service lookout stations in California in 1987. Thornton developed a systematic method for evaluating the fire lookout stations, which was reviewed and approved by the California OHP. The final inventory and evaluation, approved method, and substantial historic context concluded that 75 of these properties were found to be eligible for the NRHP. None of the eligible Forest Service stations were placed on the NRHP at that time.

Thornton again conducted a statewide inventory of fire lookout facilities owned by CDF in 1991. Based on his research, Thornton then evaluated the facilities and wrote a report entitled *An Inventory and Historical Significance Evaluation of CDF Fire Lookout Stations* for CAL FIRE, published in April of 1993. The Vina Helitack Base Control Station was inventoried and evaluated by Thornton and included in the 1993 report to CDF. The evaluation methodology approved by OHP, historical context of fire lookout stations, and previous evaluation considerations presented in the 1993 report will be incorporated by reference in this updated evaluation report for the Base.

CAL FIRE considers all of its fire lookout stations to have implicit historic significance, but some are better examples than others. CAL FIRE uses a numerical rating system, developed in 1987, to evaluate the significance of their fire lookout stations. The numerical ratings allow the comparison of the relative historical significance, including association with events, people, or patterns of history, of like-kind buildings recorded during the same time period. The numerical rating system, however, does not evaluate the fire lookout stations for their potential to possess important information to history and therefore does not adequately evaluate the properties under criteria D or 4. The 1986 rating system was revised in 1991 during the comprehensive inventory and evaluation of CAL FIRE lookout stations. The updated rating system developed by CAL FIRE and revised by Thornton is described below.

The ratings of each building focus on the age, association, and rarity of a building. Fire lookout stations that score at least 17 points are candidates for nomination, and those scoring 15 to 16 points require special consideration on a case-by-case basis when subject to adverse impacts. Those buildings scoring lower than 15 are not considered eligible resources. The rating system is divided into three areas: structure, site, and context.

Structure includes:

- integrity of design (excellent=0, good=-2, fair=-5, poor=-10);
- aesthetic integrity (excellent=0, good=-1, poor=-2);
- and interior integrity (good=0, fair=-1, poor=-2).

Parameters under site are:

- integrity of location (excellent=0, good=-1, fair=-2,poor=-3);
- integrity associated with equipment and buildings (contributing=2, neutral=0, non-contributing=-2;
- aesthetics of the natural setting (good=0, fair=-1, poor=-2);
- special features of tower (point value = # of features);
- special features of cab (same as for tower);
- height of live-in tower (0, 1, 2, 4, 6-score increases with height); and
- height of observation-only tower (same as live-in tower).

Context includes:

- association (assumed all fire lookouts are associated with the Forest Service or CDF=5 and if have national, state or local association-receive a maximum of 5 additional points-if unknown=0);
- surviving number or rarity (1 left=10, 2=9 etc., 10 or more=0); and
- construction date (1991 point system-pre-1920=12, 1921-1932=8, 1933-1941=6, 1942-1945=4, 1946-1955=2, 1955-present=0).

The northern wing of the Vina Helitack Base Control Station building was added in the late 1970s. An evaluation of the Vina Helitack Base was completed by Thornton in 1993 using the point-based rating system (Attachment D). Thornton's evaluation indicates that its aesthetic integrity is excellent because the original building retains its original design, workmanship, and material. The Base has integrity of location because it is on its original site and there are no modern intrusions that do not contribute to its function. Thornton did not find any significant special features, although the cupola has a polygonal design (a pyramidal hip roof), and the cab has a gable roof.

These features are listed on the Lookout Evaluation System-Classification list created by Thornton and indicate that they are not incredibly rare features. According to Thornton, the Base lacks integrity of design. The addition of a northern wing barracks, kitchen, and mess hall significantly altered the exterior

appearance of the building. Other alterations to the original design are lightning protection, added in 1962, and the 1972 replacement of the internal stair access to the cupola with an external steel stairway on the back of the building (Thornton 1993).

Even though the Base was not yet 50 years old in 1993, the Control Station building was still evaluated as part of the comprehensive evaluation of all fire lookout stations conducted by Thornton. Using this rating system, the Base was originally evaluated as not eligible for inclusion on the NRHP. The Base scored 3 points in evaluation and is considered not historically significant. The building received a room addition on the north side in the 1970s, which significantly reduced the integrity of the building. The internal staircase to the cupola was also replaced with an external staircase in 1972. Also, the original Vina Forest Fire Station, as it was originally named, was destroyed by lightening in 1961 and was rebuilt in 1962. The reconstructed 1962 building was renamed the Vina Helitack Base. The evaluation in 1993, however, did not consider the potential for the Base to possess information important in history and therefore was not evaluated under criteria D and 4. The updated evaluation below includes considerations for all criteria including criteria D and 4.

Updated Evaluation

Since the evaluation by Thornton (1993), the Control Station has not received any significant modifications or alterations. Building records were available regarding construction and modification history at the Base and were reviewed and photographed during the site visit. Only regular maintenance, including painting and landscaping, is recorded for the building. Photographs of the Control Station taken in 1993 were also reviewed and compared to the current condition of the building. Review of these photographs concluded that the building has not received any major alterations, additions, or modifications since 1993. The building is still clearly associated with CAL FIRE and fire lookout stations.

The original evaluation utilized the numerical rating system, which included a category in regard to the date of construction. The building received a score of “0” from the original evaluation for not having been old enough to be considered eligible for inclusion on the NRHP or CRHR. The equivalent of that score in today’s value would be “2” because the building would qualify as of age to be considered a cultural resource, though it would be within the first ten years of qualifying age. According to the numerical rating evaluation system, adding “2” to the original numerical rating system still does not bring enough value to the historical significance of the building for it to be eligible for the NRHP or CRHR. The numerical rating evaluation system; however, does not adequately evaluate the property against all four NRHP or CRHR criteria. Therefore, an updated evaluation of the base against the NRHP and CRHR criteria is below.

The previous evaluation compiled appropriate historical and architectural contexts for fire lookout stations and several lookout stations were compared to establish a historical significance evaluation of each station. Since the previous evaluation, the building has received minimal, routine maintenance, which has not reduced, or increased, the historical significance of the building from the 1993 evaluation. The Base location, function, and setting have not changed since the original evaluation. The context and defining characteristics outlined in the 1993 evaluation, which define historical significance for each fire lookout station, are still relevant today.

The Base is associated with the theme of fire detection within the context of fire lookout stations. Though it is associated with the California Department of Forestry, it has not made a significant contribution to the broad patterns of the history of the Departments fire protection system or the town of Vina. The fire protection system was already in place prior to the Base in Vina and the Base only served to expand the existing system into Tehama County. (NRHP and CRHR Criteria A and 1) The Base is also not associated with any individual important in history. Several California Forestry workers have worked at the Base since it opened for operation and a number of site supervisors have taken management responsibility for it. No historically significant individual is directly linked with the Base (NRHP and CRHR Criteria B and 2) The Base was not constructed by any noted master architect and does not represent any significant

architectural style. It was constructed to serve the purpose of a fire lookout station with components, such as the cupola, to carry out that need. The design and function was unique to the location it served and does not embody any distinctive characteristics of a time, period, or method of construction. (NRHP and CRHR Criteria C and 3) Archival and historical research on the Base has been exhausted by means of two evaluations; one conducted in 1993 and the current evaluation in 2013. In addition, the Base does not have underground facilities or the potential to possess additional information important to history that has not already been adequately researched and recorded. (NRHP and CRHR Criteria D and 4)

The Base fails to retain sufficient integrity. The Base has received many additions to the main building including additional wings, sleeping corridors, and a kitchen, all constructed to appear as though they are part of the original construction of the building. Adding additions in a fashion that make it appear original significantly retracts from the historical integrity of the original building. In addition, the cupola was originally accessed through an internal staircase, is not only accessible from an added external staircase. The Base does retain integrity of location, setting, and association, but no longer retains integrity of design, materials, workmanship, or feeling. Regardless of integrity, the Base is recommended not eligible for the NRHP or CRHR.

The helicopter hangar and helipad were added in 1999 and 2000 and are not old enough to be considered cultural resources. A review of historical aerials shows that the maintenance garage was not present on the Base in 1969; therefore, the garage is not old enough to be considered a cultural resource.

6.0 MANAGEMENT CONSIDERATIONS

6.1 Conclusions

ECORP conducted an archaeological resources inventory and an updated architectural inventory and evaluation of the Project Area on 17 December 2013. No archaeological resources were encountered during the survey. In addition, an updated architectural inventory and evaluation was completed for the Vina Helitack Base, which is comprised of one main base building with attached cupola, and several ancillary buildings and structures. The main base building was originally evaluated in 1993 as not eligible for inclusion on the NRHP under three criteria (A, B, and D). An updated evaluation against all NRHP and CRHR criteria and consideration of integrity did not reverse this recommendation. The ancillary buildings and structures, including the helicopter hangar, helipad, and equipment garage, were constructed in 1999 and 2000 are not old enough to be considered cultural resources and therefore did not require evaluation. Therefore, the Vina Helitack Base is evaluated as not eligible for the NRHP and CRHR under any criteria and is not considered a Historical Resource under CEQA or a historic property under the NHPA.

6.2 Recommendations

In accordance with State of California Public Resources Code (PRC), Sections 5024 and 5024.5, RESD must submit the DPR 523 forms and technical report to the SHPO for review and either concurrence or comment regarding whether or not the resource should be added to the agency's Master List of State-Owned historical resources. If RESD and SHPO agree that the resource is not eligible for the Master List, then further consultation with SHPO will not be required to mitigate any adverse effects to the resource caused by the Project. Until the lead agency and SHPO concur with the identification and evaluation of eligibility of cultural resources, no ground-disturbing activity or demolition should occur.

6.3 Unanticipated Discovery

Although there is a low potential for archaeological deposits in the Project Area, there remains a possibility that unrecorded cultural resources are present beneath the ground surface, and that such resources could be exposed during project construction. Both CEQA and Section 106 of the NHPA require the lead agency to address any unanticipated cultural resource discoveries during project construction. Therefore, ECORP recommends the following mitigation measures be adopted and implemented by the lead agency to reduce potential adverse impacts to less than significant.

> Mitigation Measure #1: Unanticipated Discovery
>
> If subsurface deposits believed to be cultural or human in origin are discovered during construction, then all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeologist, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no-work radius as appropriate, using professional judgment. A Native American monitor, following the Guidelines for Monitors/Consultants of Native American Cultural, Religious, and Burial Sites established by the Native American Heritage Commission, will be required if the nature of the unanticipated discovery is prehistoric.
>
> Work cannot continue within the no-work radius until the archaeologist conducts sufficient research and data collection to make a determination that the resource is either 1) not cultural in origin; or 2) not potentially significant or eligible for listing on the NRHP or CRHR.
>
> If a potentially-eligible resource is encountered, then the archaeologist, lead agency, and project proponent shall arrange for either 1) total avoidance of the resource, if possible; or 2) test excavations to evaluate eligibility and, if eligible, total data recovery as mitigation. The determination shall be formally documented in writing and submitted to the lead agency as verification that the provisions in CEQA/NEPA for managing unanticipated discoveries have been met.

In the event that evidence of human remains is discovered, construction activities within 100 feet of the discovery will be halted or diverted and the requirements of Mitigation Measure #1 will be implemented. In addition, the provisions of Section 7050.5 of the California Health and Safety Code, Section 5097.98 of the California Public Resources Code, and Assembly Bill 2641 will be implemented. When human remains are discovered, state law requires that the discovery be reported to the County Coroner (Section 7050.5 of the Health and Safety Code) and that reasonable protection measures be taken during construction to protect the discovery from disturbance (AB 2641). If the Coroner determines the remains are Native American, the Coroner notifies the Native American Heritage Commission, which then designates a Native American Most Likely Descendant (MLD) for the project (Section 5097.98 of the Public Resources Code). The designated MLD then has 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains (AB 2641). If the landowner does not agree with the recommendations of the MLD, the NAHC can mediate (Section 5097.94 of the Public Resources Code). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (Section 5097.98 of the Public Resources Code). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a document with the county in which the property is located (AB 2641).

The Lead Agency is responsible for ensuring compliance with these mitigation measures because damage to significant cultural resources is in violation of CEQA and Section 106. Section 15097 of Title 14, Chapter 3, Article 7 of CEQA, *Mitigation Monitoring or Reporting*, "the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the

measures it has imposed to mitigate or avoid significant environmental effects. A public agency may delegate reporting or monitoring responsibilities to another public agency or to a private entity which accepts the delegation; however, until mitigation measures have been completed the lead agency remains responsible for ensuring that implementation of the mitigation measures occurs in accordance with the program."

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LIST OF ATTACHMENTS

Attachment A – Records Search Confirmation and Historical Society Letter

Attachment B – Native American Coordination

Attachment C – Project Area Photographs

Attachment D – ***Confidential*** Cultural Resource Site Locations and Site Records

ATTACHMENT A

Records Search Confirmation and Historical Society Letter

Northeast Center of the California Historical Resources Information System

BUTTE
GLENN
LASSEN
MODOC
PLUMAS
SHASTA
SIERRA
SISKIYOU
SUTTER
TEHAMA
TRINITY

123 West 6th Street, Suite 100
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Phone (530) 898-6256
neinfocntr@csuchico.edu

ACCESS AGREEMENT

I.C. File #: W13-194

I, the undersigned, have been granted access to historical resources information on file at the Northeast Information Center of the California Historical Resources Information System.

_____ I understand that any CHRIS Confidential Information I receive shall not be disclosed to individuals who do not qualify for access to such information, as specified in Section III (A-E) of the CHRIS Information Center Rules of Operation Manual, or in publicly distributed documents without written consent of the Information Center Coordinator.

_____ I agree to submit historical Resource Records and Reports based in part on the CHRIS information released under this Access Agreement to the Information Center within sixty (60) calendar days of completion.

_____ I agree to pay for CHRIS services provided under this Access Agreement within sixty (60) calendar days of receipt of billing.

_____ I understand that failure to comply with this Access Agreement shall be grounds for denial of access to CHRIS Information.

Print Name: Jeremy Adams Date: 11/21/13 Signature: [signature]

Affiliation: ECORP Consulting Inc

Address: 2525 Warren Drive City/State/Zip: Rocklin, CA 95677

Billing Address (if different):

Office#: 916-782-4900 Cell#: ~~916~~ Email: jadams@ecorpconsulting.com

Project Name: Vina 2013-152

Purpose of Access: Project Planning

County: Tehama Township/Range/Section:

USGS 7.5' Quad: Vina, Calif.

STAFF USE ONLY

Time:

IN: 1:15

OUT: 2:15

Amy Huberland
Information Center Staff

Backlog ( ) _____

In-House Fees:	1 hours @ $100.00/hour	$ 100.00
Staff Charges:	____ hours @ $40.00/hour	$
Photocopy Charges:	74 copies @ $0.15/page	$ 11.10
Other:		$
TOTAL:		$ 111.10

*** THIS IS NOT AN INVOICE ***

November 22, 2013

Tehama County Genealogical & Historical Society
P.O. Box 415
Red Bluff, CA 96080

RE: Cultural Resources Identification Effort for the Vina Helitack Base Project, Tehama County, California T24N, R1W, Section 18 (ECORP Project No. 2013-152).

Dear Tehama County Genealogical & Historical Society:

ECORP Consulting, Inc. has been retained to assist in the planning of the site improvements for the project indicated above. As part of the identification effort, we are seeking information from all parties that may have knowledge of or concerns with historic properties or cultural resources in the area of potential effect.

Included is a map showing the project area outlined. We would appreciate input on this undertaking from the historical society with concerns about possible cultural properties or potential impacts within or adjacent to the area of potential effect. If possible, please fax your response to my attention at (916) 782-9134. If you have any questions, please contact me at (916) 782-9100 or jadams@ecorpconsulting.com.

Thank you in advance for your assistance in our cultural resource management study.

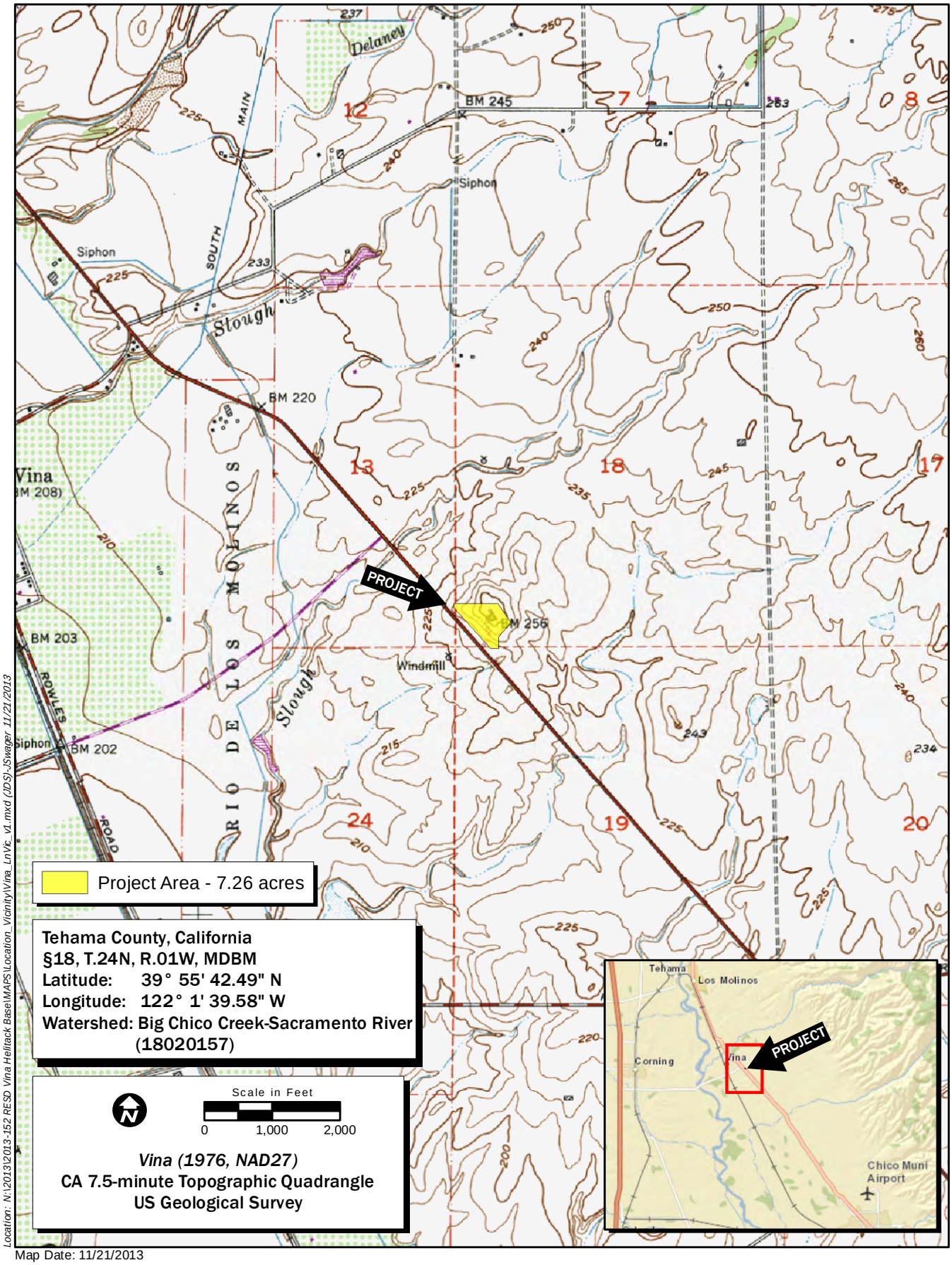
Sincerely,

Jeremy Adams

Jeremy Adams
Architectural Historian

Attachment(s)
Project Location and Vicinity Map

2525 Warren Drive, Rocklin, California 95677 • Tel: (916) 782-9100 • Fax: (916) 782-9134 • Web: www.ecorpconsulting.com



Location: N:\2013\2013-152 RESD Vina Helitack Base\MAPS\Location_Vicinity\Vina_LnVic_v1.mxd (JDS)-JSwager 11/21/2013

Map Date: 11/21/2013
Service Layer Credits: ESRI World Street Map

DRAFT

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 1. Project Location and Vicinity

2013-152 RESD Vina Helitack base

ATTACHMENT B

Native American Coordination

Native American Contacts
Vina Helitack Base 2013-152, Tehama County

Name	Affiliation	Date Contacted			Response Received?	Comments
		1. Letter	2. Phone By SP	3. Phone By SP		
Native American Heritage Commission 915 Capital Mall, Room 364 Sacramento, CA 95814 nahc@pacbell.net (916) 373-3710 (916) 373-5471 Fax	N/A	12/3/2013	N/A	N/A	Yes 12/9/2013	12/6/2013: Rec'd letter. No sacred lands. Provided list of NA contacts.
Paskenta Band of Nomlaki Indians Andrew Freeman, Chairperson PO Box 398 Orland, CA 95963 office@paskenta.org (530) 865-2010 (530) 865-1870 Fax	Nomlaki, Wintun	12/9/2013	1/7/2014	1/8/2014	No	1/7/2014: at the request of the tribal receptionist, S. Pappas E-mailed letter to AF. 1/8/2014: SP left detailed VM for Andrew 1/9/2014: PBNI receptionist Sherri, called and left message with S. Joy stating they had received the E-mailed letter. 1/10/2014: SP Spoke w/ Sherri, she stated that she will forward the letter on to the appropriate contact.
Paskenta Band of Nomlaki Indians Cody Pata (cultural resources/language contact) (808) 281-0714 cell	Nomlaki, Wintun	N/A	N/A	1/8/2014	Yes	1/8/2014: Cody left VM for JA asking to call him back regarding the project. 1/8/2014: SP called Cody. Cody advised that he is the cultural rep for the tribe and all letters are sent to him. He advised that the tribe does not have any concerns regarding the project and that the helitack base is slightly outside their tribal territory.
Redding Rancheria Tracy Edwards, Chief Executive Officer 2000 Redding Rancheria Road Redding, CA 96001 tracye@redding-rancheria.com (530) 225-8979 (530) 241-1879 Fax	Wintu, Pit River, Yana	12/9/2013	1/7/2014	1/8/2014	No	1/7/2014: SP left detailed VM for Tracy 1/8/2014: SP called, office was closed, could not leave VM. 1/10/2014: SP left VM for Tracy
Redding Rancheria Jason Hart, Chairperson 2000 Redding Rancheria Road Redding, CA 96001 (530) 225-8979 (530) 241-1879 Fax	Wintu, Pit River, Yana	12/9/2013	1/7/2014	1/8/2014	No	1/7/2014: SP left detailed VM for Jason 1/8/2014: SP called, office was closed, could not leave VM. 1/10/2014: SP spoke with receptionist, she said that she had relayed the message on to Jason, and he will contact if he has any questions or concerns.

Redding Rancheria James Hayward Sr., Cultural Resources Program 2000 Redding Rancheria Road Redding, CA 96001 jamesh@redding-rancheria.com (530) 242-4543 (530) 241-1879 Fax	Wintu, Pit River, Yana	12/9/2013	1/7/2014	N/A	Yes	1/7/2014: SP spoke with James. He advised that the tribe does not have any information or concerns regarding the project; however, if an inadvertent discovery is found during construction activities, that the proper procedures are put in place (i.e. contact the coroner, tribes).

Sacred Lands File & Native American Contacts List Request

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd
West Sacramento, CA 95691
(916) 373-3710
(916) 373-5471 – Fax
nahc@pacbell.net

Information Below is Required for a Sacred Lands File Search

Project: Vina Helitack Base 2013-152

County Tehama

USGS Quadrangle

Name: Vina, Calif.

Township 24N Range 1W Section(s) 18

Company/Firm/Agency:
ECORP Consulting, Inc.

Contact Person: Jeremy Adams

Street Address: 2525 Warren Drive

City: Rocklin Zip: 95677

Phone: (916) 782-9100

Fax: (916) 782-9134

Email: jadams@ecorpconsulting.com

Project Description:

See attached letter and map.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

December 3, 2013

Ms. Debbie Pilas-Treadway
Associate Governmental Program Analyst
Native American Heritage Commission
1550 Harbor Blvd
West Sacramento, CA 95691

RE: Cultural Resources Identification Effort for the Vina Helitack Base in Tehama County, California T24N, R1W, Section 18 (ECORP Project No. 2013-152).

Dear Ms. Pilas-Treadway:

ECORP Consulting, Inc. has been retained to assist in the planning of the development on the project indicated above. As part of the identification effort, we are seeking information from all parties that may have knowledge of or concerns with historic properties or cultural resources in the area of potential effect.

Included is a map showing the project area outlined. We would appreciate input on this undertaking from the Native American community with concerns about possible traditional cultural properties or potential impacts within or adjacent to the Area of Potential Effects. Please understand that this is not a request for location, data or any other information that may be deemed sensitive or confidential to individual Native Americans, Native American organizations, or Federally Recognized Tribes. Information on other parties that may have interests or concerns in the undertaking would be appreciated, so that we may coordinate such comments with the lead agency. Please fax your response to my attention at (916) 782-9134. If you have any questions, please contact me at (916) 782-9100.

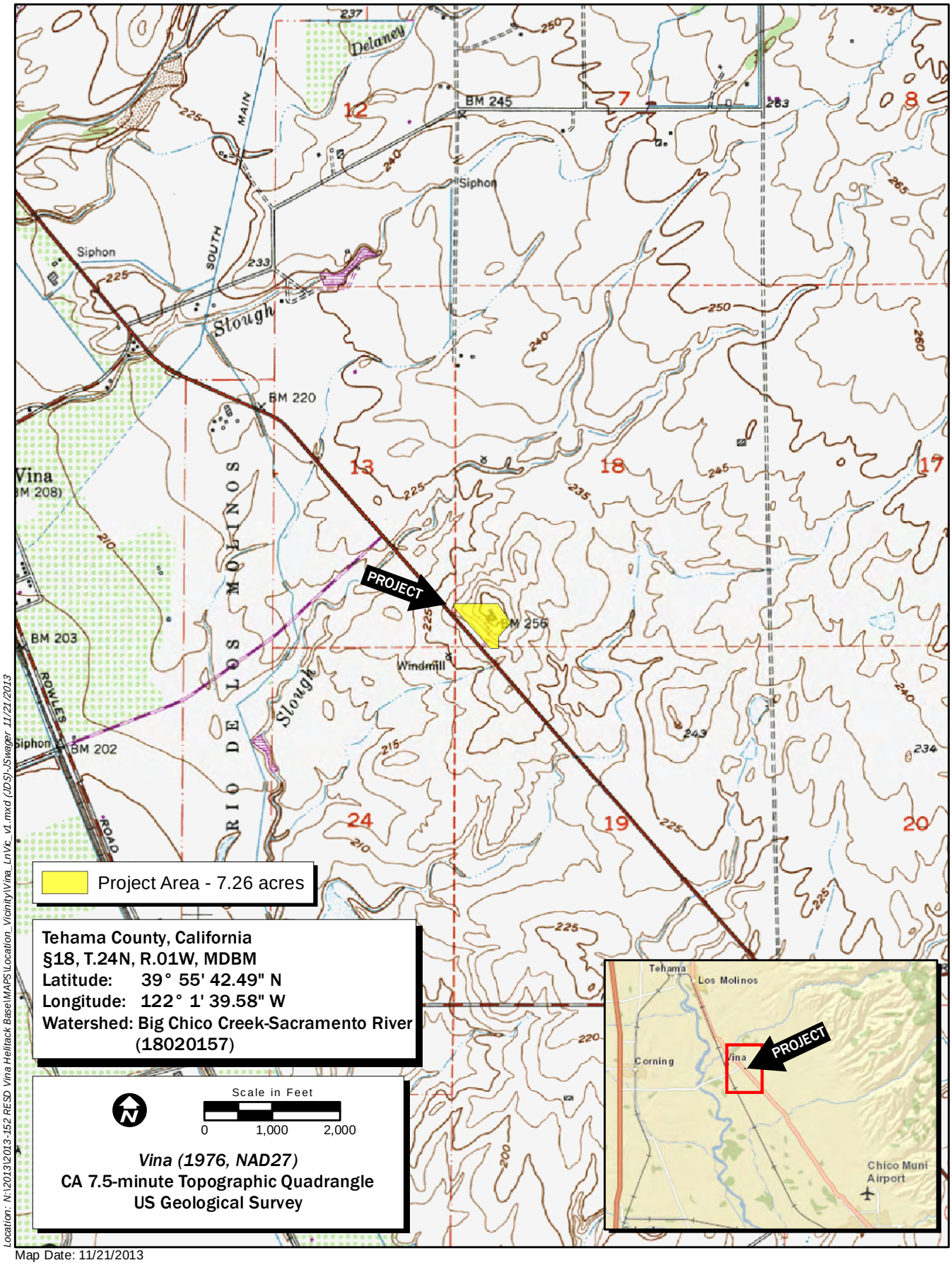
Thank you in advance for your assistance.

Sincerely,

Jeremy Adams

Jeremy Adams
Architectural Historian

2525 Warren Drive, Rocklin, California 95677 • Tel: (916) 782-9100 • Fax: (916) 782-9134 • Web: www.ecorpconsulting.com



Location: N:\2013\2013-152 RESD Vina Helitack Base\MAPS\Location_Vicinity\Vina_LnVic_v1.mxd (JDS)-JSwager 11/21/2013

Map Date: 11/21/2013
Service Layer Credits: ESRI World Street Map

DRAFT

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 1. Project Location and Vicinity

2013-152 RESD Vina Helitack base

STATE OF CALIFORNIA

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., ROOM 100
West SACRAMENTO, CA 95691
(916) 373-3710
Fax (916) 373-5471

Edmund G. Brown, Jr., Governor

December 6, 2013

Jeremy Adams
ECORP Consulting, Inc.
2525 Warren Drive
Rocklin, CA 95677

Sent by Fax: 916-782-9134

Number of Pages: 2

Re: Vina Helitack Base 2013-152, TehemaCounty

Dear Mr. Adams,

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 373-3711.

Sincerely,

Rob Wood
Associate Government Program Analyst

Native American Contact List
Tehama County
December 5, 2013

Paskenta Band of Nomlaki Indians
Andrew Freeman, Chairperson
PO Box 398 Nomlaki
Orland , CA 95963 Wintun
office@paskenta.org
(530) 865-2010
(530) 865-1870 Fax

Redding Rancheria
Tracy Edwards, Chief Executive Officer
2000 Redding Rancheria Road Wintu
Redding , CA 96001 Pit River
tracye@redding-rancheria.com Yana
(530) 225-8979
Fax: (530) 241-1879

Redding Rancheria
Jason Hart, Chairperson
2000 Redding Rancheria Road Wintu
Redding , CA 96001 Pit River
(530) 225-8979 Yana
(530) 241-1879 - Fax

Redding Rancheria Cultural Resources
James Hayward Sr., Cultural Resources Program
2000 Redding Rancheria Road Wintu
Redding , CA 96001 Pit River
jamesh@redding-rancheria.com Yana
530-242-4543
530-410-2873 - cell
Fax: (530) 241-1879

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Vina Helitack Base 2013-152, Vina USGS Quadrangle, Tehama County

12/06/2013 10:35 FAX 916 657 5390 NAHC 002

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

09 December 2013

Paskenta Band of Nomlaki Indians
Andrew Freeman, Chairperson
PO Box 398
Orland, CA 95963

RE: Cultural Resources Identification Effort at Vina Helitack Base, Tehama County, California (ECORP Project No. 2013-152).

Dear Andrew:

ECORP Consulting, Inc. is currently conducting a cultural resources inventory of an approximately 7-acre parcel located near Vina in Tehama County. The study is being conducted in advance of approval of a proposed site improvement project. The project area is situated within the existing California Department of Forestry and Fire Protection (CDF) helitack base adjacent to Highway 99, specifically in Section 18 of Township 24N, Range 01W MDBM. For your reference, the boundaries of the project area are marked on the enclosed 1976 U.S. Geological Survey Vina, California 7.5' topographic quadrangle map.

The purpose of the study is to identify cultural resources that could be affected by the proposed project, as required by Section 106 of the National Historic Preservation Act (NHPA) and the California Environmental Quality Act (CEQA). The investigation included a records search conducted with the North East Information Center at Chico State University and a search of the Native American Heritage Commission's Sacred Lands File. The search of the Sacred Lands file did not identify any known Native American cultural resources within the immediate project vicinity; however, the Commission provided us with your name and contact information.

As part of this study, ECORP would like to identify archaeological, historic resources, or locations that are of cultural importance to the local Native American community. We would appreciate any information you may have regarding Native American cultural resources located in or near the proposed project location that could be affected by the proposed development of the parcel. We invite you to offer comments on the project, and we will forward them to the Section 106 lead agency for consideration and appropriate action. The lead agency will respond to your comments as soon as the Section 106 process is initiated. At this time, however, cultural resources investigations are being conducted for project planning purposes only. ECORP is gathering information on potentially unrecorded cultural resources that might be affected by this project.

We encourage you to participate in this process, so that potential impacts to Native American resources can be proactively addressed and minimized to the greatest extent feasible. We would like to receive a response from you about this project within the next two weeks. If we have not heard from you within 30 days of the receipt of this letter, we will assume that you do not wish to comment on this project. If you have any questions, please feel free to call me at (916) 782-9100 or via email at jadams@ecorpconsulting.com. Thank you for your assistance and participation in this project.

Sincerely,

Jeremy Adams

Jeremy Adams
Architectural Historian

Enclosures, as stated

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

09 December 2013

Redding Rancheria
James Hayward Sr., Cultural Resources Program
2000 Redding Rancheria Road
Redding, CA 96001

RE: Cultural Resources Identification Effort at Vina Helitack Base, Tehama County, California (ECORP Project No. 2013-152).

Dear James:

ECORP Consulting, Inc. is currently conducting a cultural resources inventory of an approximately 7-acre parcel located near Vina in Tehama County. The study is being conducted in advance of approval of a proposed site improvement project. The project area is situated within the existing California Department of Forestry and Fire Protection (CDF) helitack base adjacent to Highway 99, specifically in Section 18 of Township 24N, Range 01W MDBM. For your reference, the boundaries of the project area are marked on the enclosed 1976 U.S. Geological Survey Vina, California 7.5' topographic quadrangle map.

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Sincerely,

Jeremy Adams

Jeremy Adams
Architectural Historian

Enclosures, as stated

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

09 December 2013

Redding Rancheria
Jason Hart, Chairperson
2000 Redding Rancheria Road
Redding, CA 96001

RE: Cultural Resources Identification Effort at Vina Helitack Base, Tehama County, California (ECORP Project No. 2013-152).

Dear Jason:

ECORP Consulting, Inc. is currently conducting a cultural resources inventory of an approximately 7-acre parcel located near Vina in Tehama County. The study is being conducted in advance of approval of a proposed site improvement project. The project area is situated within the existing California Department of Forestry and Fire Protection (CDF) helitack base adjacent to Highway 99, specifically in Section 18 of Township 24N, Range 01W MDBM. For your reference, the boundaries of the project area are marked on the enclosed 1976 U.S. Geological Survey Vina, California 7.5' topographic quadrangle map.

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Sincerely,

Jeremy Adams

Jeremy Adams
Architectural Historian

Enclosures, as stated

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

09 December 2013

Redding Rancheria
Tracy Edwards, Chief Executive Officer
2000 Redding Rancheria Road
Redding, CA 96001

RE: Cultural Resources Identification Effort at Vina Helitack Base, Tehama County, California (ECORP Project No. 2013-152).

Dear Tracy:

ECORP Consulting, Inc. is currently conducting a cultural resources inventory of an approximately 7-acre parcel located near Vina in Tehama County. The study is being conducted in advance of approval of a proposed site improvement project. The project area is situated within the existing California Department of Forestry and Fire Protection (CDF) helitack base adjacent to Highway 99, specifically in Section 18 of Township 24N, Range 01W MDBM. For your reference, the boundaries of the project area are marked on the enclosed 1976 U.S. Geological Survey Vina, California 7.5' topographic quadrangle map.

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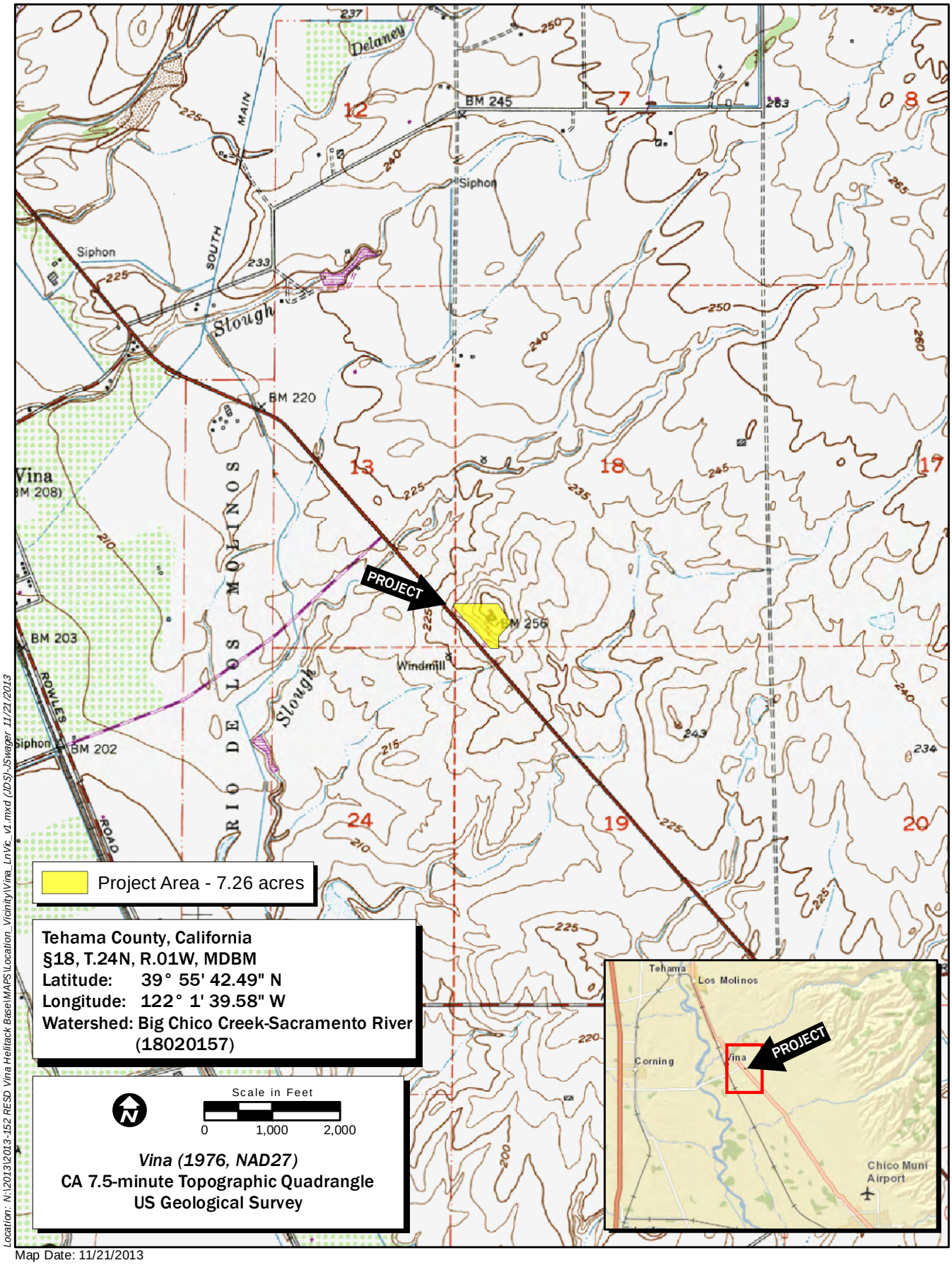
Sincerely,

Jeremy Adams

Jeremy Adams
Architectural Historian

Enclosures, as stated



Location: N:\2013\2013-152 RESD Vina Helitack Base\MAPS\Location_Vicinity\Vina_LnVic_v1.mxd (JDS)-JSwager 11/21/2013

Map Date: 11/21/2013
Service Layer Credits: ESRI World Street Map

DRAFT

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 1. Project Location and Vicinity

2013-152 RESD Vina Helitack base

Stephen Pappas

From: Stephen Pappas
Sent: Tuesday, January 07, 2014 11:08 AM
To: 'office@paskenta.org'
Cc: *Project E-Mail
Subject: RESD Vina Helitack Native American coordination letter
Attachments: Freeman Vina letter.pdf

Andrew Freeman,

Attached is a PDF'd copy of the letter for the Vina Helitack project we mailed on December 9, 2013. If you have any questions or concerns regarding this project, please feel free E-mail or call me at the number below. Thank you again for your time and assistance with our Native American coordination efforts for this project.

Regards,

Stephen Pappas
Staff Archaeologist/Field Director
ECORP Consulting, Inc.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2525 Warren Dr, Rocklin, CA 95677
Ph: 916.782.9100 ♦ Fax: 916.782.9134
spappas@ecorpconsulting.com ♦ www.ecorpconsulting.com

ATTACHMENT C

Project Area Photographs

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PHOTOGRAPH RECORD

Primary #
HRI#
Trinomial

Page 1 **of** 1 **Resource/Project Name:** Vina Helitack Base **Year** 2013
Camera: Lens Size: 35mm
Film Type and Speed: Digital Negatives Kept at: ECORP Consulting, Inc.

Mo.	Day	Time	Exp./Frame	Subject/Description	View Toward	Accession #
12	17			Southeast end of Project overview	NE	001
12	17			Southeast end of project looking at adjacent property	East	002
12	17			Sign for helitack base and easement area	North	003
12	17			Western open area overview w/base in background	North	004
12	17			Bare dirt in center of open area	North	005
12	17			Concrete pad in open area	NW	006
12	17			Rear area of base (east fence line) at SE corner	North	007
12	17			Southern end overview from SE corner	West	008
12	17			Radio towers in NE corner	North	009
12	17			East end from NE portion	South	010
12	17			Complex from SE portion	NW	011
12	17			North end of APE	West	012
12	17			Burn pile in north end	SW	013
12	17			Survey monument marker sign in north end	North	014
12	17			Detail of monument marker	Detail	015
12	17			Concrete pad in open area	NW	016
12	17			Detail of representative surface visibility	South	017
12	17			North end of APE from front of office	North	018
12	17			Overview of helitack pad	East	019
12	17			Overview of SW open field from propane tank	SW	020
12	17			Grass/Grapes area between pavement and field	NE	021

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CAL
FIRE

DIVISION OF HIGHWAYS
SURVEY MONUMENT
MARKER
TO DISTURB THIS MONUMENT IS
PUNISHABLE BY LAW

STATE OF CALIFORNIA
DIV. OF HIGHWAYS
V-1NA
F.C.C.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PHOTOGRAPH RECORD

Primary #
HRI#
Trinomial

Page 1 **of** 1 **Resource/Project Name:** Vina Helitack Base **Year** 2013
Camera: Lens Size: 35mm
Film Type and Speed: Digital Negatives Kept at: ECORP Consulting, Inc.

Mo.	Day	Time	Exp./Frame	Subject/Description	View Toward	Accession #
12	17			Front cross view of complex	East	P1050937
12	17			West addition façade	NE	P1050938
12	17			Office/ capola façade	NE	P1050939
12	17			Cross front façade	North	P1050940
12	17			Cross front façade – step back	North	P1050941
12	17			SE Elevation	NW	P1050942
12	17			Rear garage cross view	West	P1050943
12	17			Rear cross elevation	West	P1050944
12	17			Rear capola elevation	SW	P1050945
12	17			Rear barrack cross	South	P1050946
12	17			NW elevation	SE	P1050947
12	17			Shed – main barracks, pump house	East	P1050948
12	17			Interior bay stair	overview	P1050949
12	17			USCG Survey marker detail	Detail	P1050950
12	17			Rear elevated windows	West	P1050951
12	17			Propane tank panel	West	P1050952
12	17			Main barrack pump	Overview	P1050953
12	17			Pump house	NW	P1050954
12	17			Capola cross view close up	East	P1050955
12	17			Fuel shed	East	P1050956
12	17			Fuel liquid storage tank	South	P1050957
12	17			Fuel storage shed	West	P1050958
12	17			Helicopter hanger	East	P1050959
12	17			Helicopter hanger overview w/ moveable pad	NE	P1050960
12	17			Overview of facility	North	P1050961
12	17			East elev helicopter hanger	West	P1050962
12	17			NE cross elev helicopter hanger	SW	P1050963
12	17			Maintenance garage	North	P1050964
12	17			SE view cross elev maintenance garage	NE	P1050965
12	17			Rear elev cupola and stairs	West	P1050966
12	17			Power supply shed and aggregate siding	East	P1050967
12	17			Overview of power pole NE of facilities	NE	P1050968
12	17			Close up on pole mark	Detail	P1050969
12	17			Overview of power pole NE of facilities	North	P1050970

P1050968

P1050969

P1050970

P1050937

P1050938

P1050939

P1050940

P1050941

P1050942

P1050943

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P1050947

P1050948

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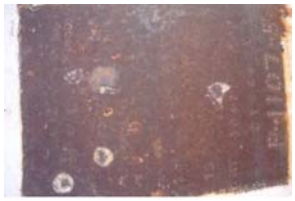
P1050950

P1050951


P1050952

P1050953

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P1050965

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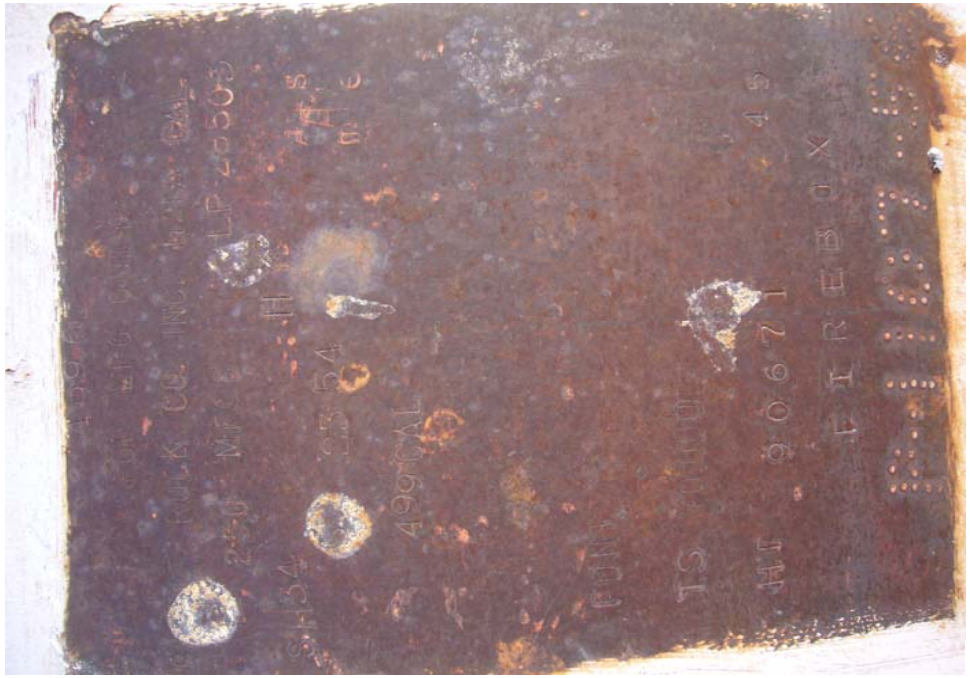
P1050967

PG&E
030892
KV

FIRE
HOSE

MAIN
MAIN
BARRACKS
PUMP HOUSE

REFERENCE MARK U.S. COAST & GEODETIC SURVEY
WASHINGTON, D.C. FOR INFORMATION WRITE TO THE DIRECTOR
VINA
NO 3
1939



DIESEL
GASOLINE

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PHOTOGRAPH RECORD

Primary #
HRI#
Trinomial

Page 1 **of** 1 **Resource/Project Name: RESD Vina** **Year** 2014

Camera: Lens Size: 35mm

Film Type and Speed: Digital Negatives Kept at: ECORP Consulting, Inc.

Mo.	Day	Time	Exp./Frame	Subject/Description	View Toward	Accession #
3	26			ROW overview from SE of APE	NW	001
3	26			Overview of turn-out near SE end of APE	NW	002
3	26			View of APE near southern end	NW	003
3	26			Fenceline and APE near southern portion	North	004
3	26			50% visibility soil NW of entrance	NW	005
3	26			Mounded dirt NW portion of APE	West	006
3	26			Swale NE of APE	NE	007
3	26			Swale NE of APE towards road	West	008
3	26			Overview of APE from NW end	SE	009
3	26			Cut in hill side in NW portion of APE	SE	010
3	26			Culvert at driveway to entrance	NW	011
3	26			SE portion of APE overview	SE	012

012

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ATTACHMENT D

Confidential Cultural Resource Site Locations and Site Records

This Attachment contains information on the specific location of cultural resources. This information is not for publication or release to the general public. It is for planning, management and research purposes only. Information on the specific location of prehistoric and historic sites is exempt from the Freedom of Information Act and California Public Records Act.

APPENDIX D

Paleontological Assessment

26 February 2014

Jennifer Parson
Department of General Services, RESD
RESD-PMDB-Environmental Services, 4th Floor, MS 509
P.O. Box 989052
Sacramento, CA 95798

RE: Paleontological Records Search and Preconstruction Assessment for the Vina Helitack Base Replace Facility Project (ECORP Project No. 2013-152)

Dear Ms. Parson:

At your request, ECORP carried out a paleontological records search and preconstruction assessment for the Vina Helitack Base Replace Facility Project (Project) to support the preparation of an environmental document under the California Environmental Quality Act (CEQA). The Project is located on a currently developed parcel of 7.26 acres near the town of Vina in southern Tehama County, California (Figure 1. *Project Location and Vicinity*). The Project would replace the existing helitack base facility. Replacement of the facility will provide necessary fire protection needs to the local area and region for the next 50 years. The work consists of demolition of existing buildings and associated facilities and construction of new buildings as well as other improvements, including site grading, paving for road and parking, new septic system and leach field, new water well, and widening of State Highway 99. The ground-disturbing activities vary across the project depending on the facility being constructed. In general, ground disturbance of up to approximately 15 feet below the surface will be necessary for the installation of new infrastructure such as water filtration systems and domestic and fire water distribution systems as well as grading and surface disturbance. However, ground disturbance could extend up to 500 feet below the surface at the locations proposed for deep water supply wells.

METHODS

A paleontological assessment was requested from the University of California Museum of Paleontology (UCMP) on 10 January 2014. Conducted by Museum Scientist (Microfossil Collections) Ken Finger, Ph.D., the assessment included a search of the paleontology specimen collection records for the Project area and vicinity. In addition, a query of the UCMP online catalog records, a review of regional geologic maps from the California Geological Survey, and a review of existing literature on paleontological resources of Tehama County was conducted by Staff Biologist Marin Meza. The purpose of the paleontological assessment was to determine the sensitivity of the Project area, whether or not known occurrences of paleontological resources are present within or immediately adjacent to the Project area, and whether or not implementation of the Project could result in significant impacts to paleontological resources. Paleontological resources include mineralized (fossilized) or unmineralized bones, teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains.

Sedimentary rock units may be described as having (a) high (or known) potential for containing significant nonrenewable paleontological resources; (b) low potential; and (c) undetermined potential (SVP 2014). The determination of a site's (or rock unit's) degree of paleontological potential is first founded on a review of pertinent geological ad paleontological literature and on locality records of specimens deposited in institutions. The sensitivity of rock units in which fossils occur are divided into three operational categories:

I. High Potential. Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a have potential for containing significant nonrenewable fossiliferous resources. These units include but are not limited to, sedimentary formations, volcanic formations, and some low-grade metamorphic rocks, which contain significant nonrenewable paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. Sensitivity comprises both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace and (b) the importance of recovered evidence for new and significant taxonomic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Rock units that contain potentially datable organic remains older than late Holocene, including deposits associated with animal nests or middens, and rock units that may contain new vertebrate deposits, traces, or trackways are also classified as significant.

II. Undetermined Potential. Rock units for which little information is available are considered to have undetermined fossiliferous potentials. Field surveys by a qualified vertebrate paleontologist to specifically determine the potentials of the rock units are required before programs of impact mitigation can be developed.

III. Low Potential. Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow determination that some rock units have low potentials for yielding significant fossils. Such units will be poorly represented by specimens in institutional collections. These deposits generally will not require protection or salvage operations.

RESULTS

The UCMP has 394 paleontological specimens from 820 localities in Tehama County (UCMP 2014a). However, not all specimens in the UCMP collections have been cataloged and digitized, and other specimens have likely been recorded within the vicinity of the Project area. The specific location of all localities is available only to qualified paleontologists, and the location of these occurrences relative to the Project area is unclear without more extensive archival research. Of the 394 specimens recorded within Tehama County, 61 are fossil invertebrates, 246 are microfossils, one is a plant fossil, and 86 are fossil vertebrates (UCMP 2014a). Additionally, according to the Tehama County 2008-2028 General Plan Draft Environmental Impact Report (EIR) (Tehama County 2008), a few paleontological resources have been found throughout the unincorporated regions of Tehama County. These include a mastodon jaw bone fossil found near the Red Bank Creek in the central portion of the County, a mastodon leg bone found along Mill Creek in the central region of the County, and a bone fragment from an ancient humpless camel found near Paskenta. No fossil specimens are catalogued in or around the Project area (UCMP 2014a, Finger 2014; see attachment).

According to the *Geologic Atlas of California – Ukiah Sheet* (Jennings and Strand 1960), the geologic feature that underlies the Project area is classified as Pleistocene nonmarine sedimentary rock (Qc). It is further described as Pliocene and/or Pleistocene sandstone, shale, and gravel deposits (QPc) that are mostly loosely consolidated (Gutierrez *et al.* 2010). The Soil Resource Report for Tehama County, California (NRCS 2011) indicates that the there are three soil types on-site: Anita clay (Ad), Redding gravelly loam, 3-8 percent slopes (RnB), and Tuscan clay loam, 1-8 percent slopes (TtB). Anita clay is described as clay in the upper 15 inches with alluvium derived from volcanic rock as the parent material/restrictive layer between 15-25 inches below the surface. Redding gravelly loam is composed of gravelly loam near the surface followed by clay and then a restrictive layer approximately 23-25 inches below the surface. The restrictive layer is described as alluvium derived from metamorphic and sedimentary rock. Tuscan clay loam is composed of clay loam near the surface followed by cobbly clay loam and very cobbly clay. The restrictive layer is approximately 18-22 inches below the surface, and like Anita clay, it is described as alluvium derived from volcanic rock.

Tehama County is within the Great Valley Geomorphic province (Tehama County 2008). The province includes the area known as the Great Central Valley of California, which extends approximately 400 miles north to south and 50 miles east to west (Tehama County 2008). The majority of rocks and deposits found within the province are sedimentary but also include volcanic rocks (Buer 2007). Both the Tehama and Tuscan Formations are present within Tehama County and are known to yield locally abundant vertebrate fossils (Hanson 2005). In addition, sedimentary rock and Plio-Pleistocene gravel deposits, such as those listed for the Project, can have low to high potential for containing significant nonrenewable fossiliferous resources. However, neither formation, considered sensitive, is located within the Project nor are fossil specimens known to be in or around the Project. Moreover, according to the EIR (Tehama County 2008), there are no geologic sites which may contain paleontological resources within Tehama County that are considered to be unique. Tehama County is not known to be rich in paleontological resources. While no unique sites and resources have been identified, there still exists the possibility that many of these resources remain undiscovered and should be taken under consideration upon any grading, excavation, or construction. With the requirement for an on-site survey for discretionary projects as provided by the Tehama County General Plan, impacts to a unique paleontological resource site can be reduced to less-than-significant levels after mitigation.

The geology within the Project area was created during the Cenozoic era, approximately 65.5 million years ago to present day (UCMP 2014b). Within the Cenozoic era, both the Pliocene and Pleistocene epochs occurred. The Pliocene epoch, approximately 5.3 to 2.6 million years ago, was a time when the global climate became cooler and more arid (UCMP 2014c). The beginning of this epoch saw numerous fluctuations in temperature, which gave way to the general cooling trend near the end of the Pliocene. The Pleistocene epoch, beginning after the end of the Pliocene, was approximately 2.6 million to 11,700 years ago and included the most recent episodes of global cooling (UCMP 2014d). Much of the world's temperate zones were alternately covered by glaciers during cool periods and uncovered during the warmer interglacial periods when the glaciers retreated (UCMP 2014d). The Pleistocene epoch was characterized by the presence of distinctive large land mammals and birds including the mammoth, mastodon, longhorned bison, saber-toothed cat, and giant ground sloth.

RECOMMENDATIONS

The records search determined that no fossil vertebrate localities are located within or near the Project area. However, based on the geologic rock unit and soil types present within the Project area, it was determined that the Project has undetermined potential for containing nonrenewable paleontological resources. Field surveys by a qualified vertebrate paleontologist to specifically determine the potentials of the rock units are recommended before programs of impact mitigation for such areas may be developed.

Thank you for the opportunity to assist you in your project planning. If you have any questions, you may contact me by phone at (916) 782-9100 or by email at mmeza@ecorpconsulting.com.

Sincerely,

Marin Meza
Staff Biologist
ECORP Consulting, Inc.

Attachment(s)

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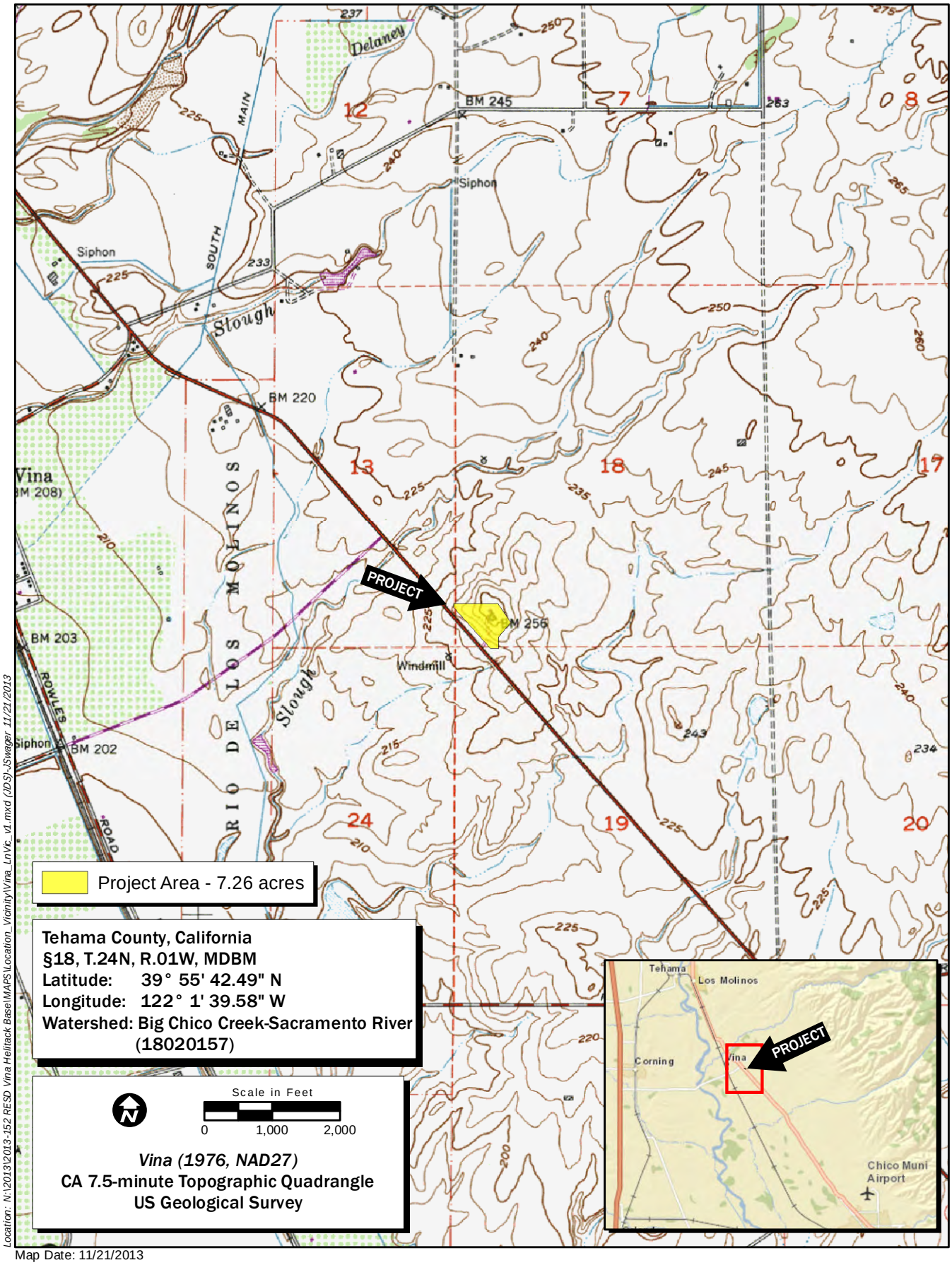

Location: N:\2013\2013-152 RESD Vina Helitack Base\MAPS\Location_Vicinity\Vina_LnVic_v1.mxd (JDS)-JSwager 11/21/2013

Map Date: 11/21/2013
Service Layer Credits: ESRI World Street Map

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ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 1. Project Location and Vicinity

2013-152 RESD Vina Helitack base

From: Ken Finger
To: Marin Meza;
Subject: Re: Records search request
Date: Monday, January 13, 2014 1:23:42 PM

Marin,

As per your request, I have performed the requested records searche for the Vina Helitack Base Facility Replacement project in southern Tehama County. There are no fossil localities listed in the UCMP database within 0.5 miles of the site.

An invoice totalling $250.00 for this service will be forthcoming.

Thank you.

Ken

On Jan 10, 2014, at 4:29 PM, Marin Meza wrote:

<UCMP Records Search Letter_Vina Helitack.pdf>

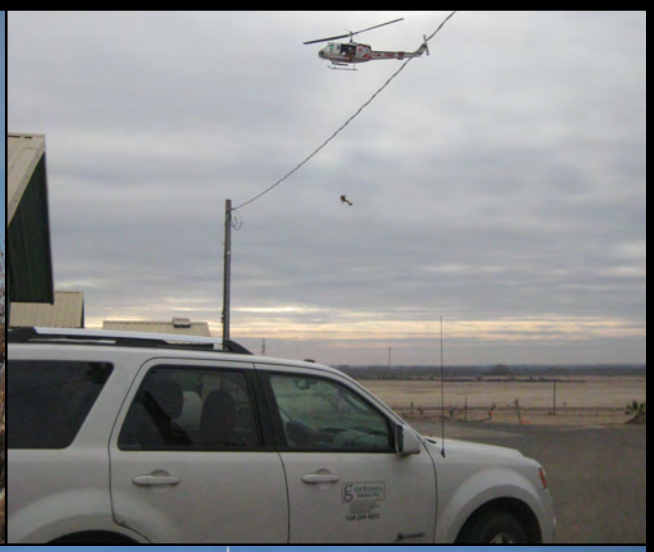
APPENDIX E

Geotechnical Report, Web Soil Survey

DRAFT GEOTECHNICAL REPORT
VINA HELITACK BASE REPLACEMENT
TEHAMA COUNTY, CALIFORNIA

Prepared For:

Omni·Means, Ltd.



CGI Technical Services Inc.

omni·means
ENGINEERS·PLANNERS

CGI TECHNICAL SERVICES INC.

February 21, 2014
CGI: 13-1629.26

Mr. Russ Wenham, P.E.
OMNI•MEANS, LTD.
330 Hartnell Avenue, Suite B
Redding, CA 96002

Subject: **DRAFT Geotechnical Study**
Calfire Vina Helitack Base Replacement Project
Tehama County, California

Dear Mr. Wenham,

CGI Technical Services, Inc. (CGI), is pleased to submit this DRAFT geotechnical report to Omni•Means, Ltd., for the Calfire Vina Helitack Base Replacement Project located in Tehama County, California. This report is being submitted in accordance with our proposal dated December 4, 2013.

This report summarizes the geotechnical exploration and the results of laboratory testing performed for the project. As noted in the report, the site is generally geotechnically favorable for the proposed improvements.

The report is being submitted in DRAFT format to allow you, Nichols, Melburg & Rossetto, Inc., and Calfire the opportunity to provide comments or to solicit questions regarding content. Once we have received comments regarding the DRAFT report, we will revise the document, as appropriate, and issue signed, stamped copies for your use.

We appreciate the opportunity to perform this study. If you have any questions pertaining to this report, or if we may be of further service, please contact us at (530) 244-6277 at your earliest convenience.

Regards,

CGI TECHNICAL SERVICES, INC.

1612 Wedding Way
Redding, CA 96003
Ph: 530.244.6277
Fax: 530.244.6276

James A. Bianchin, C.E.G.
Senior Engineering Geologist

Azeddine Bahloul, P.E., G.E.
Senior Geotechnical Engineer

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APPENDICES

Appendix A ..... Subsurface Exploration
Appendix B ..... Laboratory Testing

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1 GENERAL

This report presents the results of CGI Technical Services, Inc. (CGI), design-level geotechnical study for the proposed Vina Helitack Base Replacement Project located in Tehama County, California. CGI has prepared this report at the request of Omni•Means, Ltd. (Omni•Means), the project civil engineer, and Nichols Melburg & Rossetto, Inc. (NMR), the project architect. The project location is shown on Plate 1 – Site Location Map. The following sections present our understanding of the project, the purpose of our study, and the findings, conclusions, and recommendations of this study. Our services were performed in general conformance with our proposal dated December 4, 2013.

1.1 PROJECT LOCATION

The Vina Helitack Base (Base) is located in the Vina area of unincorporated Tehama County, as shown on Plate 1. It is located east of Highway 99 approximately 2,150 feet south of the intersection of South Avenue and Highway 99. Latitude and longitude for the approximate center of the proposed project development area are as follows:

- Latitude: 39° 55' 43.2" (39.928661°)
- Longitude: -122° 1' 40.0" (-122.027220°)

1.2 PROJECT UNDERSTANDING

We understand that the project consists of the demolition of aging portions of the existing Base and replace those demolished buildings with infrastructure that meets the needs of Calfire at this site. We understand that the proposed new structures include:

- 22-bed Barracks/Mess hall building;
- 3-Bay Apparatus building;
- Rescue training tower;
- Generator/Pump/Storage building;
- Two lighted helipads;
- A future addition to the hangar;
- Fuel dispensing system;
- Hose wash rack;
- Two water storage tanks;
- Radio tower; and
- Weather station;

In addition to those structures, we understand that improvements to the water system, fire sprinkler systems, wastewater disposal system, and utilities (buried and above ground) are included in the project. We understand that alteration and paving of access roads, parking, and staging areas around the structures will be performed. In addition, we understand that Highway 99 will be widened in the project area to allow turn pockets for north- and south-

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bound traffic into the Base. Grading will be required to construct the proposed improvements. Plate 2 – Project Elements shows those proposed improvements.

The foundations for the structures are anticipated to consist of shallow foundations (spread footing). Foundation loads are unknown at this time but not anticipated to exceed 5 kips per lineal foot and 50 kips for continuous and isolated foundations, respectively. Ancillary improvements for the project include subsurface utilities, concrete flatwork surrounding the structure and parking area, landscaping, etc.

1.3 STUDY PURPOSE

The purpose of our geotechnical study was to explore and evaluate selected site surface and subsurface conditions in order to provide geotechnical engineering recommendations related to the design and construction of the proposed improvements and to identify potential geologic hazards that could impact the project. Exploration locations for the project are shown on Plate 3 – Geotechnical Map. Those tasks had a three-fold purpose:

- To characterize geologic hazards that pose an adverse effect on the performance of proposed improvements at the Base;
- To estimate settlement and allowable bearing values for underlying soils for use in designing the proposed foundations and slabs for proposed improvements; and
- To develop geotechnical recommendations for the design and construction of the proposed project.

1.4 PREVIOUS WORK PERFORMED & REFERENCES REVIEWED

We know of no previous site specific geotechnical studies that have been performed at or near the project development area. Regional geologic and geotechnical studies and maps were referred to during this study. Section 7 provides references for studies, reports, maps, and other information sources used during this study.

1.5 SCOPE OF SERVICES

Services performed for this study are in general conformance with the proposed scope of services presented in our December 4, 2013 proposal. Our scope of services included:

- Reconnaissance of the site surface conditions, topography, and existing drainage features;
- Attempted acquisition of existing, available geotechnical data relevant to the project site;
- Performance of reconnaissance-level geologic mapping of the project site. The geologic map prepared during this study is shown on Plate 3;
- Advancement of six exploratory drill holes and twelve test pits at selected locations shown on Plate 3. Exploration procedures and Logs of Drill Holes and

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Logs of Test pits are presented in Appendix A – Subsurface Exploration;

- Performance of laboratory testing on selected samples obtained during our field investigation. Laboratory test procedures and results of those tests are presented in Appendix B – Laboratory Testing;
- Evaluation of geologic hazards that could affect the project site;
- Preparation of this report, which includes:
    - A description of the proposed project;
    - A summary of our field exploration and laboratory testing programs;
    - A description of site surface and subsurface conditions encountered during our field investigation;
    - Preparation of cross sections depicting anticipated geological conditions beneath the structure. Those sections are presented on Plate 4 – Geotechnical Cross Sections;
    - A description of ground shaking conditions expected at the site, including 2013 California Building Code (CBC) seismic design criteria;
    - A geotechnical map showing approximate field exploration locations, presented as Plate 3;
    - Geotechnical recommendations for:
        - Site preparation, engineered fill, subdrains and subgrades;
        - Excavatability of underlying earth materials;
        - Suitability of on-site materials for use as engineered fill;
        - Temporary excavations, shoring, and trench backfill;
        - CBC seismic design criteria;
        - Foundation design and construction;
        - Trench backfill and compaction recommendations;
        - Retaining wall design;
        - Cement type based on soil chemistry; and
        - Structural pavement sections.
    - Appendices that present a summary of our field investigation procedures and laboratory testing programs.

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2 FINDINGS

2.1 FIELD INVESTIGATIONS

CGI conducted a geotechnical field investigation to evaluate subsurface soil conditions, and to provide subsurface data for evaluation of the proposed Base redevelopment. Our field geotechnical investigation was limited to reconnaissance-level geologic mapping of the project site and subsurface exploration through excavation of six drill holes and twelve test pits.

The drill holes, designated DH-1 through DH-6, were advanced on January 9 and 10, 2014. The test pits, designated TP-1 through TP-12, were excavated on February 6, 2014. Drill hole and test pit locations are shown on Plate 3. Detailed descriptions of soils encountered are presented on the drill hole and test pit logs included in Appendix A. The soils encountered within the excavations were logged in general accordance with the Unified Soil Classification System (USCS). Surficial and subsurface soil samples were collected and transported to our laboratory for testing. Laboratory test results are included with this report.

2.2 SURFACE CONDITIONS

The Base is located on a prominent knoll that extends about 27 feet above the surrounding, relatively flat plains. The knoll has been graded relative flat at its apex and descends at angles of up to about 10 degrees in all directions.

The site is currently developed with the existing helitack base. That includes a barracks/tower/office/mess building, storage building, hangar, and two Portland cement concrete (PCC) helipads. Asphaltic concrete (AC) paved access roads, parking, and staging areas are located on site. Grass and other landscaping is present at select location around the barracks building, around the primary helipad, and west of the barracks building. A number of trees are present within the base. In areas not landscaped, the ground is covered with low seasonal grasses and weeds. The base is surrounded by fencing.

Drainage within the development area occurs as sheetflow in all directions. Water flowing to the north, east, and south drains onto the surrounding plains. Water flowing to the west drains into drainage swales located along the east side of Highway 99 where it is eventually discharged into drainages crossing the highway. According to project site plans (Omni•Means, undated), elevations at the development area range from about 229 to 259 feet above mean sea level (MSL).

2.3 SUBSURFACE CONDITIONS

Subsurface conditions encountered during this study varied across the site. Soils encountered consisted of sandy gravel, clayey gravel, gravelly sand, silty sand, sandy silt, silty clay, sandy clay, and clay with varying amounts of gravel and possibly cobbles. In general, the northern

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portion of the project, in the vicinity of the proposed barracks and a portion of the apparatus building, underlying sediments consist of clay-rich soils, such as silty clay, sandy clay, and clay, and thin interbeds of granular soils. Those soils range in thickness up to about ten feet, as noted on Plate 4.

Outside of that northern area, the soils consist of silty sand, clayey sand, sandy silt, and clayey silt, with varying amounts of gravel.

Along the southern portion of the project, silty to sandy clay with interbeds of sand and gravel were encountered in the upper thirty feet of the soil profile. Increased clayey to silty sand was encountered in the northern portions of the project. Underlying the clay-rich and granular sediments across the site was a clayey to sandy gravel that was observed at a depth of 25 to 40 feet. The generalized soil profiles encountered at the site are presented on cross sections on Plate 4.

2.4 SOILS & GEOLOGIC CONDITIONS

2.4.1 Regional Geology

The project site is located in the northern Sacramento Valley within the Great Valley Physiographic province. The Great Valley province is bordered to the north by the Klamath and Cascade Physiographic provinces, to the east by the Cascade and Sierra Nevada Physiographic provinces, to the west by the Klamath and Coast Ranges Physiographic provinces, and to the south by the Transverse Ranges Physiographic province.

The Great Valley Physiographic province is about 50 miles wide and 400 miles long. The Sacramento Valley, which forms the northern portion of the province, is about 150 miles long and 40 miles wide (Hinds, 1952). According to Hackel (1966), "The Great Valley is a large elongate northwest-trending asymmetric structural trough that has been filled with a tremendously thick sequence of sediments ranging from Jurassic to recent." Sediment thicknesses of up to 10 miles are reported within the Sacramento Valley; however, in the project area, being at the northern margin of the valley, those thicknesses have been projected to be less than one mile (Hackel, 1966). Sediments within the Great Valley consist of both marine and continental deposits, with most of the sediments underlying the project area consisting of continental deposits.

2.4.2 Local Geologic Setting

The project sit is underlain by the Pleistocene-age Red Bluff Formation, as shown on Plate 5 – Regional Geologic Map (Helley & Harwood, 1985; Helley et al., 1981; Blake et al., 1992). Those materials consist of slightly cemented clayey sand to sandy clay with varying amounts of gravel, cobbles, and, locally, boulders. The Red Bluff Formation was not fully penetrated during this study and is anticipated to project to depths deeper than those affected by construction of this project.

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2.4.3 Soils

The Natural Resources Conservation Service (NRCS, 2014) maps the following soil units within the proposed development area:

- Anita Clay;
- Redding Gravelly Loam, 3 to 8 percent slopes; and
- Tuscan Clay Loam, 1 to 8 percent slopes.

Locations of those mapped soils units are shown on Plate 6 – Soil Service Map. Characteristics of those soils, as reported by NRCS are as follows:

NRCS SOILS INFORMATION

Soil Unit	USCS Symbol	Grain Size (%)			Liquid Limit	Plasticity Index	Hydraulic Conductivity (cm/sec)
		Sand	Silt	Clay			
Anita Clay	CH	22.1	27.9	50.0	60.0	32.5	5.4×10^{-5}
Redding Gravelly Loam	GC	34.5	35.1	30.4	37.2	15.4	3.4×10^{-4}
Tuscan Clay Loam	CL	30.5	32.5	37.0	40.2	19.3	1.7×10^{-4}

2.4.4 Groundwater

Groundwater was not encountered in drill holes and test pits advanced for this study. Historical groundwater information for the water well at the site was obtained from the California Department of Water Resources (DWR, 2014). That well has the following properties:

ON SITE WATER WELL INFORMATION

Well Code	Ground Surface Elevation (MSL)	Total Depth (ft)	Screened Depth Interval (ft)
399290N1220275W001	256.41	102	64' to 76'

Groundwater elevations from that well were measured between May 3, 1965 and October 15, 2012. Groundwater depths during that time period varied from 57.0 to 71.3 feet below the ground surface, as shown on the following graph:

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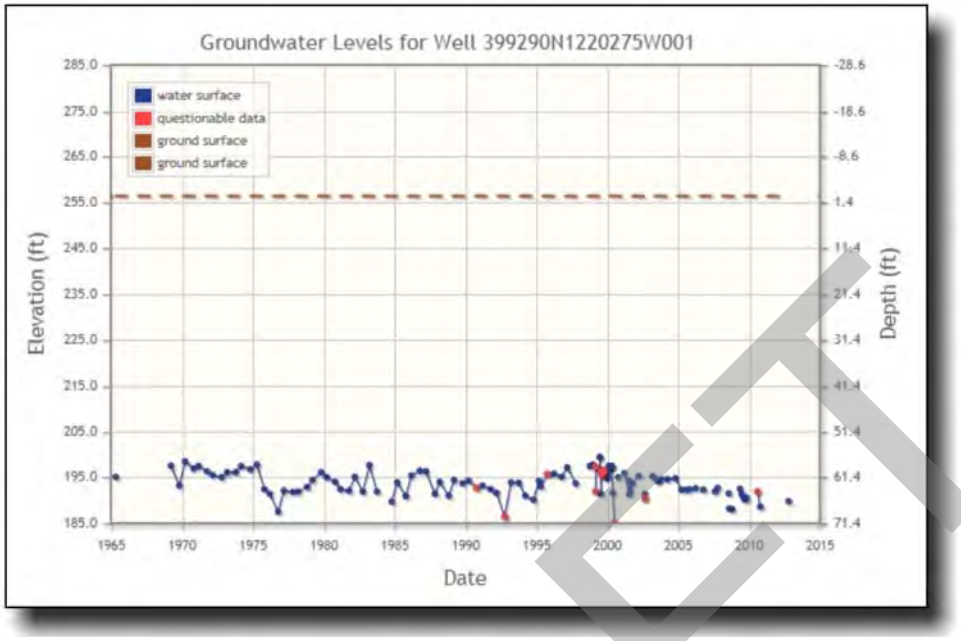

Groundwater elevations will fluctuate over time. It should be anticipated that the depth to groundwater can vary throughout the year and from year to year. Intense and long duration precipitation, modification of topography, and cultural land use changes at the site and at surrounding properties, such as irrigation, water well usage, on site waste disposal systems, utility leakage, and water diversions can contribute to fluctuations in groundwater levels. Localized saturated conditions or perched groundwater conditions near the ground surface could be present during and following periods of heavy precipitation or if on-site sources contribute water. If groundwater is encountered during construction, it is the Contractor's responsibility to install mitigation measures for adverse impacts caused by groundwater encountered in excavations.

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3 GEOLOGICAL HAZARDS

The following sections address geologic hazards that could influence the project and provide a discussion and opinion regarding the potential impact of each of those hazards to the project. The geologic hazards assessment performed for this study conforms to requirements by the State of California for critical facilities such as hospitals, schools, and essential services buildings.

It should be noted that the project site does not lie within any established Geologic Hazards Zones, either within the City of Yreka nor the County of Siskiyou.

3.1 FAULTING & SEISMICITY

3.1.1 Seismic Setting

The State of California designates faults as active, potentially active, and inactive depending on the recency of movement that can be substantiated for a fault. Fault activity is rated as follows:

FAULT ACTIVITY RATINGS		
Fault Activity Rating	**Geologic Period of Last Rupture**	**Time Interval (Years)**
Active	Holocene	Within last 11,000 Years
Potentially Active	Quaternary	>11,000 to 1.6 Million Years
Inactive	Pre-Quaternary	Greater than 1.6 Million Years

The California Geologic Survey (CGS) evaluates the activity rating of a fault in fault evaluation reports (FER). FERs compile available geologic and seismologic data and evaluate if a fault should be zoned as active, potentially active, or inactive. If an FER evaluates a fault as active, then it is typically incorporated into a Special Studies Zone in accordance with the Alquist-Priolo Earthquake Hazards Act (AP). AP Special Studies Zones require site-specific evaluation of fault location and require a structure setback if the fault is found traversing a project site.

The site is not located within an Alquist-Priolo Earthquake Fault Zone and no active faults are known to pass through the project site (Jennings, 1994; Hart & Bryant, 1997). However, a number of potentially active and active faults are located in the project region, as shown on Plate 7 – Regional Fault Map. The following table presents regional fault locations relative to the project site.

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REGIONAL FAULT INFORMATION				
Fault Name	Fault Activity Rating[1]	Distance from Site		Upper Bound Earthquake (M_W)
		Mile	Kilometers	
Foothills Fault System	A	4.4	7.1	6.5
Great Valley 1	A	22.5	36.2	6.7
Battle Creek	PA	32.1	51.7	6.5
Rate for NE California	A	35.5	57.2	7.3
Great Valley 2	A	46.4	74.7	6.4
Hat Creek-MacArthur-Mayfield	A	57.4	92.4	7.0
Great Valley 3	A	57.7	92.8	6.8
Bartlett Springs	A	59.1	95.1	7.1
Round Valley	A	59.8	96.3	6.8
Hunting Valley-Berryessa	A	73.3	117.9	6.9
Lake Mountain	PA	75.0	120.7	6.7
Maacama	A	78.2	125.9	7.1

[1] - A= active, PA = potentially active, per Peterson et al. (1996). Information obtained from Blake (2000a).

As noted on Plate 7, the inactive Chico Monocline fault is located about 5.8 miles east of the site and the inactive Corning fault is located about 10.6 miles west of the project. The closest mapped potentially active fault is the Chico Monocline fault, located about 5.8 miles east of the site. The closest active fault is the Cleveland Hills fault located about 42 miles east of the site.

3.1.2 Deterministic Estimates of Strong Ground Motion

Peak horizontal ground accelerations were estimated for the project site using attenuation relations from Boore et al. (1997) and the computer program EQFAULT (Blake, 2000a). The results of those estimates are shown in the following table:

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DETERMINISTIC GROUND MOTION DATA						
Fault Name	Maximum Credible Magnitude (Mw)	Distance from Site (miles)	Fault Data		Deterministically Estimated Peak Ground Acceleration (g)	
			Length (km)	Slip Rate (mm/yr)[1]	M[2]	M+δ[2]
Foothills Fault System	6.5	4.4	360	0.05±0.03	0.40	0.67
Great Valley 1	6.7	22.5	44	0.1±0.1	0.15	0.25
Battle Creek	6.5	32.1	29	0.5±0.4	0.10	0.17
Rate for NE California	7.3	35.5	230	4.0±2.0	0.12	0.20
Great Valley 2	6.4	46.4	22	0.1±0.1	0.07	0.12
Hat Creek-MacArthur-Mayfield	7.0	57.4	97	1.5±1.0	0.08	0.14
Great Valley 3	6.8	57.7	55	1.5±1.0	0.08	0.13
Bartlett Springs	7.1	59.1	85	6.0±3.0	0.07	0.12
Round Valley	6.8	59.8	53	6.0±3.0	0.06	0.10
Hunting Valley-Berryessa	6.9	73.3	60	6.0±3.0	0.05	0.09
Lake Mountain	6.7	75.0	35	6.0±3.0	0.05	0.08
Maacama	7.1	78.2	81	9.0±2.0	0.06	0.10

[1] – From Peterson et al. (1996).
[2] – M = indicates estimated mean peak horizontal ground acceleration. M+δ = peak horizontal ground acceleration utilizing mean plus at least one standard deviation (84th percentile) for seismicity data.

Soil conditions modeled in the deterministic studies consisted of shallow soils having shear wave velocities averaging 270 meters per second. Based on these evaluations, the site could be subjected to horizontal ground accelerations of at least 0.67g. The causative fault that is responsible for that peak horizontal ground acceleration is a Cascadia Subduction Zone event, located about 78 miles west of the project site. It should be noted that probability and exposure periods are not considered during deterministic evaluations and that, typically, deterministic estimates of strong ground motion for a site generate relatively conservative horizontal ground acceleration values.

3.1.3 Probabilistic Estimates of Strong Ground Motion

Probabilistic evaluations of horizontal strong ground motion that could affect the site were performed using attenuation evaluation methods provided by the U.S. Geological Survey (USGS, 2014). Because the proposed structures will likely be situated on alluvial soils of the Red Bluff Formation, the evaluations were performed using an estimated shear wave velocity in the upper 100 feet (V_{S30}) of the soil column of 270 meters per second. Evaluations were performed for upper-bound (UBE) and design-basis (DBE) probabilistic exposures. The UBE corresponds to horizontal ground accelerations having a 10 percent probability of exceedance in a 100-year exposure period, with a statistical return period of 949 years. The DBE corresponds to horizontal ground accelerations having a 10 percent probability of exceedance in a 50-year, with a statistical return period of 475 years.

The results of these evaluations are presented in the following table:

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PROBABILISTIC GROUND MOTION DATA				
Earthquake Level	**Probabilistic Estimate Exposure Period (years)**	**Probability of Exceedance (%)**	**Return Period (years)**	**Estimated Peak Horizontal Ground Acceleration (g)**
Upper-Bound Ground-Motion	100	10	949	0.24
Design-Basis Ground-Motion	50	10	475	0.18

It should be noted that although the seismic hazard models used for this study predict the probability of exceedance for various levels of acceleration in a given exposure period, the models are not able to account for the effect that the passage of time since past earthquakes has on future earthquake probability. Thus, while time may affect the incipient risk of earthquakes occurring, the UBE and DBE values are based on any 100-year and 50-year exposure period, respectively, regardless of how recently earthquakes have occurred.

3.1.4 CBC Design Recommendations

At a minimum, structures should be designed in accordance with the 2013 CBC seismic design criteria as follows:

CBC SEISMIC DESIGN PARAMETERS		
California Building Code	**Parameter**	**CBC Designation**
Site Coordinates	Latitude	39.928661°
	Longitude	-122.027220°
Section 1613.3.3 Table 1613.3.3(1)	Site Coefficient, F_a	1.303
Section 1613.3.3 Table 1613.3.3(2)	Site Coefficient, F_v	1.831
Section 1613.3.1 Figure 1613.3	Site Class Designation	D
	Seismic Factor, Site Class B at 0.2 Seconds, S_s	0.621g
	Seismic Factor, Site Class B at 1.0 Seconds, S_1	0.284g
Section 1613.3.3	Site Specific Response Parameter for Site Class D at 0.2 Seconds, S_{MS}	0.809g
	Site Specific Response Parameter for Site Class D at 1.0 Seconds, S_{M1}	0.521g
Section 1613.3.4	$S_{DS}=2/3S_{MS}$	0.539g
	$S_{D1}=2/3S_{M1}$	0.347g

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3.1.5 Historical Seismicity

A search of historical earthquakes occurring between 1800 and 1999, listed in the CGS catalog, was performed for a 100-mile radius around the project site (Blake, 2000b). That search found that 235 earthquakes have occurred within that area. Of those earthquakes, only 42 with moment magnitudes (M_W) of 5 or greater and 1 with M_W 6 or greater have occurred in the search area. The largest near-field earthquake to affect the area occurred on January 7, 1881, was estimated to be 5.1 miles from the site, had an estimated M_W of 5.0, and resulted in an estimated ground acceleration of about 0.17g at the site.

3.2 LANDSLIDES

The site is gently sloping. Geologic mapping of the area has not noted any landslides on the property (Helley & Harwood, 1985; Helley et al., 1981; Blake et al., 1992). Observations made at the site and review of aerial photographs did not identify geomorphic features that would be indicative of past or incipient slope failures. It is our opinion that natural landslides pose a low risk to the proposed project.

3.3 LIQUEFACTION AND LATERAL SPREADING

Liquefaction is described as the sudden loss of soil shear strength due to a rapid increase of soil pore water pressures caused by cyclic loading from a seismic event. In simple terms, it means that a liquefied soil acts more like a fluid than a solid when shaken during an earthquake. In order for liquefaction to occur, the following are needed:

- Granular soils (sand, silty sand, sandy silt, and some gravels);
- A high groundwater table; and
- A low density in the granular soils underlying the site.

If those criteria are present, then there is a potential that the soils could liquefy during a seismic event.

The adverse effects of liquefaction include local and regional ground settlement, ground cracking and expulsion of water and sand, the partial or complete loss of bearing and confining forces used to support loads, amplification of seismic shaking, and lateral spreading. In general, the effects of liquefaction on the proposed project could include:

- Lateral spreading;
- Vertical settlement; and/or
- The soils surrounding lifelines can lose their strength and those lifelines can become damaged or severed.

Lateral spreading is defined as lateral earth movement of liquefied soils, or soil riding on a liquefied soil layer, down slope toward an unsupported slope face, such as a creek bank, or

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an inclined slope face. In general, lateral spreading has been observed on low to moderate gradient slopes, but has been noted on slopes inclined as flat as one degree.

Groundwater was reported at depths below 50 feet below the ground surface at the site (DWR, 2014). In addition, soils encountered at the site were predominately fine grained and stiff. Because of those conditions, it is our opinion that liquefaction and/or lateral spreading poses a low risk to the proposed project.

3.4 EXPANSION POTENTIAL

There is a direct relationship between plasticity of a soil and the potential for expansive behavior, with expansive soil generally having a high plasticity. Thus, granular soils typically have a low potential to be expansive, whereas, clay-rich soils can have a low to high potential to be expansive. According to the NRCS (2014; see Section 2.4.3), Plasticity Indices (PI) values for the site range from about 15 to 32. Specific tests performed for this project found PIs ranging from nonplastic to about 10. Soils with PIs in that range correlate to soils having a low expansion potential (Day, 1999), as noted in the following table:

EXPANSION POTENTIAL – PLASTICITY INDEX CORRELATION

Plasticity Index	Correlated Expansion Potential
0 – 10	Very Low
10 – 15	Low
15 – 25	Medium
25 – 35	High
35+	Very High

Taken from Day (1999)

3.5 VOLCANIC HAZARDS

The project site is located proximal to the Cascade Range, which contains numerous active but dormant volcanoes. Volcanic hazards can occur from a variety of causes but are typically associated with the following:

- Ground deformation
- Lava flows;
- Pyroclastic flows;
- Volcaniclastic debris flows;
- Tephra; and/or
- Volcanic gasses

The closest significant eruptive center to the project site is within Lassen National Park (Lassen Volcanic Center, Brokeoff Volcano, Central Plateau, and Dittmar Volcanic Center). Those volcanic sources are located about 47 miles northeast of the project site. In addition, the Maidu and Yana Volcanic Centers are located slightly south of Lassen National Park

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(Clynne & Muffler, 2010). Large eruptive events occur within the Lassen group of volcanic centers have an average recurrence interval of about every 10,000 years; however, those large eruptive events appear to occur as clusters over a shorter time frame with quiescence between (Nathenson et al., 2012). The last major eruptive event for the area was about 1,100 years ago at Chaos Crags, north of Lassen Peak. Relatively smaller events, such as the 1914 and 1917 eruptions of Lassen Peak, can occur more frequently.

Because of the distance between the site and volcanic eruptive centers, the risk of adverse impacts to the project due to ground deformation, lava flows, pyroclastic flows, volcaniclastic debris flows, and hot/poisonous volcanic gasses is low, as shown on Plate 8 - Lahar, Lava, and Ash Hazards (Robinson & Clynne, 2012; Clynne et al., 2012).

The project could be impacted by tephra; however, from a small to large eruptive event. Tephra includes ash, rock, and pumice which are erupted into the atmosphere above a volcano. Large tephra particles typically fall to earth in areas relatively close to the source and are unlikely to affect the project; however, ash can be carried long distances from the source and poses health and structure damage, specifically when thick accumulation of wet ash occur on a structure. However, prevailing wind directions for the site, estimated from data collected at the Chico Municipal Airport and shown on Plate 8, are in a northwest and southeast direction, which would carry ash away from the site. Because of this and due to the distance from volcanic sources, it is our opinion that during an eruptive event, the facility will have realize some ash fall (less than about 3 inches [Clynne et al., 2012]) but the volume should not be too great unless the prevailing winds at that time are in a southwest direction.

3.6 TSUNAMI AND SEICHE INUNDATION

Tsunamis occur due to subaqueous seismic activity and submarine landslides generating long period waves in the ocean that run-up onshore and potentially cause tremendous damage and loss of life. Because of the project's separation from the Pacific Ocean, tsunamis pose no risk to the project.

Seiches are waves that develop within landlocked bodies of water due to distant or near-source earthquakes and from wind shear. Those waves can cause overtopping of impoundments and inundation to adjacent and downstream lands. The project site is not located below or adjacent to land locked bodies of water. Therefore, seiche inundation is not anticipated to pose a risk to the project.

3.7 RADON

Radon is a naturally occurring odorless gas that emanates from the decay of radioactive elements within soil and rock. Radon gas can increase the potential for developing lung cancer and is, thus, a concern regarding indoor accumulations of the gas. Concentrations of radon gas outdoors are typically not of concern due to the reduced potential of concentration of the gas to levels of concern due to wind and lack of a confined space. The

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average concentration of radon in American homes is about 1.3 picocuries per liter and the average concentration in outdoor air is about 0.4 picocuries per liter. The U.S. EPA recommends that individuals avoid long-term exposures to radon concentrations above 4 picocuries per liter.

Generally, it is thought that radon is generated by the decay of uranium and thorium isotopes. The potential of finding those elements in soil or rock are typically greater in shales, fat clays, and some igneous rocks. The project area is underlain by alluvial soils. It has been mapped within Radon Zone 3, which corresponds to areas anticipated to have less than 2 pCi/L of indoor radon gas. It is our opinion that radon gas poses a low risk to the proposed project.

3.8 NATURALLY OCCURRING ASBESTOS

Ultramafic rock, such as serpentinite, amphibolite, peridotite, dunite, pyroxenite, hornblendite, etc., can contain asbestiform minerals, which are fibrous, silica-rich crystals that can cause lung cancer, mesothelioma, asbestosis, and other health-related issues, if present. Typically, six minerals within ultramafic rocks are responsible for the primary, naturally occurring asbestiform (NOA) concerns for health-related issues:

- Chrysotile
- Tremolite
- Actinolite
- Anthophyllite
- Arocidolite
- Amosite

These minerals may or may not be present in ultramafic rocks; thus, the presence of ultramafic rock on a site does not automatically indicate that there is a health hazard on a site. The presence of asbestiform minerals can sometimes be discerned in the field based on visual examination of rock exposures but, most often, must be confirmed using laboratory testing.

Asbestos can be a hazardous material when it becomes airborne and is inhaled, and is typically not considered a hazard when it is not in aerosol form. Inhalation is the primary exposure route of concern, because breathing asbestos fibers may cause them to become trapped in the lungs. Ingestion is another, albeit less common, pathway of concern, because swallowing asbestos fibers may also cause the fibers to be trapped in body tissues. Asbestos is not absorbed through the skin, so merely touching it does not pose a significant risk to human health. Asbestos fibers are not water soluble and do not move through groundwater to any appreciable extent. Based on studies of other insoluble particles of similar size, the expected migration rate of an asbestos fiber through soils by the forces of groundwater is approximately 1 to 10 centimeters (0.4 to 4 inches) per 3,000 to 40,000 years (New Hampshire DES, 2010). Thus, asbestos is not considered a groundwater contaminant.

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Ultramafic rocks are not present within the project area. It is our opinion that NOA does not pose a hazard for the project site. This opinion is supported by Churchill & Hill (2000).

3.9 HYDROCOLLAPSE

Hydrocollapse occurs when water is introduced to poorly cemented soils, resulting in the dissolution of the soil cementation and the volumetric collapse of the soil. In most cases, the soils are cemented with weak clay (argillic) sediments or soluble precipitates. This phenomenon generally occurs in granular sediments situated within arid environments.

We know of no reported instance of hydrocollapse occurring within the project region. In our opinion, hydrocollapse poses a low risk to the proposed project.

3.10 REGIONAL SUBSIDENCE

Regional ground subsidence occurs due to the extraction of subsurface fluids, such as water or oil. In parts of California, ground subsidence has exceeded 20 vertical feet due to oil or water extraction. In Las Vegas, they are currently experiencing localized areas of ground subsidence that exceed 16 feet due to groundwater extraction. With withdrawal of fluids, the pore spaces within the soils decrease leading to a volumetric reduction. If that reduction is significant enough over an appropriately thick sequence of sediments then regional ground subsidence can occur. This typically only occurs within poorly lithified sediments and not within competent rock.

Oil fields are located in the project region but they are found south and west of the project area (Jenkins, 1943). No known oil, gas or high-volume water extraction wells are known to be present in the project area. In our opinion, regional ground subsidence due to fluid extraction is low.

3.11 SOIL CHEMISTRY

One selected sample of near-surface soils encountered at the site was subjected to chemical analysis for the purpose of assessment of corrosion and reactivity with concrete. The samples were tested for soluble sulfates and chlorides. Testing was conducted by HDR/Schiff of Claremont and results are presented below, as well as included in the appendix of laboratory results.

SOIL CHEMISTRY RESULTS

Sample	Sample Depth	Sulfates (ppm)	Chlorides (ppm)	pH	Resistivity (ohms-cm)
DH-5	1' to 3'	10.0	1.1	7.0	5,200

According to the American Concrete Institute ([ACI], 2011), a sulfate concentration below 0.10 percent by weight (1,000 ppm) is negligible. A chloride content of less than 500 ppm is generally considered non-corrosive to reinforced concrete.

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Minimum resistivity testing performed on the soil sample indicated the soils are considered to be moderately corrosive to buried metal objects. A commonly accepted correlation between soil resistivity and corrosivity towards ferrous metals (NACE, 1984) is provided below:

RESISTIVITY & CORROSION CORRELATION	
Minimum Resistivity (ohm-cm)	**Corrosion Potential**
0 to 1000	Severely Corrosive
1,000 to 2,000	Corrosive
2,000 to 10,000	Moderately Corrosive
Over 10,000	Mildly Corrosive

Thus, according to the table above, the soils are estimated to be moderately corrosive based upon the soil resistivity.

Because engineered fill materials will be placed to establish grades and backfill adjacent to concrete structures, we recommend that verification samples be tested to confirm that soils in contact with concrete and steel have similar corrosion potential characteristics as the sample tested for this study.

3.12 HAZARDOUS MATERIALS

The evaluation of the potential presence of hazardous materials on site is typically performed using a Phase I environmental site assessment and/or Phase II environmental site characterization. Neither of those studies was within the scope of this geotechnical study.

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4 CONCLUSIONS AND RECOMMENDATIONS

4.1 GENERAL

Based on the results of our investigation, it is our opinion that the site is suitable for the proposed improvements provided recommendations presented, herein, are utilized during design and construction of the project. Specific comments and recommendations regarding the geotechnical aspects of project design and construction are presented in the following sections of this report and are intended to be refined, where needed, as the project moves into final design and construction.

Recommendations presented, herein, are based upon the preliminary site plans provided by Omni•Means and NMR along with stated assumptions. Changes in the project configuration from those studied during this investigation may require supplemental recommendations.

4.2 GEOLOGIC HAZARDS

It is our opinion that the project has little or no risks from the following geologic hazards:

- Faulting
- Naturally occurring landslides
- Liquefaction and lateral spreading
- Tsunami and seiche
- Volcanic hazards
- Expansive soils
- Radon
- Naturally occurring asbestos
- Hydrocollapse
- Regional subsidence

4.3 SITE PREPARATION AND GRADING

4.3.1 Stripping

Prior to general site grading and/or construction of planned improvements, debris and deleterious materials, where present, should be stripped and disposed of off-site or outside the construction limits. Stripping depths of about 2 to 5 inches should be anticipated for the project. In areas where trees and dense shrubs might have been present prior to the site development or are removed for the project, root balls and concentrations of organic materials could be encountered. If those materials are exposed, we recommend that they be stripped and removed from the project site prior to engineered fill placement or construction of project improvements. Any voids created by removal of roots, debris, and/or deleterious materials should be filled using engineered fill materials described in Section 4.3.11 and/or 4.3.12, and placed according to recommendation made in Section 4.3.15 unless those areas are within proposed cut slopes and will be removed in their entirety during grading.

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4.3.2 Existing Utilities, Wells, and/or Foundations

Buried utilities are present throughout the project area. When subsurface utilities are encountered during construction, they should be removed and/or rerouted beyond construction limits. Buried tanks or wells, if present, should be removed in compliance with applicable regulatory agency requirements. Existing, below-grade utility pipelines that extend beyond the limits of the proposed construction and that will be abandoned in-place should be plugged with lean concrete or grout to prevent migration of soil and/or water. All excavations resulting from removal and demolition activities should be cleaned of loose or disturbed material prior to placing any fill or backfill.

4.3.3 Overexcavation

Overexcavation, as discussed herein, applies to those areas that contain debris, deleterious materials, concentrations of organics, and uncertified artificial fill materials. Specifically, based on the layout of improvements noted on the Proposed Site Plan (NMR, 2014), it appears that the western edge of the proposed Barracks, and the proposed Pump/Generator/Storage building, 10,000-gallon water tank, and 20,000-gallon water tank will be underlain by uncertified artificial fill materials that were observed to be relatively loose in explorations advanced for this study. If revisions to the site plan result in additional structures situated over uncertified fill materials, those areas should also be included for overexcavation.

In addition, portions of the proposed site paving could be underlain by unstable (not firm) and yielding artificial fill materials. If those materials cannot be stabilized and compacted according to recommendations made in Section 4.8 of this report, they could require overexcavation.

We recommend that those areas be overexcavated vertically down to competent natural soils and horizontally a minimum of five feet outside of the outside face of the exterior foundation system for those improvements. Once overexcavation has been performed, a CGI engineer or geologist should be allowed to observe and approve the extent and depth of overexcavation prior to placement of engineered fill. Engineered fill used to fill the overexcavation should be placed according to recommendations made in Section 4.3.15 of this report.

4.3.4 Keying and Benching

The development area is gently inclined downward in all directions from the top of the knoll. The gradients of the slopes are sufficiently flat that establishment of keyways is not anticipated to be necessary for the placement of engineered fill materials. Benching, however, should occur into the native soils to expose competent subgrade on which to place fill materials. The benches should be at least 8 feet wide. The areas to receive fill materials should be prepared in accordance with Sections 4.3 of this report.

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4.3.5 Scarification and Compaction

Following site stripping and overexcavation, areas to receive engineered fill should be scarified to a minimum depth of 8 inches, uniformly moisture-conditioned to near optimum moisture content, and compacted to at least 90 percent of the maximum dry density as determined using standard test method ASTM D1557[1].

4.3.6 Wet/Unstable Soil Conditions

On-site soils encountered during grading may be significantly over optimum moisture content, depending on when construction is performed. These conditions could hinder equipment access as well as efforts to compact site soils to a specified level of compaction. If over optimum soil moisture content conditions are encountered during construction, disking to aerate, replacement with imported material, chemical treatment, stabilization with a geotextile fabric or grid, and/or other methods will likely be required to facilitate earthwork operations. The applicable method of stabilization is the Contractor's responsibility and will depend on the contractor's capabilities and experience, as well as other project-related factors beyond the scope of this investigation. Therefore, if over-optimum moisture within the soil is encountered during construction, CGI should review these conditions (as well as the Contractor's capabilities) and, if requested, provide recommendations for their treatment.

4.3.7 Site Drainage

Grading should be performed in such a manner that provides positive surface gradient away from all structures for a minimum distance of at least 10 feet. The ponding of water should not be allowed adjacent to structures or retaining walls. Surface runoff should be directed toward engineered collection systems or suitable discharge areas and not allowed to flow over slopes. Discharge from structures should also be collected in solid (unperforated) pipelines, conveyed, and discharged away into engineered systems, such as storm drains. Landscape plantings around structures should be avoided or be dry climate tolerant and require minimal irrigation.

4.3.8 Excavation Characteristics

The development area is underlain by medium stiff to stiff or medium dense to very dense alluvial soils to the depths explored. Those materials were penetrated with slight to moderate difficulty using a Mobile Drill B59 drill rig equipped with 8.25-inch diameter hollow-stem augers. The most difficult drilling conditions occurred where zones of moderate to abundant gravels and cobbles were encountered. In addition, backhoe test pits were excavated using a Caterpillar 430D backhoe equipped with a two-foot wide bucket. All test pits were excavated with slight to moderate difficulty with the exception of test pits TP-5, TP-7, TP-8, TP-9, and TP-10. In those test pits, harder excavation characteristics were present.

[1] This test procedure applies wherever relative compaction, maximum dry density, or optimum moisture content is referenced within this report.

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Based upon our observations and experience with similar soils, it is our opinion that the underlying soils should be excavatable using conventional heavy grading equipment. Blasting, hoe-ramming, rock sawing, and other alternative excavation measures are not anticipated to be needed to penetrate to the depth of the proposed construction.

4.3.9 Temporary Slopes

This section explicitly excludes trench slopes for buried utilities. Temporary trench excavations are discussed in Section 4.6.1 of this report.

All temporary excavations must comply with applicable local, state, and federal safety regulations, including the current OSHA Excavation and Trench Safety Standards. Construction site safety is the responsibility of the Contractor, who should be solely responsible for the means, methods, and sequencing of construction operations so that a safe working environment is maintained.

Soil materials encountered at the site conform most closely to Type "B" soils defined within the OSHA Technical Manual (1999). Under OSHA guidelines, temporary construction slopes up to 20 feet tall can be constructed at inclination of up to 45 degrees for Type "B" soils. If groundwater is exposed within the temporary slope, then flatter slopes may be needed or shoring might be necessary to maintain a safe work area and stable temporary slopes. If possible, we recommend that temporary slopes in excess of 15 feet in height be exposed only during seasonal dry times of year and not be allowed to remain exposed between November and March.

Heavy construction equipment, building materials, excavated soil, and vehicular traffic should not be allowed within a 1:1 (horizontal to vertical) projection from the toe of the excavation to the ground surface, unless shoring is being used and has specifically been designed for those surcharge loads. Where the stability of adjoining improvements, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning may be required to provide structural stability and to protect personnel working within the excavation.

During wet weather, earthen berms or other methods should be used to prevent runoff water from entering excavations. All runoff water entering the excavation(s) should be collected and disposed of outside the construction limits.

4.3.10 Permanent Slopes & Setbacks

Permanent slopes proposed for the project should not exceed 2:1 (horizontal:vertical) inclinations. If proposed unsupported cut slopes require excavation or construction at inclinations steeper than 2:1 then CGI should be consulted to evaluate the maximum

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permanent slope angle that provides a minimum static and pseudostatic factor of safety of 1.5 and 1.1, respectively.

In order to comply with CBC regulations, minimum setbacks for proposed structures should be equivalent to the height of the slope divided by 3, but need not exceed 40 feet. If the desired setbacks are less than these requirements, then the foundations of the structures should be deepened or opt for alternate setbacks in accordance with requirements of section 1805.3.5 of 2013 CBC.

4.3.11 **On-Site Soil Materials**

It is our opinion that most of the near-surface soils encountered at the site can be used for general engineered fill provided they are free of organics, debris, oversized particles (>3") and deleterious materials. Gravel and aggregate base materials free of debris, organics, and deleterious materials are also acceptable for use within general engineered fill. If highly plastic clayey materials (materials having a plasticity index exceeding 30 and a liquid limit in excess of 50) are encountered during grading, those materials should be segregated and excluded from engineered fill, where possible. It should be noted that many of those soils will be above optimum moisture content and could require moisture conditioning during grading operations to achieve the minimum specified relative compaction. If potentially unsuitable soil is considered for use as engineered fill, CGI should observe, test, and provide recommendations as to the suitability of the material prior to placement as engineered fill.

4.3.12 **Imported Fill Materials - General**

If imported fill materials are used for this project, they should consist of soil and/or soil-aggregate mixtures generally less than 3 inches in maximum dimension, nearly free of organic or other deleterious debris, and essentially non-plastic. Typically, well-graded mixtures of gravel, sand, non-plastic silt, and small quantities of clay are acceptable for use as imported engineered fill within foundation areas. Imported fill materials should be sampled, tested, and approved prior to importation to the project site and with sufficient laboratory lead time (three working days) to verify that those materials meet recommended material criteria noted below. Specific recommendations for imported fill materials, as well as applicable test procedures to verify material suitability, are as follows:

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IMPORTED FILL RECOMMENDATIONS				
GRADATION				
Sieve Size	General Fill	Granular Fill	Test Procedures	
	Percent Passing		ASTM	AASHTO
3-inch	100	100	D422	T88
¾-inch	70 – 100	70 – 100	D422	T88
No. 200	0 - 30	<5	D422	T88
PLASTICITY				
Liquid Limit	<30	NA	D4318	T89
Plasticity Index	<12	Nonplastic	D4318	T90
ORGANIC CONTENT	<3%	<3%	D2974	NA

4.3.13 Materials - Granular

All granular fill should consist of imported soil mixtures generally less than 3 inches in maximum dimension, nearly free of organic or other deleterious debris, and essentially non-plastic. Specific requirements for granular fill, as well as applicable test procedures to verify material suitability are presented in Section 4.3.12 of this report.

4.3.14 Controlled Low Strength Material

Controlled low strength material (CLSM) can be used to backfill excavated areas or as engineered fill materials. CLSM consists of a fluid, workable mixture of aggregate, cement, and water that is of limited strength as to allow future excavation and maintenance of buried improvements yet capable of supporting the proposed improvements. If CLSM is used as engineered fill materials, we recommend that those materials conform and be placed according to specifications presented in Section 19-3 of the 2010 Caltrans Standard Specifications.

4.3.15 Placement & Compaction

Soil and/or soil-aggregate mixtures used for engineered fill should be uniformly moisture-conditioned to within 3 percent of optimum moisture content, placed in horizontal lifts less than 8 inches in loose thickness, and compacted to at least 90 percent relative compaction. More specific recommendations are made for structural pavement sections (see Section 4.8 of this report).

It is recommended that fill materials be placed and compacted uniformly in elevation around the buried structures and that the vertical elevation differential of contiguous lifts diverge no more than three feet around the structure during compaction. Testing should be performed to verify that the relative compactions are being obtained as recommended herein. Compaction testing, at a minimum, should be performed at the following frequencies:

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RECOMMENDED COMPACTION TEST FREQUENCY		
Type of Engineered Fill	**Maximum Volume Frequency**	**Maximum Vertical Interval**
General Engineered Fill	1 per 200 yd^3	1 per 1.5 feet
Structural Backfill	1 per 50 yd^3	1 per 1.0 feet
See Section 4.6 and 4.8 for trench backfill and pavement section testing frequencies.		

The testing should occur at whichever threshold comes first.

In general, a "sheep's foot" or "wedge foot" compactor should be used to compact fine-grained fill materials. A vibrating smooth drum roller could be used to compact granular fill materials and final fill surfaces.

4.4 FOUNDATIONS & SLABS

4.4.1 Summary of Foundation Design Recommendations

The following table provides a summary of foundation design recommendations made in Section 4.4.

FOUNDATION DESIGN RECOMMENDATION SUMMARY	
Foundation Element	**Recommended Value**
Shallow Foundation System (Spread Footings)	
Anticipated foundation materials:	Alluvium
Minimum embedment depth:	18 inches
Allowable bearing capacity, First Floor:	2,000 psf
Allowable bearing capacity increase with depth:	200 psf/ft
Maximum allowable bearing capacity:	3,500 psf
Passive Pressure & Coefficient of Friction	
Passive pressure:	200 pcf
Base coefficient of friction:	0.30 or 0.35
Estimated Settlement	
Total:	<1"
Differential:	1/2 " in 20 ft
Slab-on-Grade	
Modulus of subgrade reaction (K_{1s})	100 pci

4.4.2 Transition Lots

We recommend that the structure foundations be founded entirely within native, undisturbed soils. Grading plans and building elevations showing finish floor elevations were not available at the time this report was prepared. However, based on the Proposed Site Plan developed by NMR (2014), it appears that the proposed barracks, Pump/Generator/Storage Building, and proposed 10,000- and 20,000-gallon water tanks

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could be situated such that foundations will rest on both undisturbed natural soils and engineered fill materials (heretofore called a 'transition lot'). The remainder of the structures, based on review of Proposed Site Plan (NMR, 2014), appear to be situated entirely on undisturbed natural soils.

Because some of the structures will be situated on transition lots, there is a potential for adverse deformation due to differential settlement (the undisturbed natural soils will settle at a different rate and magnitude than the engineered fill materials) unless mitigation measures are design and constructed that will reduce the potential for differential settlement to occur. **For this project, we recommend that the foundations in those portions of the buildings/structures/tanks underlain by engineered fill materials be deepened so that they are constructed a minimum of 18 inches into undisturbed natural soils underlying the site**. It is anticipated that engineered fill thicknesses will be less than 5 feet so that deepened foundations is likely the most cost effective means of mitigation. In this manner, the entire structure foundations should be supported by undisturbed Red Bluff Formation underlying the site. If fill thicknesses exceed 5 feet then cast-in-drill-hole (CIDH) piles supporting grade beams could be another viable alternative to mitigate the risk of differential settlement in those areas of the structures underlain by engineered fill.

4.4.3 Shallow Foundations

Foundations must be sized, embedded, and reinforced in accordance with recommendation made by the project structural engineer. All foundation excavations should be made level, with the exception of vertical steps. The allowable bearing pressures provided in Section 4.4.4 below are based on a recommended minimum embedment depth of 18 inches below the graded engineered fill surface and a minimum width of 18 inches. Footing thicknesses should be determined by the Structural Engineer.

4.4.4 Allowable Bearing Pressures

It is assumed that all foundations for the proposed structures, with the exception of isolated foundations for items such as light standards, will rest entirely on undisturbed natural soils as discussed in Section 4.4.2, above. In general, soils at the site conform to Class of Materials Type 4 in accordance with Table 1806.2 of the 2013 CBC.

Isolated and continuous footing elements should be proportioned for dead loads plus probable maximum live load, and a maximum allowable bearing pressure of 2,000 pounds per square foot (psf) for all footings. The allowable bearing capacity can be increased by 200 psf for every additional foot of embedment beneath the minimum specified CBC foundation depth, up to a maximum allowable bearing capacity of 3,500 psf.

The allowable bearing pressures provided are net values. Therefore, the weight of the foundation (which extends below finished subgrade) may be neglected when computing dead loads. The allowable bearing pressure applies to dead plus live loads and includes a

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calculated factor of safety of at least 3. An increase of allowable bearing pressure by one-third for short-term loading due to wind or seismic forces should NOT be incorporated unless an alternative load combination, as described in Section 1605.3.2 of the 2013 CBC, is applied. The allowable bearing value is for vertical loads only; eccentric loads may require adjustment to the values recommended above. We recommend that CGI be allowed to observe foundation excavations to confirm projected site conditions.

4.4.5 Estimated Settlements

The anticipated total settlement for structure foundations, if construction occurs as recommended within this report, should be less than one inch. Differential settlement for the structure foundations is anticipated to be less than ½-inch in 20 feet.

4.4.6 Slab-on-Grade Design

All ground-supported slabs should be designed by a Civil Engineer to support the anticipated loading conditions. Reinforcement for slabs should be designed by a Civil Engineer to maintain structural integrity, and should not be less than that required to meet pertinent code, shrinkage, and temperature requirements. Reinforcement should be placed at mid-thickness in the slab with provisions to ensure it stays in that position during construction and concrete placement.

The mat can be designed using a flat slab on an elastic half-space analog. A modulus of subgrade reaction (k_{s1}) of 100 pounds per cubic inch (pci) is recommended for design of mat-type foundations. That modulus of subgrade reaction value represents a presumptive value based on soil classification. No plate-load tests were performed as part of this study. The modulus value is for a 1-foot-square plate and must be corrected for mat size and shape, assuming a cohesionless subgrade.

Subgrade soils supporting interior concrete floor slabs should be scarified to a minimum depth of 8 inches, uniformly moisture-conditioned to near the optimum moisture content, and compacted to at least 90 percent relative compaction.

Due to relatively shallow groundwater beneath the project site, we recommend that measures to reduce moisture intrusion through the basement and Sallyport slabs-on-grade be included within the project design to reduce the potential for damage to occur to floor coverings, wall treatments, and floor-mounted equipment, and the development of mold.

4.4.7 Rock Capillary Break/Vapor Barrier

Interior concrete floor slabs supported-on-grade should be underlain by a capillary break consisting of a blanket of compacted, free-draining, durable rock at least 4 inches thick, graded such that 100 percent passes the 1-inch sieve and less than 5 percent passes the No. 4 sieve.[2] Furthermore, a vapor barrier should be placed beneath all interior concrete floor slabs

[2] In general, Caltrans Class 2 aggregate base (or similar material) does not meet the requirements provided

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supported-on-grade that will be covered with moisture-sensitive equipment or floor coverings. This barrier may consist of a plastic or vinyl membrane placed directly over the rock capillary break. The vapor barrier should be sealed around all penetrations, including utilities. If a vapor barrier is not installed, there is a risk of moisture vapors and salts penetrating the slab-on-grade. For this project, equipment and flooring materials on slabs-on-grade are unknown. It is our recommendation that American Concrete Institute (ACI) guidelines ACI 302 and ACI 360 be referred to regarding installation of vapor barriers based on the anticipated flooring materials to be installed.

A capillary break and/or vapor barrier may not be required for some types of construction (such as equipment buildings, warehouses, garages, and other uninhabited structures insensitive to water intrusion and/or vapor transmission through the slab). For these types of structures, the gravel capillary break and/or vapor barrier recommended above may be omitted and the slab placed directly on the prepared subgrade or other approved surface if it is determined by the civil engineer and architect that water vapors will not adversely affect improvements or equipment resting on the slab-on-grade. In the event a capillary break and/or vapor barrier is not to be used, CGI should review the planned structure in order to assess the applicability of the approach and provide (if necessary) additional recommendations regarding subgrade preparation and/or support.

4.4.8 Lateral Earth Pressures

It is our understanding that buried structures and retaining walls (heretofore referred to as retaining walls) are likely not to be utilized in this project. However, in the event that such improvements are needed, we have provided the following recommendations.

Retaining walls, including buried concrete tank walls, should be designed to resist earth pressures exerted by the retained, compacted backfill plus any additional lateral force that will be applied to the wall due to surface loads placed at or near the wall. The recommended equivalent fluid weights presented below are for static (non-earthquake) conditions.

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above for a capillary break. Therefore, we recommend this material not be used for a capillary break beneath interior concrete slabs supported-on-grade.

LATERAL EARTH PRESSURES UNDER STATIC CONDITIONS		
Lateral Earth Pressure Condition	**Slope Inclination Above Retaining Structure**	**Equivalent Fluid Weight (pcf)**
		Drained
At-Rest	Flat	65
Active	Flat	50
At-Rest	2:1	85
Active	2:1	70

The resultant force of the static lateral force prism should be applied at a distance of 33 percent of the wall height above the soil elevation on the toe side of the wall.

The tabulated values are based on a soil unit weight of 125 pounds per cubic foot (pcf), and do not provide for surcharge conditions resulting from construction materials, equipment, or vehicle traffic. Loads not considered as surcharges should bear behind a 1:1 (horizontal to vertical) line projected upward from the base of the shoring. If surcharges are expected, CGI should be advised so that we can provide additional recommendations as needed. Surcharge loads induce additional pressures on earth retaining structures. An additional lateral load on non-yielding walls equal to 0.5 times the applied surcharge pressure should be included in the design for uniform area surcharge pressures. Lateral pressures for other surcharge loading conditions can be provided, if required.

Ultimate sliding resistance, passive pressures, and safety factors are discussed below in Section 4.4.9 through 4.4.11, respectively.

4.4.9 Sliding Resistance

Ultimate sliding resistance generated through a compacted soil/concrete interface can be computed by:

- Multiplying the soil/concrete adhesion (130 psf for artificial fill) by the footing contact area for cohesive soils. In no case should the lateral sliding resistance exceed one-half the dead load; or
- Multiplying the total dead weight structural loads by the friction coefficient of 0.30 for fine-grained alluvial soils and 0.35 for imported and native granular engineered fill.

4.4.10 Passive Resistance

Ultimate passive resistance developed from lateral bearing of shallow foundation elements bearing against compacted soil surfaces for that portion of the foundation element extending below a depth of 1 foot below the lowest adjacent grade can be estimated using an equivalent fluid weight of 200 pcf.

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4.4.11 Safety Factors

Sliding resistance and passive pressure may be used together without reduction in conjunction with recommended safety factors outlined below. A minimum factor of safety of 1.5 is recommended for foundation sliding, where sliding resistance and passive pressure are used together.

4.4.12 Frost Penetration

According to Tehama County (2014), the project site is located within California Climate Zone 11 and includes frost penetration to depths of 18 inches. We recommend that all project foundations be designed and constructed no shallower than 12 inches.

4.4.13 Construction Considerations

Prior to placing steel or concrete, foundation excavations should be cleaned of all debris, loose or disturbed soil, and any water. A representative of CGI should observe all foundation excavations prior to concrete placement.

4.5 RETAINING WALLS

4.5.1 Summary of Retaining Wall Recommendations

The following table provides a summary of retaining wall and retainage improvement recommendations.

RETAINAGE DESIGN RECOMMENDATIONS		
Foundation Element		**Recommended Value**
Shallow Foundation System (Spread Footings)		
	Anticipated foundation materials:	Alluvium & Engineered Fill
	Minimum embedment depth:	18 inches
	Allowable bearing capacity:	2,000 psf
	Allowable bearing capacity increase with depth:	200 psf/ft
	Maximum allowable bearing capacity:	3,500 psf
Lateral Earth Pressures		
Colluvium/ Artificial Fill	At-rest (level ground above):	65 pcf
	Active (level ground above):	50 pcf
	At-rest (2:1 slope above):	85 pcf
	Active (2:1 slope above):	70 pcf
	Dynamic (seismic) forces:	See Section 4.5.4

We recommend that the above recommendations be utilized following review of Section 4.4.9 and 4.5 of this report, which contain additional details

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4.5.2 Lateral Earth Pressures

If retaining walls are utilized in this project, they should be designed to resist earth pressures exerted by the retained, compacted backfill plus any additional lateral force that will be applied to the wall due to surface loads placed at or near the wall. The recommended equivalent fluid weights are presented in section 4.4.8 of this report.

Surcharge loads induce additional pressures on earth retaining structures. An additional lateral load on non-yielding walls equal to 0.5 times the applied surcharge pressure should be included in the design for uniform area surcharge pressures. Lateral pressures for other surcharge loading conditions can be provided, if required.

4.5.3 Drainage Measures

Drainage measures should be constructed behind the proposed retaining walls, including basement walls, to reduce the potential for groundwater accumulation and moisture intrusion. To help reduce the potential for the buildup of hydrostatic forces behind walls, a granular free-draining backfill, at least 2 feet thick, should be placed behind the wall, as shown on Plate 9 – Retaining Wall Details. The two-foot thick layer can be decreased to one foot in thickness if wrapped with a geosynthetic filter fabric; however, the structural engineer should be consulted to confirm that the retaining wall is design to withstand potential increased stresses due to compaction closer to the wall. The free-draining backfill should consist of clean, coarse-grained material with no more than 5 percent passing the No. 200 sieve. Acceptable backfill would be:

- Pervious Backfill conforming to Item 300-3.5.2 of the *Standard Specifications for Public Works Construction* (Greenbook), most current edition;
- Permeable Material (Class 2) conforming to Item 68-1.025 if the *Caltrans Standard Specifications*, most current edition;
- Pea gravel having a nominal diameter or ¼-inch; or
- Crushed stone sized between ¼-inch and ½-inch.

In lieu of free-draining backfill materials of the types suggested above, manufactured (geosynthetic) drainage systems (for example MiraDrain manufactured by TC Mirafi, Inc., or equivalent) can be used against retaining or below-grade walls. Manufacturer recommendations for the installation and maintenance of these products should generally be followed, although they should be reviewed by CGI for approval. In addition, manufactured drainage systems should be attached to the retaining wall face as opposed to the excavated slope face. This implies that provisions to protect the integrity of the drainage panels will need to be made while fill materials are placed behind the walls.

A perforated drainpipe system should be installed at the base of the wall to collect water from the free-draining material and/or geosynthetic drainage system. The drainpipe system should allow gravity drainage of the collected water away from the buried wall or, as a less

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preferred option, should be tied into a sump and pump system to remove the water to an acceptable outlet facility.

Finish surface grades should be sloped away from the retaining walls and designed to channel water to an acceptable collection and offsite disposal system. Provisions should be included for removal of surface runoff that may tend to collect behind the backs of walls and for drainage of water away from the fronts of walls. Also, provisions should be included to mitigate the infiltration of surface water into the below-ground, free-draining backfill/geosynthetic drainage system by placing a minimum of 18-inches of low permeability compacted soil over the top of those materials.

The recommendations noted above are solely intended to reduce hydrostatic pressures acting on the retaining wall and not specifically to reduce the potential of moisture intrusion through the walls. In areas where moisture intrusion through retaining walls is undesirable, we recommend that measure be incorporate into the project design that will reduce the potential for moisture intrusion to occur.

4.5.4 Dynamic Earth Pressures

For unrestrained walls, the increase in lateral earth pressure acting on the wall resulting from earthquake loading can be estimated using the approach of Seed and Whitman (1970). That theory is based on the assumption that sufficient wall movement occurs during seismic shaking to allow active earth pressure conditions to develop. For restrained walls, the increase in lateral earth pressure resulting from earthquake loading also can be estimated using these relations. Because that theory is based on the assumption that sufficient movement occurs so that active earth pressure conditions develop during seismic shaking, the applicability of the theory to restrained or basement walls is not direct; however, there have been studies (Nadim and Whitman, 1992) that suggest the theory can be used for such walls.

In the Seed and Whitman (1970) approach, the total dynamic pressure can be divided into static and dynamic components. The estimated dynamic lateral force increase (based on seismic loading conditions) for either unrestrained or restrained walls, could be taken as the following:

$$P_E = 3/8 * K_h * \gamma_t * H^2$$

Where:

P_E	=	Seismically-induced horizontal force (lbs. per lineal foot of wall)
K_h	=	Horizontal ground acceleration divided by gravitational acceleration (K_h = PGA/g)
γ_t	=	Total unit weight of backfill (pcf)
H	=	Height of the wall below the ground surface (ft.)

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Peak ground acceleration (pga) values for the site are provided in Section 3.1 of this report. The centroid of the dynamic lateral force increment should be applied at a distance of 0.6*H above the base of the wall.

To estimate the total dynamic lateral force, the dynamic lateral force increase should be added to the static earth pressure force computed using recommendations for active lateral earth pressures presented above. That recommendation is based on the concept that during shaking, earth pressures recommended for permanent conditions will be reduced to those more closely approximating active conditions.

4.6 PIPELINES & TRENCH BACKFILL

4.6.1 Trenches and Dewatering

Utility trenches greater than 5 feet deep should be braced or shored in accordance with good construction practices and all applicable safety ordinances. In general, some granular soils that could have a tendency to run or flow were observed during our study and could be encountered within trench excavations. There is also a potential that shallow unshored trenches excavated with sidewalls steeper than 1:1 could locally cave. The actual construction of the trench walls and worker safety is the sole responsibility of the Contractor.

Heavy construction equipment, building materials, excavated soil, and vehicular traffic should not be allowed within a 1:1 (horizontal to vertical) projection from the toe of the trench excavation to the ground surface. Where the stability of adjoining buildings, walls, buried utilities within the trench sidewalls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning may be required to provide structural stability and to protect personnel working within the excavation.

Seasonal, perched groundwater might be encountered within the depths of typical trench excavations and could enter utility trenches excavated for this project. If groundwater is encountered during construction, it is recommended that the contractor install measures to capture and/or divert groundwater from entering the excavation. If this is not possible, then the contractor should channel groundwater to flow towards collection points to be removed from the trench and disposed of at an approved area.

4.6.2 Materials

Pipe zone and trench zone nomenclature used within this study are illustrated on Plate 10 – Trench Nomenclature. Pipe zone backfill (i.e., material placed from the trench bottom to a minimum of 6 inches over the pipeline crown) should consist of imported soil having a Sand Equivalent (SE) of no less than 30 and having a particle size no greater than ½-inch in maximum dimension. On site soils will likely not meet this recommendation. Trench zone

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backfill (i.e., material placed between the pipe zone backfill and finished subgrade) may consist of on-site soil that meets the material requirements previously provided for engineered fill with 100 percent passing the ¾-inch sieve.

Recommendations provided above for pipe zone backfill are minimum requirements only. More stringent material specifications may be required to fulfill local codes and/or bedding requirements for specific types of pipe. We recommend the project Civil Engineer develop these material specifications based on planned pipe types, bedding conditions, and other factors beyond the scope of this investigation.

4.6.3 Placement and Compaction

Backfill in temporary excavations should be placed and compacted in accordance with recommendations previously provided for engineered fill. Mechanical compaction is strongly recommended; ponding or jetting should not be allowed. Compaction tests should be performed at no more than 200-foot horizontal intervals and 1.5-foot vertical intervals for pipezone and trench zone backfill. Special care should be given to ensuring that adequate compaction is made beneath the haunches of utility pipes (that area from the pipe springline to the pipe invert) and that no voids remain in this space.

4.6.4 Trench Subgrade Stabilization

Soft and yielding trench subgrade could be encountered along the bottom of trench excavations. It is recommended that the bottom of trenches be stabilized prior to placement of the pipeline bedding so that, in the judgment of the geotechnical engineer, the trench subgrade is firm and unyielding. The Contractor should have the sole responsibility for design and implementation of trench subgrade stabilization techniques. Some methods that we have observed used to stabilize trench subgrades include the following:

- Use of ¾–inch to 1½-inch floatrock worked into the trench bottom and covered with a geotextile fabric such as Mirafi 500X;
- Placement of a geotextile fabric, such as Mirafi 500X, on the trench bottom and covered with at least one foot of compacted processed miscellaneous base (PMB) conforming to the requirements of Section 200-2.5 of the Greenbook, latest edition;
- Overexcavation of trench subgrade and placement of two-sack sand-cement slurry; and
- In extreme conditions, injection grouting along the trench alignment.

If floatrock is used, typically sand with an SE of 50 or more should be used to fill the voids in the rock prior to placement of pipe bedding materials.

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4.7 SHORING CONSIDERATIONS

Shoring systems that are utilized in this project should be designed to resist earth pressures exerted by the retained soils plus any additional lateral force that will be applied to the shoring due to surface loads placed at or near the excavation. Retaining systems that are free to rotate or translate laterally (for example, cantilevered retaining walls) through a horizontal distance to shoring height ratio of no less than 0.004 are referred to as unrestrained or yielding retaining structures. Such shoring systems can generally move enough to develop active conditions. Retaining systems that are unable to rotate or deflect laterally (for example, restrained basement walls) are referred to as restrained or non-yielding. If such shoring systems cannot move or translate very much, then at-rest conditions develop.

Recommended equivalent fluid weights for active and at-rest conditions are presented in Section 4.4.8.

4.8 PAVEMENT DESIGN

4.8.1 R-Values

One R-value test was performed on a selected sample of on-site soils. Results of that test reported an R-value of 24. Because soil materials vary across a project site, we recommend that confirmatory R-value tests be obtained during construction. If construction R-values are significantly different than the R-value used, then the pavement design can be modified at that time to reflect the constructed conditions.

4.8.2 Subgrade Preparation

All subgrade soils should be scarified to a minimum depth of 1-foot, moisture conditioned as necessary to near optimum moisture conditions and compacted to a minimum of 95 percent of the maximum dry density as determined by AASHTO (American Association of State Highway and Transportation Officials) Test Method T-180. Density testing should be performed prior to placement of the aggregate base materials. Prior to performing density tests, we recommend that the subgrade be bladed smooth with all loose soils removed, and be proof rolled with a loaded water truck, dump truck, or other suitably heavy piece of construction equipment deemed acceptable by the technician performing the proof rolling observations. Those areas found to not be firm and unyielding should be mitigated until they are firm and unyielding. Density tests should then be performed at a frequency of at least one test per 500 ft^2 of subgrade area.

Concrete curbs and landscape planters that border pavement sections should be embedded into the subgrade soils a minimum of 2 inches to reduce the migration of meteoric and irrigation water into the pavement section.

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4.8.3 *Aggregate Base*

The aggregate base (AB) should be of such quality as to meet or exceed Caltrans specifications for Class 2 AB and should have a minimum R-value of 78. The AB should be spread in thin lifts restricted to 8 inches in loose thickness or less, moisture conditioned as necessary to near optimum moisture content and compacted to a minimum of 95 percent of the maximum dry density as determined by AASHTO T-180. Density testing should be performed prior to placement of the asphalt paving. Prior to performing density tests, we recommend that the aggregate base materials be proof rolled with a loaded water truck, dump truck, or other suitably heavy piece of construction equipment deemed acceptable by the technician performing the proof rolling observations. Those areas found to not be firm and unyielding should be mitigated until they are firm and unyielding. Density tests should then be performed at a frequency of at least one test per 500 ft^2 of aggregate base area.

4.8.4 *Asphalt Concrete Paving*

An R-value of 24 was used for this study. To provide recommendations for structural pavement sections, we evaluated design criteria for TIs ranging from 4.0 to 10.0. Using those criteria, we have prepared AC structural pavement section recommendations. Recommendations for full depth AC, and AC and AB sections are provided in the following table:

MINIMUM RECOMMENDED STRUCTURAL PAVEMENT SECTIONS[1]

Section	Traffic Index	Type B AC Thickness (in)	Class 2 AB Thickness (in)
Full Depth AC	4.0	5.0	- - -
	5.0	6.5	- - -
	6.0	8.0	- - -
	7.0	9.0	- - -
	8.0	10.0	- - -
	9.0	11.5	- - -
	10.0	12.5	- - -
AC and AB	4.0	2.0	6.0
	5.0	2.5	8.0
	6.0	3.0	9.5
	7.0	4.0	10.5
	8.0	4.8	12.5
	9.0	5.5	14.5
	10.0	6.0	17.0

[1] –Based on Caltrans Highway Design Manual, Topic 608.8

Asphalt paving materials and equipment should meet or exceed current Caltrans specifications.

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5 ADDITIONAL SERVICES

This report and its associated recommendations were intended to assist the project team during design stages of the project. We recommend that as the project becomes better defined that CGI be given the opportunity to collaborate on the project refinements and review project plans and specifications so that: 1) we can confirm that project design conforms with recommendations made, herein; and 2) preliminary recommendations made within this report can be refined, where necessary, based on the design elements of the project.

6 LIMITATIONS

This report has been prepared in substantial accordance with the generally accepted geotechnical engineering practice, as it existed in the site area at the time our services were rendered. No other warranty, either express or implied, is made. The recommendations provided in this report are based on the assumption that an adequate program of tests and observations will be conducted during the construction phase in order to evaluate compliance with our recommendations.

Conclusions and recommendations contained in this report were based on the conditions encountered during our evaluation of geologic hazards at the site and our field investigation and are applicable only to those project features described herein (see Section 1.2 – Project Understanding). Soil and rock deposits can vary in type, strength, and other geotechnical properties between points of observation and exploration. Additionally, groundwater and soil moisture conditions can also vary seasonally and for other reasons. Therefore, we do not and cannot have a complete knowledge of the subsurface conditions underlying the project site. The conclusions and recommendations presented in this report are based upon the findings at the points of exploration, and interpolation and extrapolation of information between and beyond the points of observation, and are subject to confirmation based on the conditions revealed by construction.

The scope of services provided by CGI for this project did not include the investigation and/or evaluation of toxic substances, or soil or groundwater contamination of any type. If such conditions are encountered during site development, additional studies may be required. Further, services provided by CGI for this project did not include the evaluation of the presence of critical environmental habitats or culturally sensitive areas.

This report may be used only by our client and their agents and only for the purposes stated herein, within a reasonable time from its issuance. Land use, site conditions, and other factors may change over time that may require additional studies. In the event significant time elapses between the issuance date of this report and construction, CGI shall be notified of such occurrence in order to review current conditions. Depending on that review, CGI

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may require that additional studies be conducted and that an updated or revised report is issued.

Any party other than our client who wishes to use all or any portion of this report shall notify CGI of such intended use. Based on the intended use as well as other site-related factors, CGI may require that additional studies be conducted and that an updated or revised report be issued. Failure to comply with any of the requirements outlined above by the client or any other party shall release CGI from any liability arising from the unauthorized use of this report.

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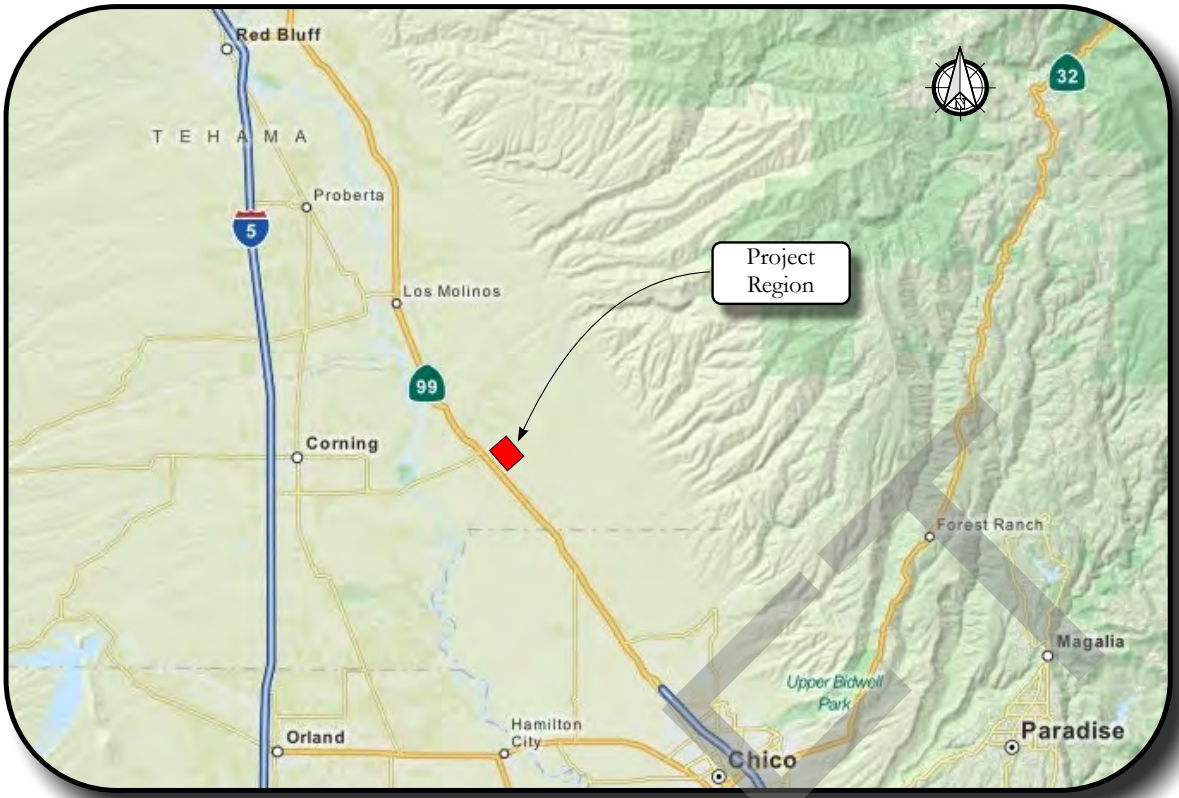

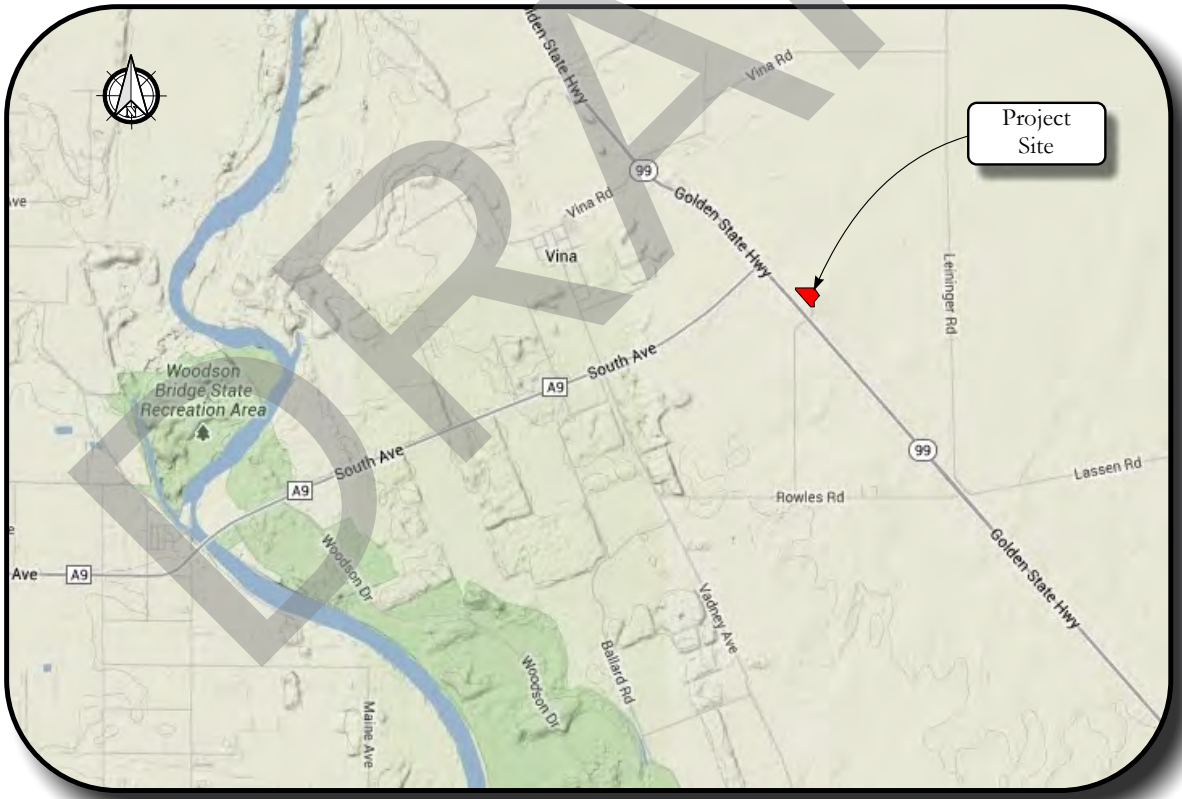

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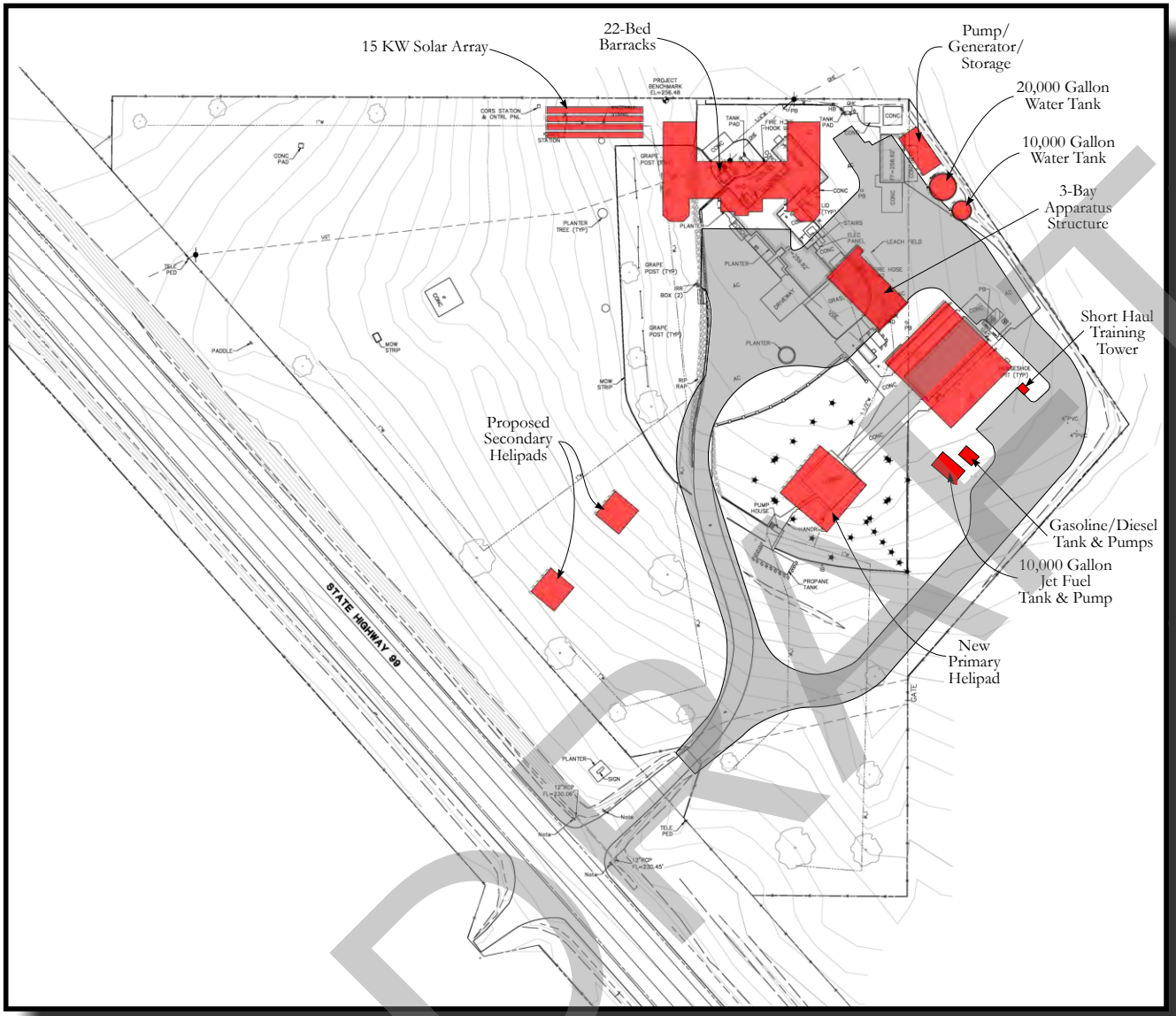
SITE LOCATION MAP
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate

1



Scale not Determined

Proposed Structure/Tank Improvement

Proposed Access Road/ Parking Areas

Improvement locations based on Proposed Site Plan 'Scheme A' prepared by Nichols Melburg & Rossetto dated 1-27-14
Topographic base map obtained from Omni·Means, Ltd on February 10, 2014.

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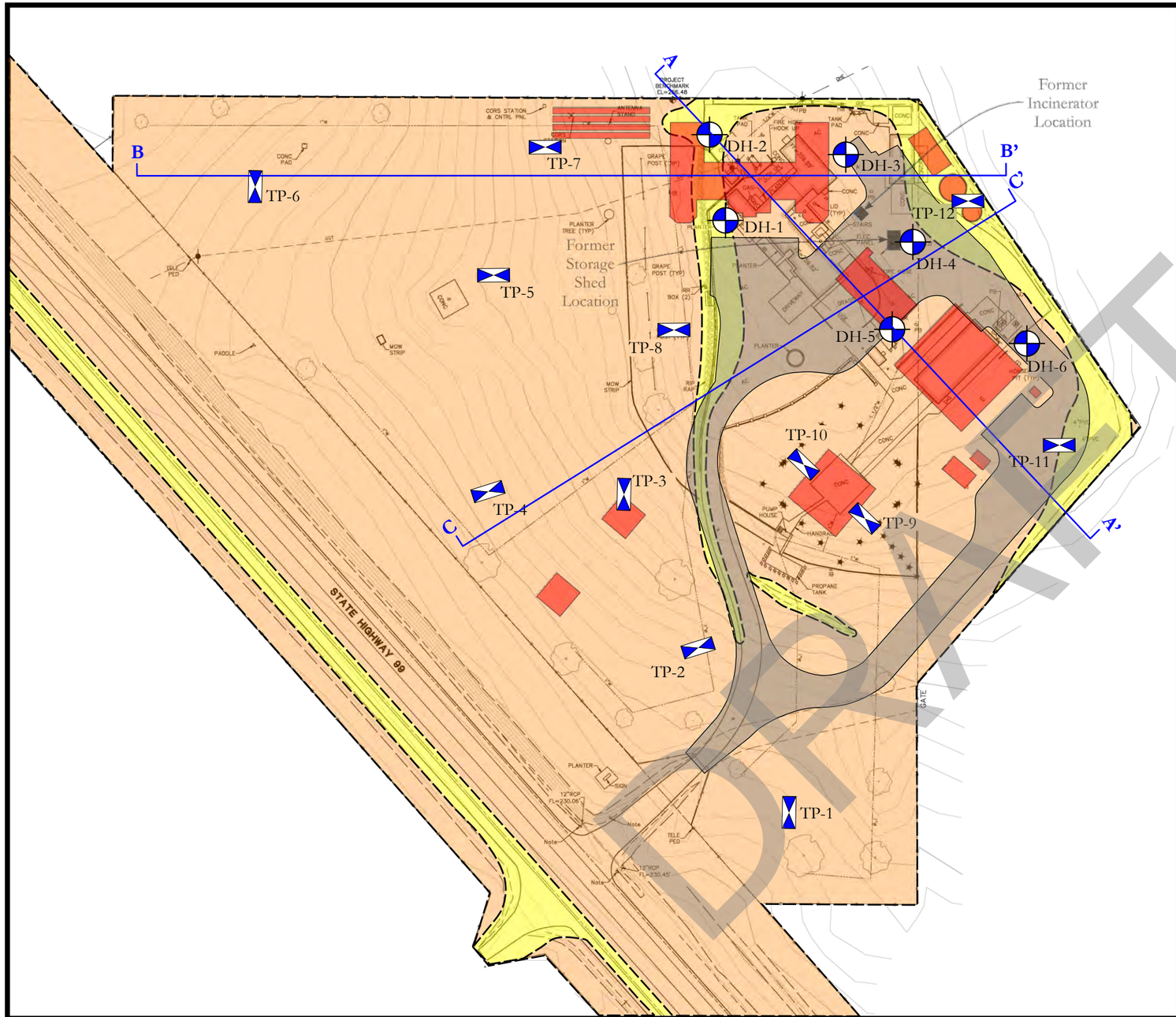
PROJECT ELEMENTS
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate

2



Approximate Drill Hole Location (DH-6)

Approximate Test Pit Location (TP-12)

Artifical Fill

Red Bluff Formation

Proposed Improvement Location

C — C' Geotechnical Cross Sections (see Plate 4)

Geologic Contact: dashed where approximate, dotted where covered, queried where uncertain

0 50 100

Scale: 1"=100'
1:1,200

Improvement locations based on Proposed Site Plan 'Scheme A' prepared by Nichols Melburg & Rossetto dated 1-27-14
Topographic base map obtained from Omni-Means, Ltd on February 10, 2014..

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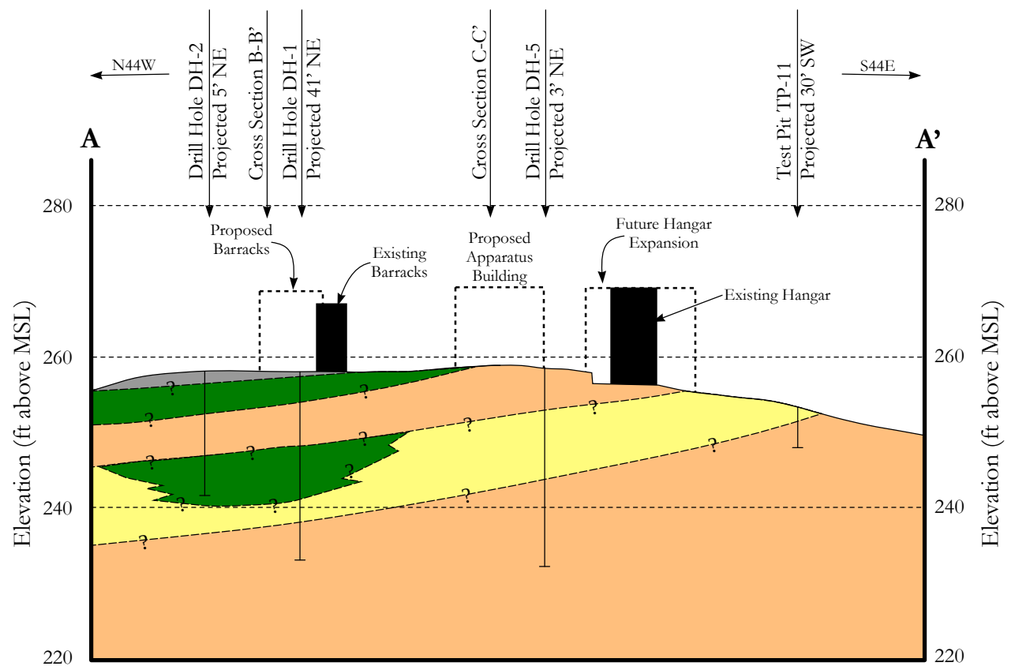
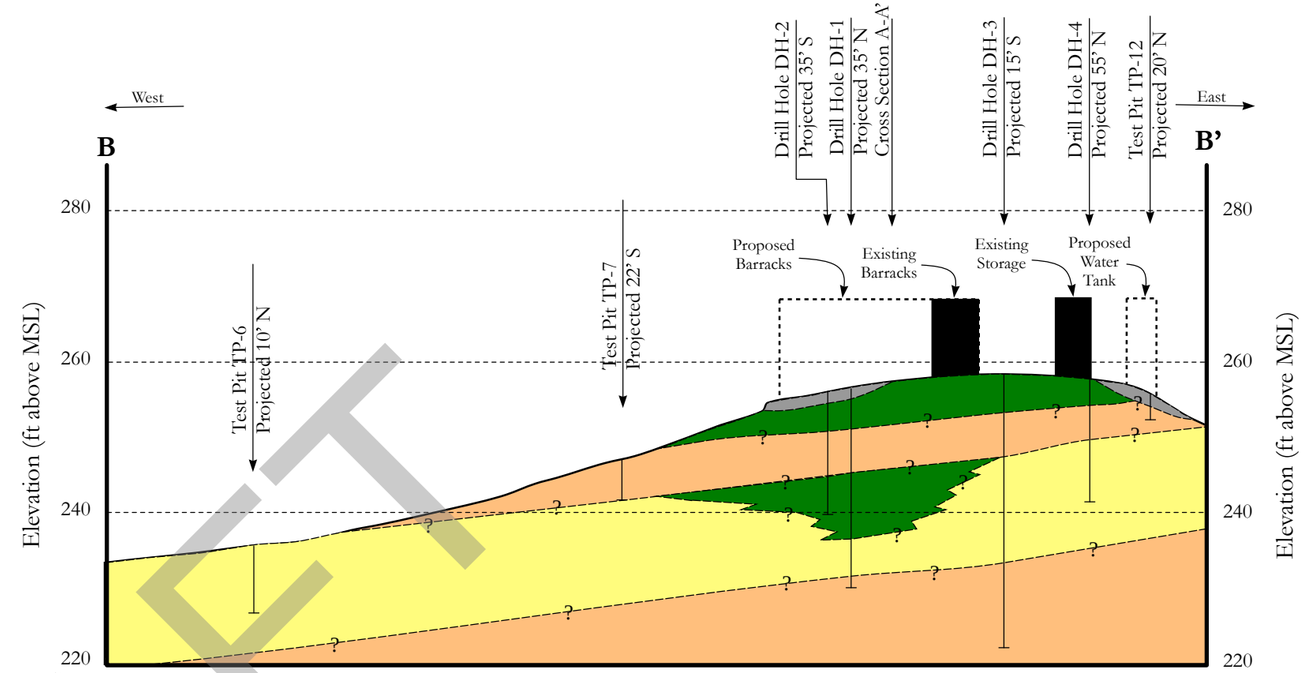
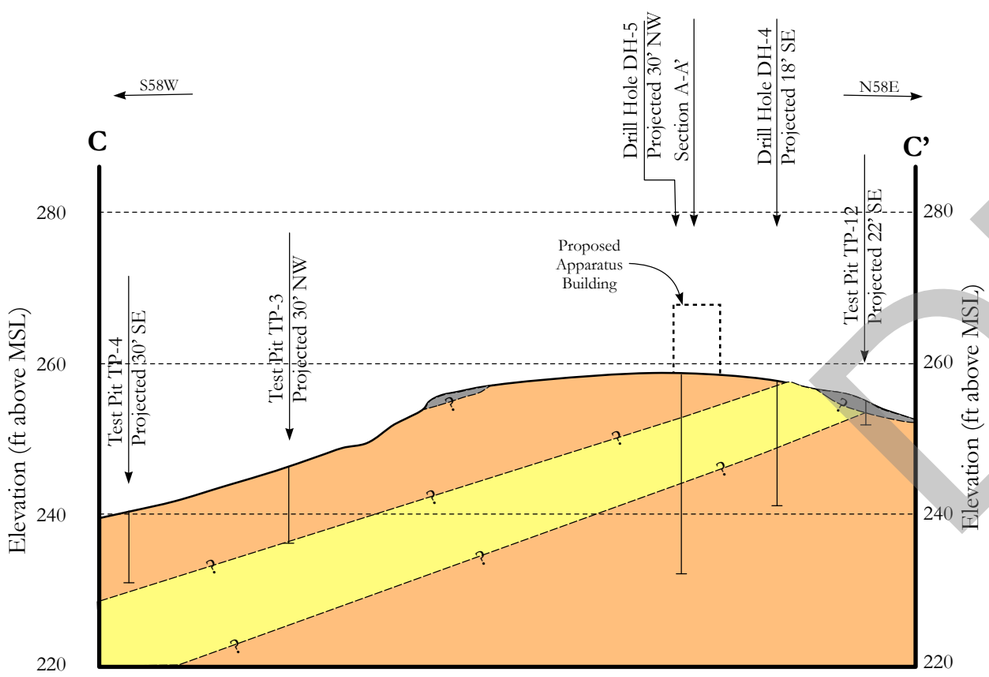
Project No.: 13-1629.26

GEOTECHNICAL MAP
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate 3







See Plate 3 for cross section locations

Artificial Fill

Predomiantely clay-rich

Predominately sandy soils

Predominately silty soils

Geologic Contact
Dashed Where Infered
Queried where Uncertain

Exploration Location

20'
100'
0
Scale:
Vertical: 1"=20'
Horizontal: 1"=100'
Vertical Exaggeration: 5x

See Plate 3 for cross section locations

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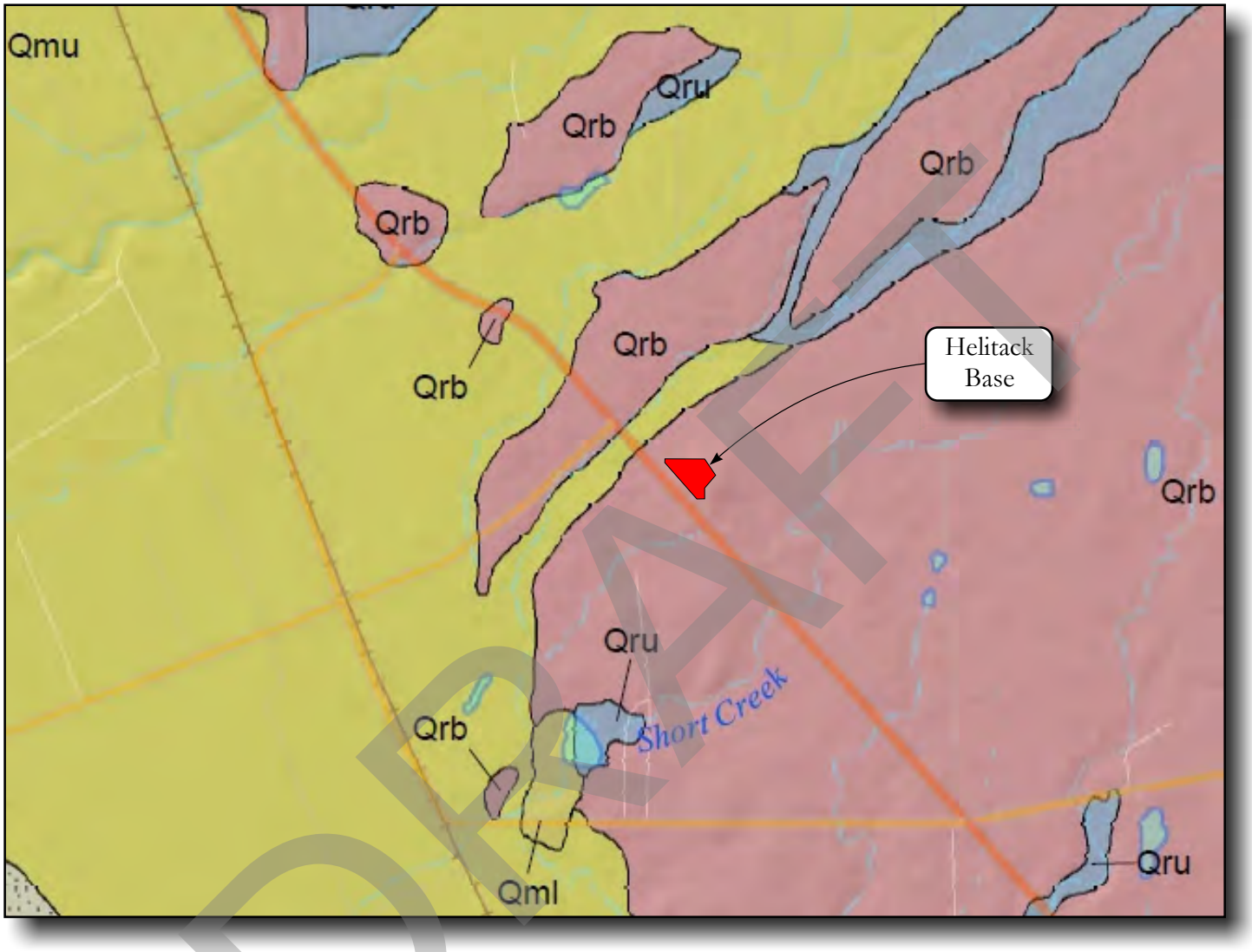
GEOTECHNICAL CROSS SECTIONS
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate
4



Scale not Determined

Qru Riverbank Formation - Upper Unit

Qmu Modesto Formation - Upper Unit

Qml Modesto Formation - Lower Unit

Qrb Red Bluff Formation

Geologic map derived from Helley & Harwood (1985)

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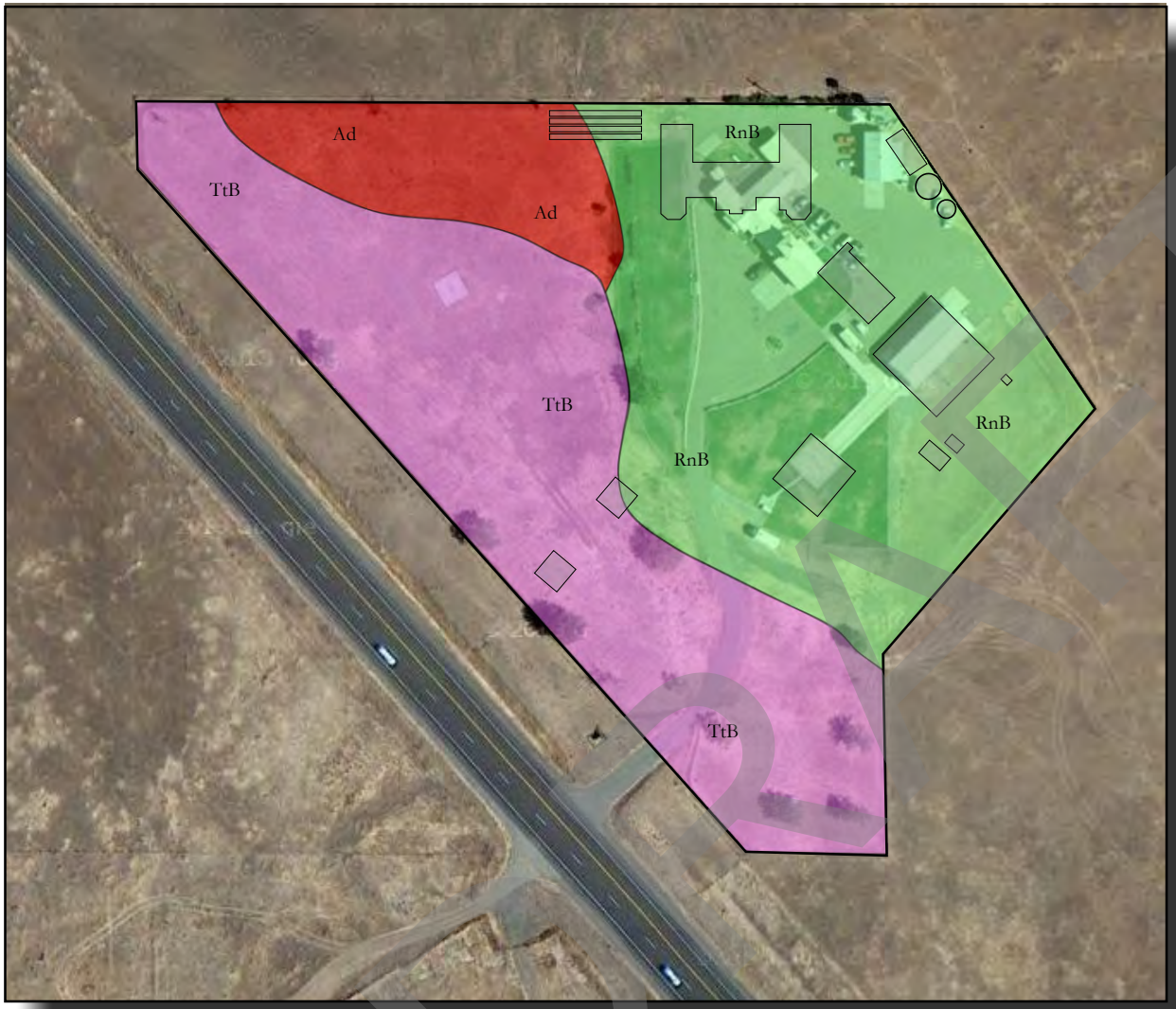
REGIONAL GEOLOGIC MAP
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate

5



Scale not Determined

Ad	Anita clay
TtB	Tuscan clay loam, 1% to 8% Slopes
RnB	Redding gravelly loan, 3% to 8% Slopes

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Soils map derived from NCRS (2014)

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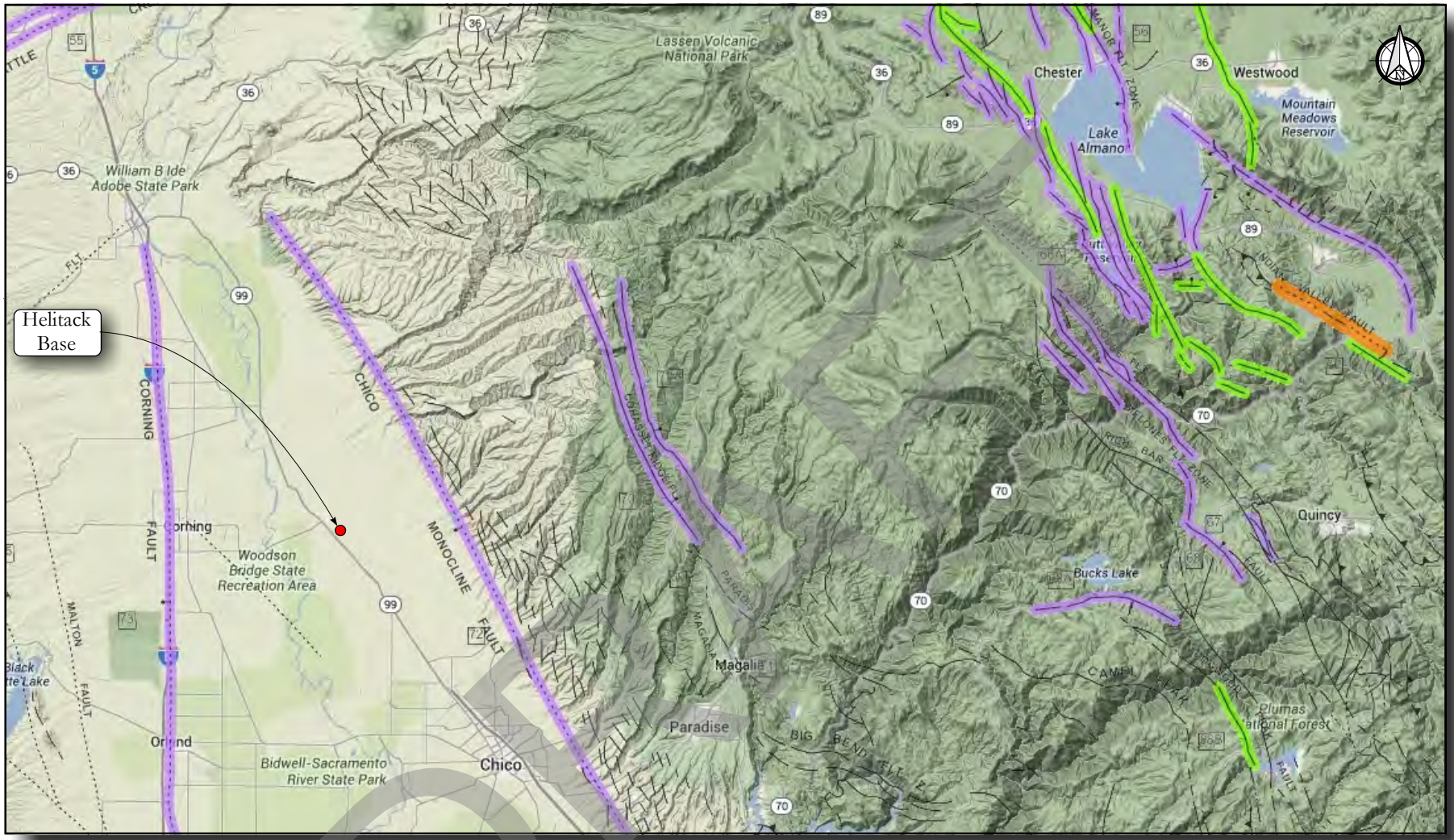
SOIL SERVICE MAP
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate

6



Historic Displacement (last 200 years)

Holocene Displacement (last 11,700 years)

Late Quaternary Displacement (last 700,000 years)

Quaternary Fault (last 1.6 million years)

Map from California Geological Survey 2010 Fault Activity Map of California

Scale not Determined

CGI Technical Services Inc.

Project No.: 13-1629.26

REGIONAL FAULT MAP
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate

7

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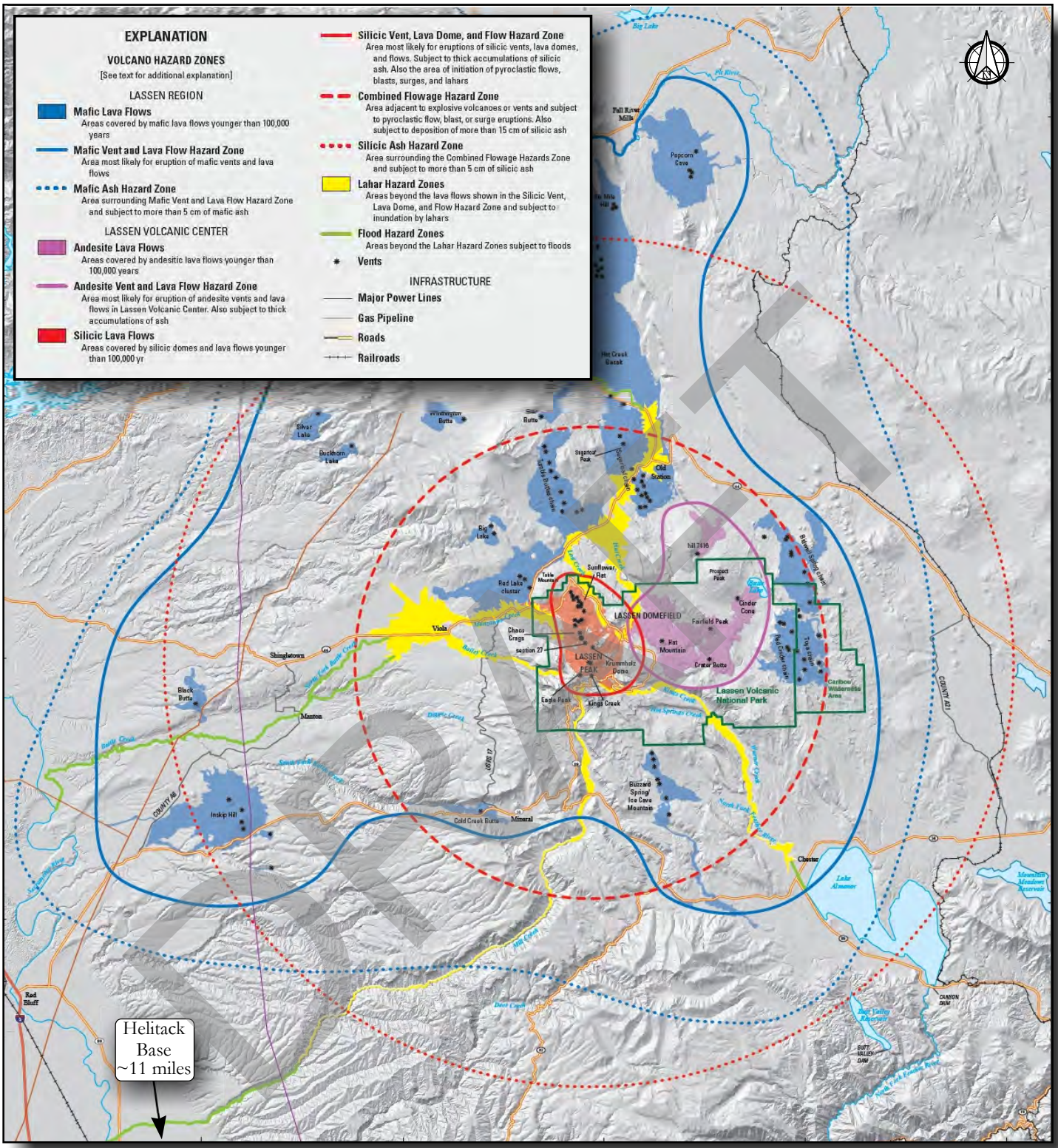

Map derived from Robinson & Clynne (2012) and Clynne et al. (2012)

Scale not Determined

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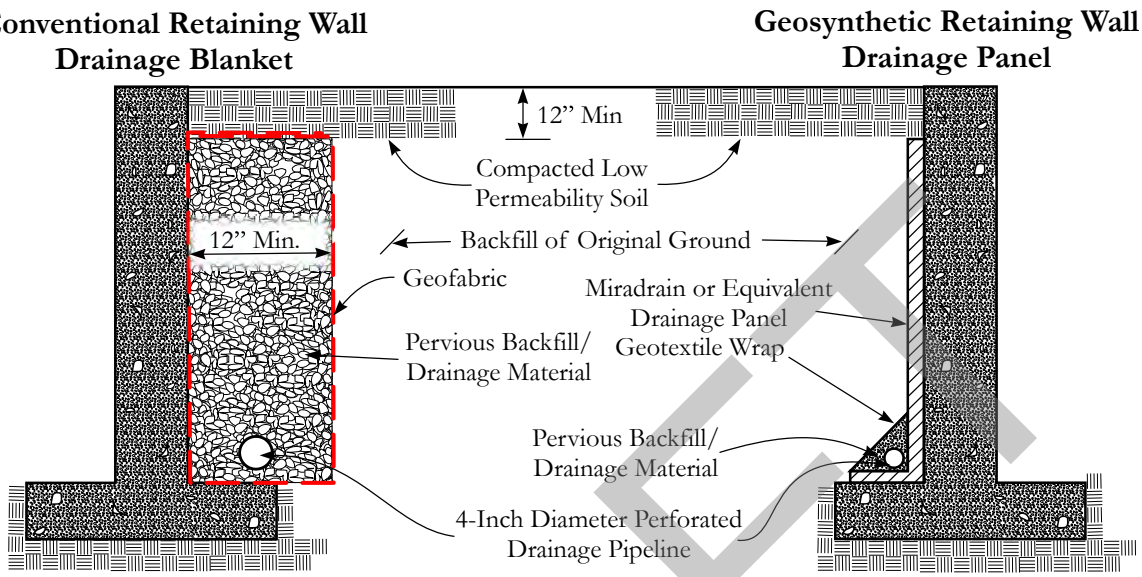
Project No.: 13-1629.26

LAHAR, LAVA & ASH HAZARDS
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate

8



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General Notes

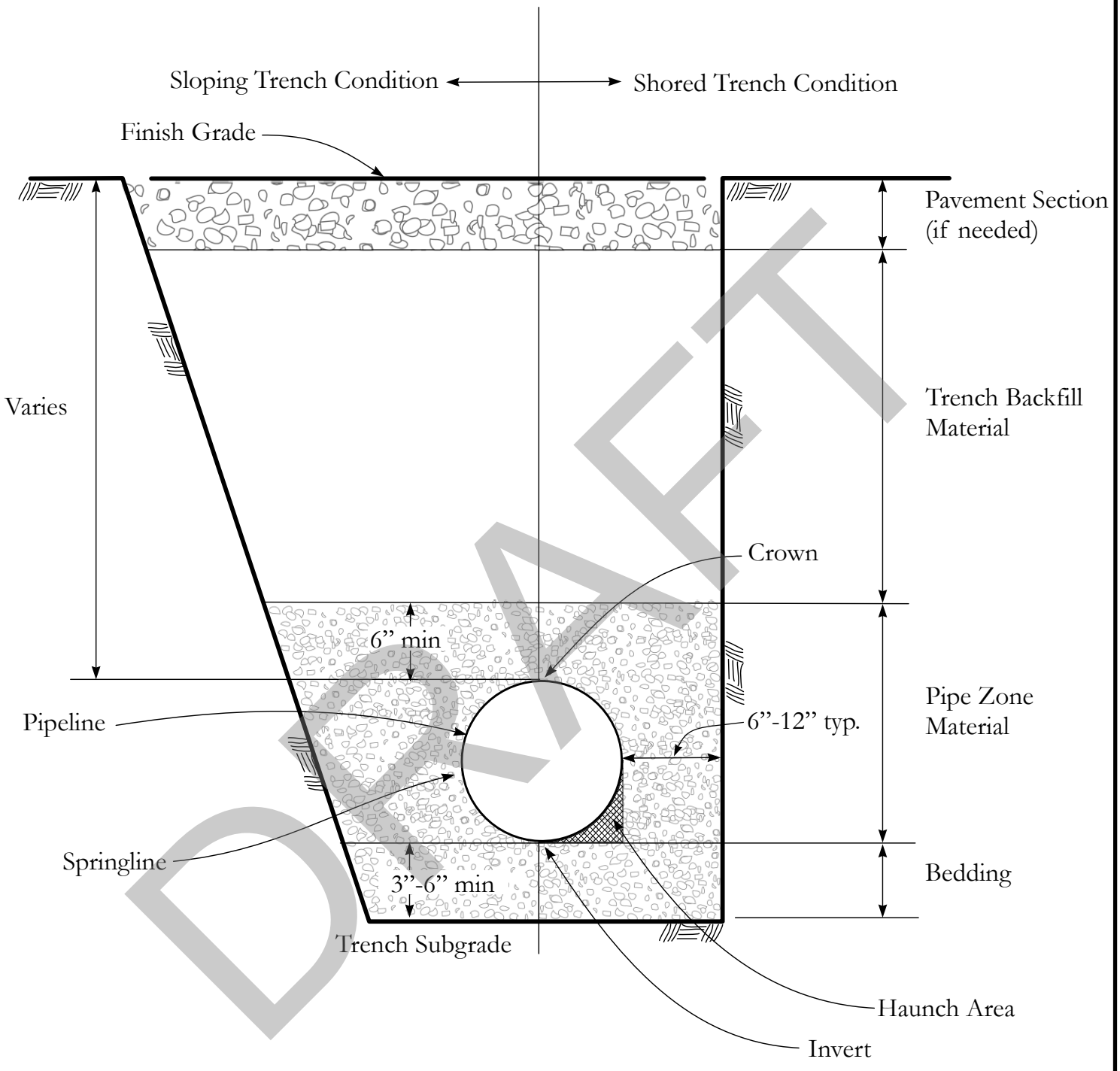
Pervious backfill/drainage material should conform to Pervious Backfill per Greenbook specifications, Class 2 Permeable Material per Caltrans Standard Specifications, pea gravel having a nominal 1/4-inch diameter, or crushed stone sized between 1/4-inch and 1/2-inch.

Geosynthetic wrapping material should conform to Caltrans Standard Specifications Section 88, placed per manufacturer's specifications.

Performated drain pipe should ocnsist of 4-inch diameter Schedule 40 PVC, with two sets of 1/4-inch (maximum) diameter performations drilled axially at 90 degrees to each other, with at least one perforation per line spaced at 12 inches, and the perforations facing downward.

Drainage should be collected in a solid conduit and diverted to a proper, approved drainage facility.

CGI Technical Services Inc.	RETAINING WALL DETAILS CALFIRE VINA HELITACK BASE REPLACEMENT CALIFORNIA DEPARTMENT OF GENERAL SERVICES TEHAMA COUNTY, CALIFORNIA	Plate 9
Project No.: 13-1629.26		



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Not to Scale

CGI Technical Services Inc.	TRENCH NOMENCLATURE CALFIRE VINA HELITACK BASE REPLACEMENT CALIFORNIA DEPARTMENT OF GENERAL SERVICES TEHAMA COUNTY, CALIFORNIA	Plate **10**
Project No.: 13-1629.26		

APPENDIX A
SUBSURFACE EXPLORATION

The subsurface exploration program for this study consisted of the advancement of six drill holes and twelve backhoe test pits. The locations of the explorations advanced for this study are shown on Plate 3. The drill holes were advanced on January 9 and 10, 2014 using a Mobil Drill B-59 drill rig provided by Diamond Core Drilling of the City of Shasta Lake, California. The drill holes were advanced using 8.25-inch diameter hollowstem augers.

Select samples of soils were collected from selected depth increments in each drill hole using California modified split-spoon and/or Standard Penetration Test (SPT) samplers. Samplers were driven by a 140-pound hammer situated on the drill rig, in accordance with standard test method ASTM D1586-11 Bulk samples were also obtained at selected depth intervals. Sample types and depths are presented on Plates A-2.1 through A-2.6. All samples were returned to CGI's Redding, California laboratory for testing. The results of the testing procedures are attached within Appendix B.

Test pits were excavated using a Caterpillar 430D rubber-tired backhoe equipped with a two-foot wide bucket. Test pits were excavated on February 7, 2014 and ranged in depth from about 3 to 11 feet. Bulk samples were obtained at selected depth intervals from selected test pits. Sample depths are presented on Plates A-4.1 through A-4.12. All samples were returned to CGI's Redding, California laboratory for testing. The results of the testing procedures are attached within Appendix B.

The exploration logs describe the earth materials encountered. The logs also show the location, exploration number, date of exploration, and the names of the logger and equipment used. A CGI geologist, using ASTM 2488 for visual soil classification, logged the explorations. The boundaries between soil types shown on the logs are approximate because the transition between different soil layers may be gradual and may change with time. The drill holes were backfilled with bentonite chips. Soils generated by drilling operations were disposed of on-site. Backhoe test pits were backfilled with the excavated soils and wheel rolled.

The drill hole logs are presented as Plates A-2.1 through A-2.6. A legend to the drill hole logs is presented as Plate A-1.0. The test pit logs are presented as Plates A-4.1 through A-4.12. A legend to test pits logs is presented as Plate A-3.0.

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LOG OF EXPLORATION: Expl. No.

PROJECT:	CGI's Project Name	**EXPL. VENDOR:**	Expl. Subcontractor	**SURFACE ELEVATION:**	Expl. Elevation
PROJECT NO.:	CGI's Project No.	**EXPL. METHOD:**	Method of Expl.	**TOTAL DEPTH OF HOLE:**	Total Depth of Expl.
LOCATION:	General Location	**LOGGED BY:**	CGI's Logger	**DEPTH TO WATER:**	Depth to Water
START DATE:	Date Started	**CHECKED BY:**	CGI's Reviewer	**BACKFILLED WITH:**	Backfill Materials
END DATE:	Date Finished	**HAMMER TYPE:**	Type of Sample Hammer		

Depth (ft)	Material Symbol	Sample	Sample No.	Blow Count (blows/ft)	USCS Symbol	Material Description	Water Table	Unit Dry Weight, pcf	Water Content, %	% Passing No. 200	Liquid Limit	Plasticity Index	Notes & Assigned Laboratory
0		⊠	1			SAMPLES/BLOW COUNT SYMBOLS KEY Bulk Soils Sample							
		▦	2	(24)		California modified split spoon sampler (CMSS) Brackets on blow counts indicates CMSS sample							CMSS: 2-3/8" ID, 3" OD, Driven
5		◪	3	50:5"		Standard penetration test (SPT) sample and blow count							SPT: 1-3/8" ID, 2" OD, Driven
		⊕				No sample recovery							Blow counts are recorded as the number of blows required for one foot of sampler penetration using a 140-lb hammer falling 30 inches. Typically, sampler is driven 18" and the initial 6" discarded.
						LITHOLOGIC GRAPHICS DESCRIPTIONS FOR SOILS MATERIALS (per ASTM D2487 & D2488)							
10					GW	well graded GRAVEL							
					GP	poorly graded GRAVEL							
					GM	silty GRAVEL							
					GC	clayey GRAVEL							
15					SW	well graded SAND							
					SP	poorly graded SAND	⊠						Initial water level measurement
					SM	silty SAND	▼						Water level after initial measurement (may not represent stabilized water levels)
					SC	clayey SAND							
20					ML	low plasticity SILT							
					MH	high plasticity SILT							
					CL	lean CLAY							Lab Abbreviations DS-direct shear; C-consolidation; GS-sieve; EI-Expansion Index; PI-Plasticity; UC-Unconfined; SC-soil chem.; SE-sand equiv.; R-R value; P-curve; PP-pocket penetrometer.
					CH	fat CLAY							
25					PT	organic soils or peat							
					OL	organic SILTS or CLAYS with low plasticity							
					OH	organic SILTS or CLAYS with high plasticity							
30					RX	ROCK							

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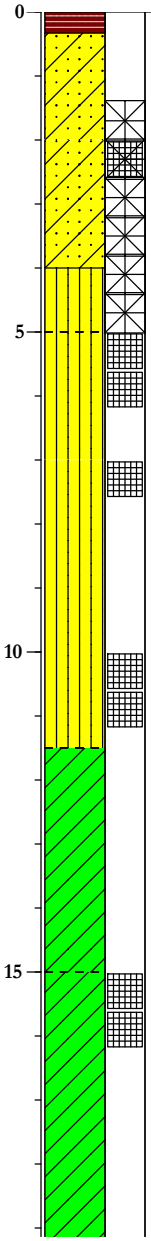
The log and data presented are a simplification of actual conditions encountered at the given location and time of exploration. Subsurface conditions may differ at other locations and with the passage of time.

PLATE NO.: A-1.1

LOG OF EXPLORATION: DH-1

PROJECT:	Vina Helitack Base	**EXPL. VENDOR:**	Diamond Core Drilling	**SURFACE ELEVATION:**	257 MSL
PROJECT NO.:	13-1629.26	**EXPL. METHOD:**	8.25" HSA	**TOTAL DEPTH OF HOLE:**	26.5 Feet
LOCATION:	Tehama County, CA	**LOGGED BY:**	J.A. Bianchin	**DEPTH TO WATER:**	Not Encountered
START DATE:	January 9, 2014	**CHECKED BY:**	A. Bahloul	**BACKFILLED WITH:**	Bentonite Chips
END DATE:	January 9, 2014	**HAMMER TYPE:**	140-Lb		



Depth (ft)	Sample No.	Blow Count (blows/ft)	USCS Symbol	Material Description	Water Table	Unit Dry Weight, pcf	Water Content, %	% Passing No. 200	Liquid Limit	Plasticity Index	Notes & Assigned Laboratory
0			af	ASPHALTIC CONCRETE (4 inches)							
	B1		CL/SC	ARTIFICIAL FILL (af) Clayey SAND to Sandy CLAY with Gravel, moderate brown, moist, sklightly plastic to plastic, fine to coarse grained with abundant subrounded fine to coarse gravel.							
	1	(50:5")		At 2 feet: very dense.		103.7	8.9	5.2		NP	PI, GS, R-Value
			ML	RED BLUFF FORMATION (Qrb) Clayey SILT, moderate brown, damp to wet, dense, slightly plastic, with trace fine sand.							
5	2	(50:5")	ML	Clayey SILT, greyish brown, dry, very dense, nonplastic, with fine sand and trace subrounded fine to medium gravel.		85.4	32.9				
	3	(50:5")		At 7 feet: with trace to few fine to medium pores.		76.5	40.6				
10	4	(38)				64.7	58.7				
			CL	Silty CLAY, greyish brown, moist to wet, stiff, plastic.							
15	5	(71)	CL	Sandy CLAY, greyish brown, moist, stiff to hard, fine to coarse grained, with lenses of subangular fine gravel.		72.4	37.2				

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The log and data presented are a simplification of actual conditions encountered at the given location and time of exploration. Subsurface conditions may differ at other locations and with the passage of time.

PLATE NO.: A-2.1

LOG OF EXPLORATION: DH-1

PROJECT:	Vina Helitack Base	**EXPL. VENDOR:**	Diamond Core Drilling	**SURFACE ELEVATION:**	257 MSL
PROJECT NO.:	13-1629.26	**EXPL. METHOD:**	8.25" HSA	**TOTAL DEPTH OF HOLE:**	26.5 Feet
LOCATION:	Tehama County, CA	**LOGGED BY:**	J.A. Bianchin	**DEPTH TO WATER:**	Not Encountered
START DATE:	January 9, 2014	**CHECKED BY:**	A. Bahloul	**BACKFILLED WITH:**	Bentonite Chips
END DATE:	January 9, 2014	**HAMMER TYPE:**	140-Lb		

Depth (ft)	**Material Symbol**	Sample	Sample No.	Blow Count (blows/ft)	USCS Symbol	Material Description	Water Table	Unit Dry Weight, pcf	Water Content, %	% Passing No. 200	Liquid Limit	Plasticity Index	Notes & Assigned Laboratory
20			6	(37)	ML	Sandy SILT, light grey, moist, dense, fine grained, slightly plastic.							
25			7	(69)	SM/ SC	Silty to Clayey SAND (SM/SC), medium brown, moist, very dense, fine to medium grained, with trace to moderate subangular fine gravel.							
						Bottom of Drill Hole at a Depth of 26.5 Feet.							

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CGI Technical Services Inc.

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PLATE NO.: A-2.1

LOG OF EXPLORATION: DH-2

PROJECT:	Vina Helitack Base	**EXPL. VENDOR:**	Diamond Core Drilling	**SURFACE ELEVATION:**	258 MSL
PROJECT NO.:	13-1629.26	**EXPL. METHOD:**	8.25" HSA	**TOTAL DEPTH OF HOLE:**	16.5 Feet
LOCATION:	Tehama County, CA	**LOGGED BY:**	J.A. Bianchin	**DEPTH TO WATER:**	Not Encountered
START DATE:	January 9, 2014	**CHECKED BY:**	A. Bahloul	**BACKFILLED WITH:**	Bentonite Chips
END DATE:	January 9, 2014	**HAMMER TYPE:**	140-Lb		

Depth (ft)	Material Symbol	Sample	Sample No.	Blow Count (blows/ft)	USCS Symbol	Material Description	Water Table	Unit Dry Weight, pcf	Water Content, %	% Passing No. 200	Liquid Limit	Plasticity Index	Notes & Assigned Laboratory
0					af	ASPHALTIC CONCRETE (1.5 inches)							
					SM	Aggregate Base (2.5 inches)							
			1	(50:3')	ML	ARTIFICIAL FILL (af) Silty SAND, light brown, dry, nonplastic, fine to medium grained, with trace to moderate subangular fine to medium gravel. At 3 feet: very dense.				20.2		NP	GS, PI
						RED BLUFF FORMATION (Qrb) Fine Sandy SILT, light grey, moist, very dense, nonplastic.							
5			2	(50:2")									
					SM	Silty SAND, light grey, moist, very dense, nonplastic, fine to medium grained, with trace fine pores.							
			3	(87)									
10			4	(79)									
					ML/CL	Clayey SILT to Silty CLAY, light grey, moist, very dense/hard, slightly plastic, with trace fine sand.							
15			5	(50:5")									
						Bottom of Drill Hole at a Depth of 16.5 Feet.							

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CGI Technical Services Inc.

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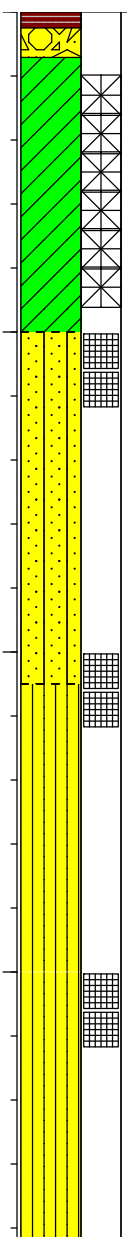
PLATE NO.: A-2.2

LOG OF EXPLORATION: DH-3

PROJECT:	Vina Helitack Base	**EXPL. VENDOR:**	Diamond Core Drilling	**SURFACE ELEVATION:**	259 MSL
PROJECT NO.:	13-1629.26	**EXPL. METHOD:**	8.25" HSA	**TOTAL DEPTH OF HOLE:**	36.5 Feet
LOCATION:	Tehama County, CA	**LOGGED BY:**	J.A. Bianchin	**DEPTH TO WATER:**	Not Encountered
START DATE:	January 9, 2014	**CHECKED BY:**	A. Bahloul	**BACKFILLED WITH:**	Bentonite Chips
END DATE:	January 9, 2014	**HAMMER TYPE:**	140-Lb		



Depth (ft)	Material Symbol	Sample	Sample No.	Blow Count (blows/ft)	USCS Symbol	Material Description	Water Table	Unit Dry Weight, pcf	Water Content, %	% Passing No. 200	Liquid Limit	Plasticity Index	Notes & Assigned Laboratory
0					af	ASPHALTIC CONCRETE (3 inches)							
			B1		CL	AGGREGATE BASE (5.5 inches)					29.0	9.9	PI
						RED BLUFF FORMATION (Qrb) Sandy CLAY, moderate brown, moist, slightly plastic, with fine to medium sand and trace coarse sand.							
5			1	(70)	SM	Silty SAND, moderate yellowish brown, moist, very dense, fine to medioum grained with trace coarse sand, slightly plastic with trace clay.		107.4	19.3				
10			2	(67)	ML	Sandy SILT, light grey to light yellowish brown, moist, very dense, very fine grained, with trace clay, trace fine roots, and trace carbon (organics).		78.7	40.9				
15			3	(73)		At 15 feet: trace to moderate fine to medium pores.		82.4	38.9				

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CGI Technical Services Inc.

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PLATE NO.: A-2.3

LOG OF EXPLORATION: DH-3

PROJECT:	Vina Helitack Base	**EXPL. VENDOR:**	Diamond Core Drilling	**SURFACE ELEVATION:**	259 MSL
PROJECT NO.:	13-1629.26	**EXPL. METHOD:**	8.25" HSA	**TOTAL DEPTH OF HOLE:**	36.5 Feet
LOCATION:	Tehama County, CA	**LOGGED BY:**	J.A. Bianchin	**DEPTH TO WATER:**	Not Encountered
START DATE:	January 9, 2014	**CHECKED BY:**	A. Bahloul	**BACKFILLED WITH:**	Bentonite Chips
END DATE:	January 9, 2014	**HAMMER TYPE:**	140-Lb		

Depth (ft)	Material Symbol	Sample	Sample No.	Blow Count (blows/ft)	USCS Symbol	Material Description	Water Table	Unit Dry Weight, pcf	Water Content, %	% Passing No. 200	Liquid Limit	Plasticity Index	Notes & Assigned Laboratory
20			4	46									
						At 22 feet: wet.							
25			5	70									
					SM/ ML	Silty SAND to Sandy SILT, moderate brown, moist, very dense, fine grained, with trace medium sand, slightly plastic.							
30			6	45	SM	Silty SAND, moderate brown, dry, dense to very dense, fine to medium grained, nonplastic, interbedded with Clayey SILT, light grey, moist, medium dense, slightly plastic.							
35			7	43	SM	Silty SAND, moderate brown, dry, dense, nonplastic, fine grained with trace medium grains, and moderate caliche.							
						Bottom of Drill Hole at a Depth of 36.5 Feet.							

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CGI Technical Services Inc.

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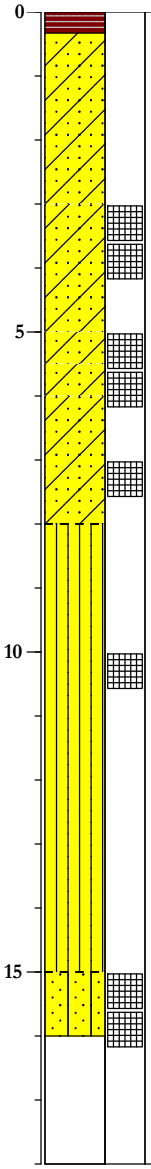
PLATE NO.: A-2.3

LOG OF EXPLORATION: DH-4

PROJECT:	Vina Helitack Base	**EXPL. VENDOR:**	Diamond Core Drilling	**SURFACE ELEVATION:**	258 MSL
PROJECT NO.:	13-1629.26	**EXPL. METHOD:**	8.25" HSA	**TOTAL DEPTH OF HOLE:**	36.5 Feet
LOCATION:	Tehama County, CA	**LOGGED BY:**	J.A. Bianchin	**DEPTH TO WATER:**	Not Encountered
START DATE:	January 9, 2014	**CHECKED BY:**	A. Bahloul	**BACKFILLED WITH:**	Bentonite Chips
END DATE:	January 9, 2014	**HAMMER TYPE:**	140-Lb		



Depth (ft)	Sample No.	Blow Count (blows/ft)	USCS Symbol	Material Description	Water Table	Unit Dry Weight, pcf	Water Content, %	% Passing No. 200	Liquid Limit	Plasticity Index	Notes & Assigned Laboratory
0			af	ASPHALTIC CONCRETE (4 inches)							
			SC	RED BLUFF FORMATION (Qrb) Clayey SAND, moderate brown, moist, slightly plastic, with fine to medium sand.							
	1	(72)		At 3 feet: very dense with fine to coarse sand and moderate subrounded to subangular fine to medium gravel.							
5	2	(94)		At 5 feet: with fine sand.							
				At 5.5 feet: with fine to coarse sand.							
	3	(50:4")		At 6 feet: with fine to medium sand, subangular fine gravel, trace subangular medium to coarse gravel, and slightly plastic.							
			ML	Sandy SILT, greyish brown, moist, very dense, nonplastic, very fine grained.							
10	4	(50:5")									
15	5	(66)	SM	Silty SAND, moderate brown, moist, very dense, fine to medium grained, with trace coarse sand, and trace clay.							
				Bottom of Drill Hole at a Depth of 16 Feet.							

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CGI Technical Services Inc.

The log and data presented are a simplification of actual conditions encountered at the given location and time of exploration. Subsurface conditions may differ at other locations and with the passage of time.

PLATE NO.: A-2.4

LOG OF EXPLORATION: DH-5

PROJECT:	Vina Helitack Base	**EXPL. VENDOR:**	Diamond Core Drilling	**SURFACE ELEVATION:**	258 MSL
PROJECT NO.:	13-1629.26	**EXPL. METHOD:**	8.25" HSA	**TOTAL DEPTH OF HOLE:**	26.5 Feet
LOCATION:	Tehama County, CA	**LOGGED BY:**	J.A. Bianchin	**DEPTH TO WATER:**	Not Encountered
START DATE:	January 10, 2014	**CHECKED BY:**	A. Bahloul	**BACKFILLED WITH:**	Bentonite Chips
END DATE:	January 10, 2014	**HAMMER TYPE:**	140-Lb		

Depth (ft)	Material Symbol	Sample	Sample No.	Blow Count (blows/ft)	USCS Symbol	Material Description	Water Table	Unit Dry Weight, pcf	Water Content, %	% Passing No. 200	Liquid Limit	Plasticity Index	Notes & Assigned Laboratory
0					af	ASPHALTIC CONCRETE (5 inches)							
			B1		SM/ SC	AGGREGATE BASE (3 inches)							Soil Chem
						RED BLUFF FORMATION (Qrb) Silty SAND to Clayey SAND, moderate brown, moist, fine to medium grained, slightly plastic.							
			1	(44)		At 3 feet: very dense, fine to coarse grained.		91.4	26.8			NP	PI
5			2	(50:5")	ML	Clayey SILT, greyish brown, moist, very dense, slightly plastic, with trace fine pores and trace organics (carbon).		77.6	41.4				
			3	(50:5")				75.7	42.1				
10			4	(50:4")				73.9	45.7				
15			5	51	SM	Silty fine SAND, Light greyish brown, damp, very dense, nonplastic, fine grained.							

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CGI Technical Services Inc.

The log and data presented are a simplification of actual conditions encountered at the given location and time of exploration. Subsurface conditions may differ at other locations and with the passage of time.

PLATE NO.: A-2.5

LOG OF EXPLORATION: DH-5

PROJECT:	Vina Helitack Base	**EXPL. VENDOR:**	Diamond Core Drilling	**SURFACE ELEVATION:**	258 MSL
PROJECT NO.:	13-1629.26	**EXPL. METHOD:**	8.25" HSA	**TOTAL DEPTH OF HOLE:**	26.5 Feet
LOCATION:	Tehama County, CA	**LOGGED BY:**	J.A. Bianchin	**DEPTH TO WATER:**	Not Encountered
START DATE:	January 10, 2014	**CHECKED BY:**	A. Bahloul	**BACKFILLED WITH:**	Bentonite Chips
END DATE:	January 10, 2014	**HAMMER TYPE:**	140-Lb		

Depth (ft)	**Material Symbol**	Sample	Sample No.	Blow Count (blows/ft)	USCS Symbol	Material Description	Water Table	Unit Dry Weight, pcf	Water Content, %	% Passing No. 200	Liquid Limit	Plasticity Index	Notes & Assigned Laboratory
20			6	24	ML	Sandy SILT, moderate brown, moist to wet, dense, very fine grained.							
25			7	44									
						Bottom of Drill Hole at a Depth of 26.5 Feet.							

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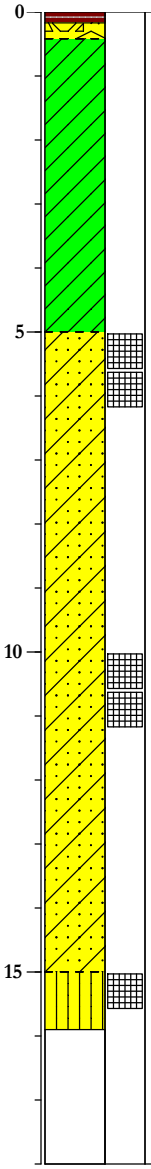
CGI Technical Services Inc.

The log and data presented are a simplification of actual conditions encountered at the given location and time of exploration. Subsurface conditions may differ at other locations and with the passage of time.

PLATE NO.: A-2.5

LOG OF EXPLORATION: DH-6

PROJECT:	Vina Helitack Base	**EXPL. VENDOR:**	Diamond Core Drilling	**SURFACE ELEVATION:**	256 MSL
PROJECT NO.:	13-1629.26	**EXPL. METHOD:**	8.25" HSA	**TOTAL DEPTH OF HOLE:**	15.9 Feet
LOCATION:	Tehama County, CA	**LOGGED BY:**	J.A. Bianchin	**DEPTH TO WATER:**	Not Encountered
START DATE:	January 10, 2014	**CHECKED BY:**	A. Bahloul	**BACKFILLED WITH:**	Bentonite Chips
END DATE:	January 10, 2014	**HAMMER TYPE:**	140-Lb		



Depth (ft)	Sample No.	Blow Count (blows/ft)	USCS Symbol	Material Description	Water Table	Unit Dry Weight, pcf	Water Content, %	% Passing No. 200	Liquid Limit	Plasticity Index	Notes & Assigned Laboratory
0			af	ASPHALTIC CONCRETE (2 inches)							
			CL	AGGREGATE BASE (3 inches)							
				RED BLUFF FORMATION (Qrb) Sandy CLAY, moderate brown, moist, plastic, fine grained.							
5	1	(69)	SC	Clayey SAND, moderate brown, moist, very dense, slightly plastic, fine to medium grained with trace coarse sand.		99.5	20.5	15.3			GS
10	2	(66)				93.2	15.0				
15	3	(50:4")	ML	Clayey SILT, light greyish brown, moist, very dense, slightly plastic, with trace to moderate fine pores and trace fine sand.		88.4	31.5				
				Bottom of Drill Hole at a Depth of 15.9 Feet.							

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The log and data presented are a simplification of actual conditions encountered at the given location and time of exploration. Subsurface conditions may differ at other locations and with the passage of time.

PLATE NO.: A-2.6

Major Divisions			USCS Symbol	Description
COARSE-GRAINED SOILS More than 50% of sample or material is larger than the No. 200 Sieve (0.0029 inches)	GRAVELS More than 50% of the coarse fraction is retained on No. 4 sieve (0.187 inches)	GRAVELS Clean Gravels, few fines	GW	Well graded gravels and sand mixtures with little to no fines
			GP	Poorly graded gravels & gravel/sand mixtures with little to no fines
		GRAVELS With appreciable fines	GM	Silty gravels and poorly graded gravel/sand/silt mixtures
			GC	Clayey gravels and poorly graded gravel/sand/clay mixtures
	SANDS More than 50% of the coarse fraction passes the No. 4 sieve (0.187 inches)	SANDS Clean Sands, few fines	SW	Well graded sands and gravelly sands with little to no fines
			SP	Poorly graded sands and gravelly sands with little to no fines
		SANDS With appreciable fines	SM	Silty sands and poorly graded sand/gravel/silt mixtures
			SC	Clayey sands and poorly graded sand/gravel/clay mixtures
FINE-GRAINED SOILS More than 50% of sample or material is smaller than the No. 200 Sieve (0.0029 inches)	SILTS & CLAYS Liquid limit less than 50		ML	Inorganic silts with very fine sands, silty and/or clayey fine sands, clayey silts with slight plasticity
			CL	Inorganic clays with low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and clays with low plasticity
	SILTS & CLAYS Liquid limit greater than 50		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts
			CH	Inorganic clays with high plasticity, fat clays
			OH	Orgainic silts and clays with high plasticity
HIGHLY ORGANIC SOIL			PT	Peat, humus, swamp soil with high organic content

Samples

- Bulk or disturbed sample
- Relatively undisturbed sample

Symbols

- Groundwater
- Caving
- Contact Between Soil/Rock Layers

GENERAL NOTES

Dual symbols (such as ML/CL or SM/SC) are used to indicate borderline classifications.
In general, USCS designations shown on the logs were evaluated using visual methods. Actual designations (based on laboratory tests) may vary.
Logs represent general soil conditions observed on the date and locations indicated. No warranty is provided regarding soil continuity between locations.
Lines separating soil strata on logs are approximate. Actual transitions may be gradual and vary with depth.

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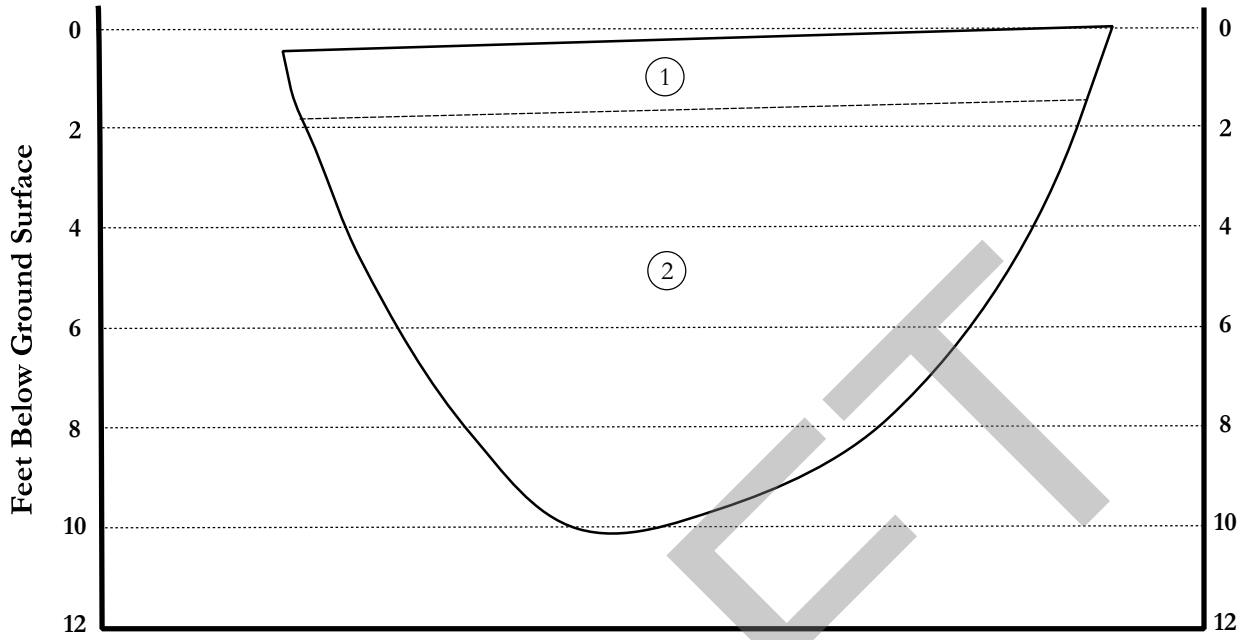
CGI TECHNICAL SERVICES INC.

Project No.: 13-1629.26

LEGEND TO TEST PIT LOGS
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate No.
A-3.0

LOG OF TEST PIT



Soil Descriptions	
1	Sandy SILT (ML), dark brown, dry, dense, fine grained with numerous fine pores and moderate fine roots.
2	Sandy SILT to Silty SAND (ML/SM), moderate brown, dry, medium dense to dense, fine grained, nonplastic, with trace clay.

Date Logged:	February 7, 2014	Excavated With:	Caterpillar 430D
Logged by:	Jim Bianchin	Backfilled With:	Excavated Cuttings
Excavator:	Elite Engineering	Depth to Water (ft):	Not Encountered

CGI Technical Services Inc.

Project No.: 13-1629.26

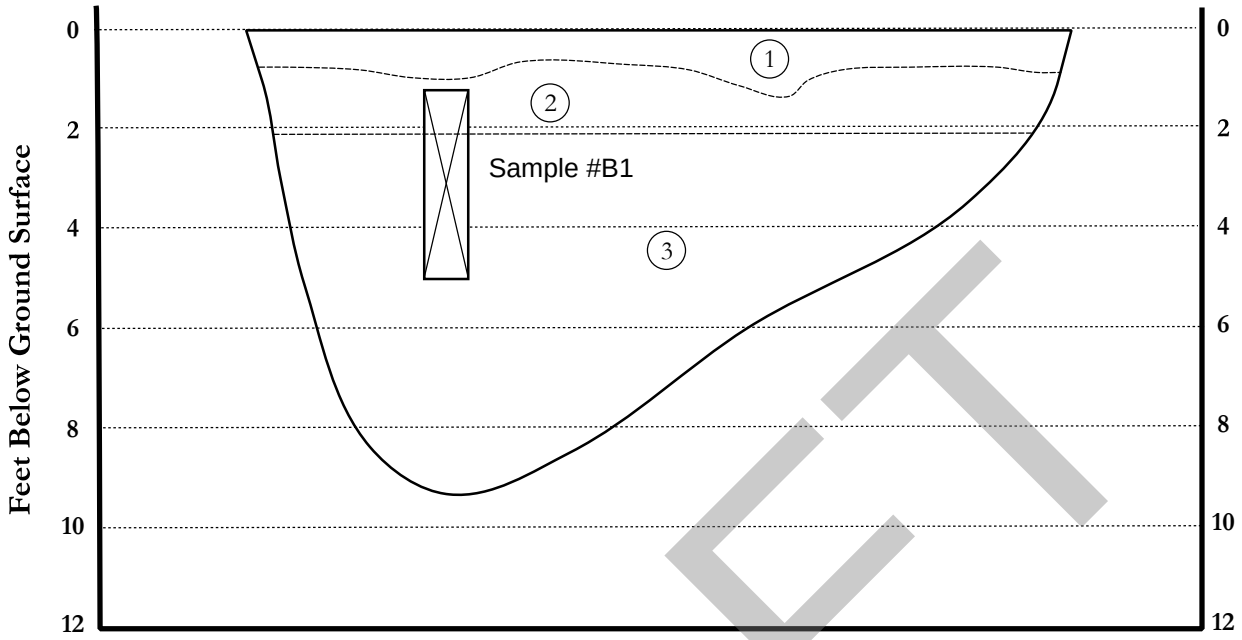
TEST PIT TP-1
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate No.

A-4.1

DRAFT

LOG OF TEST PIT



	Soil Descriptions
1	Sandy SILT (ML), dark brown, dry, dense, fine grained with numerous fine pores and moderate fine roots.
2	Silty SAND (SM), light brown, dry, medium dense, fine grained, nonplastic, with minor clay and trace fine pores.
3	Silty SAND (SM), light to medium brown, damp, dense to very dense, fine grained, nonplastic, with minor clay and trace fine pores.

Date Logged:	February 7, 2014	Excavated With:	Caterpillar 430D
Logged by:	Jim Bianchin	Backfilled With:	Excavated Cuttings
Excavator:	Elite Engineering	Depth to Water (ft):	Not Encountered

DRAFT

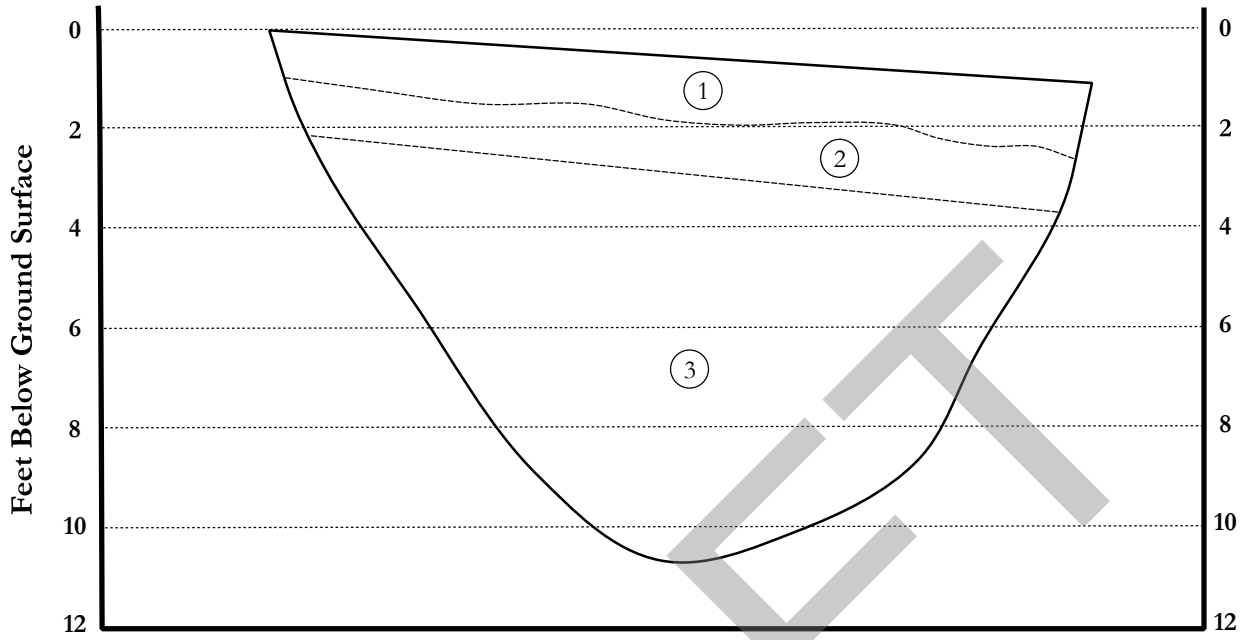
CGI Technical Services Inc.

Project No.: 13-1629.26

TEST PIT TP-2
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate No.
A-4.2

LOG OF TEST PIT



Soil Descriptions	
1	Sandy SILT (ML), dark brown, dry, dense, fine grained with numerous fine pores and moderate fine roots.
2	Silty SAND (SM), light brown, dry, medium dense, fine grained, nonplastic, with minor clay and trace fine pores.
3	Silty SAND (SM), light to medium brown, damp, dense to very dense, fine grained, nonplastic, with minor clay and trace fine pores.

Date Logged:	February 7, 2014	Excavated With:	Caterpillar 430D
Logged by:	Jim Bianchin	Backfilled With:	Excavated Cuttings
Excavator:	Elite Engineering	Depth to Water (ft):	Not Encountered

DRAFT

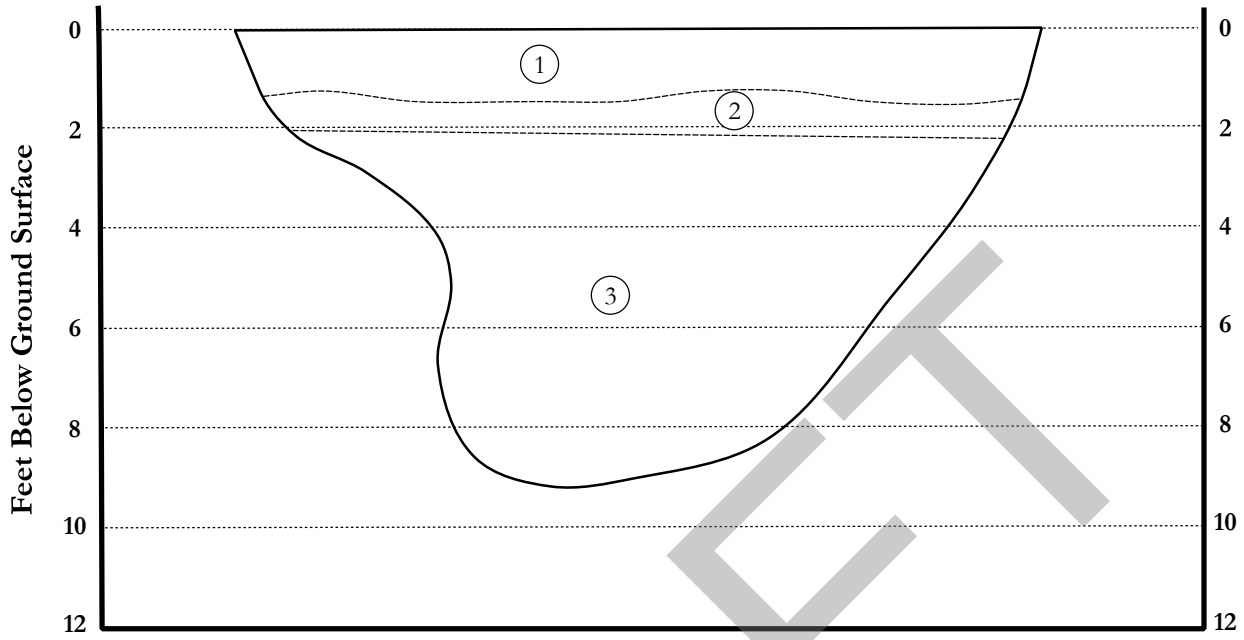
CGI Technical Services Inc.

Project No.: 13-1629.26

TEST PIT TP-3
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate No.
A-4.3

LOG OF TEST PIT



Soil Descriptions	
1	Sandy SILT (ML), dark brown, dry, dense, fine grained with numerous fine pores and moderate fine roots.
2	Silty SAND (SM), light brown, dry, medium dense, fine grained, nonplastic, with minor clay and trace fine pores.
3	Silty SAND (SM), light to medium brown, damp, dense to very dense, fine grained, nonplastic, with minor clay and trace fine pores.

Date Logged:	February 7, 2014	Excavated With:	Caterpillar 430D
Logged by:	Jim Bianchin	Backfilled With:	Excavated Cuttings
Excavator:	Elite Engineering	Depth to Water (ft):	Not Encountered

DRAFT

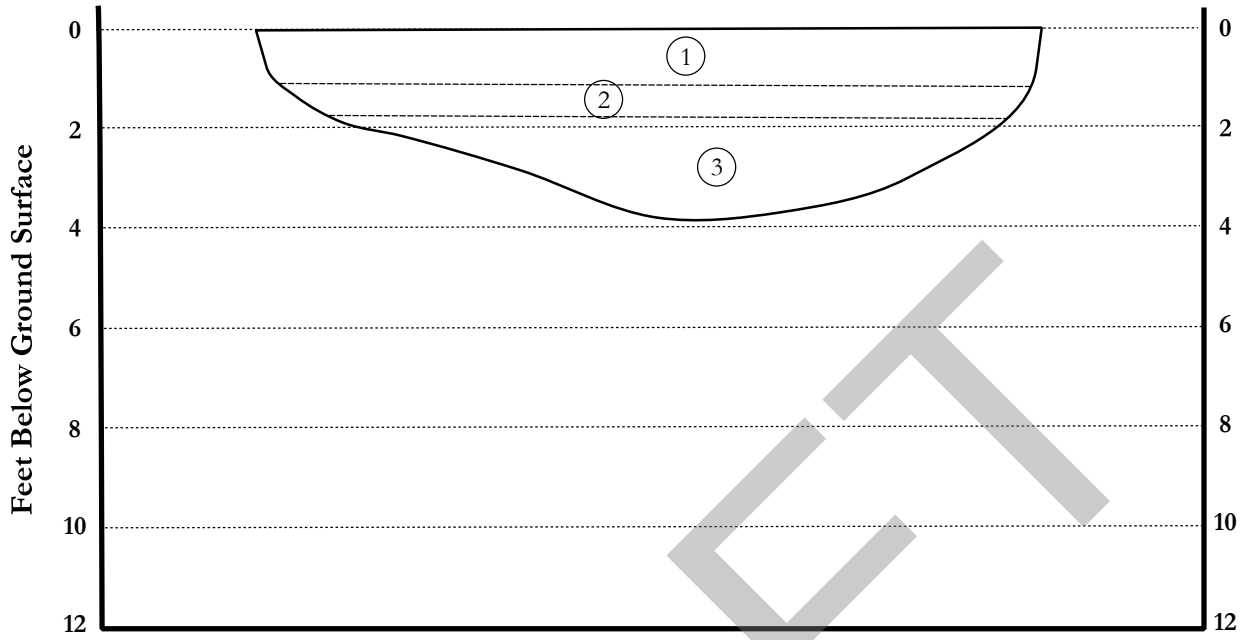
CGI Technical Services Inc.

Project No.: 13-1629.26

TEST PIT TP-4
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate No.
A-4.4

LOG OF TEST PIT



Soil Descriptions	
1	Sandy SILT (ML), dark brown, dry, dense, fine grained with numerous fine pores and moderate fine roots.
2	SANDSTONE (rx), dry, slightly hard, poorly indurated, highly weathered, massive, fine to medium grained.
3	SANDSTONE (rx), damp, slightly to moderately hard, poorly indurated, moderately weathered, fine grained, difficult to excavate with this backhoe.

Date Logged:	February 7, 2014	Excavated With:	Caterpillar 430D
Logged by:	Jim Bianchin	Backfilled With:	Excavated Cuttings
Excavator:	Elite Engineering	Depth to Water (ft):	Not Encountered

DRAFT

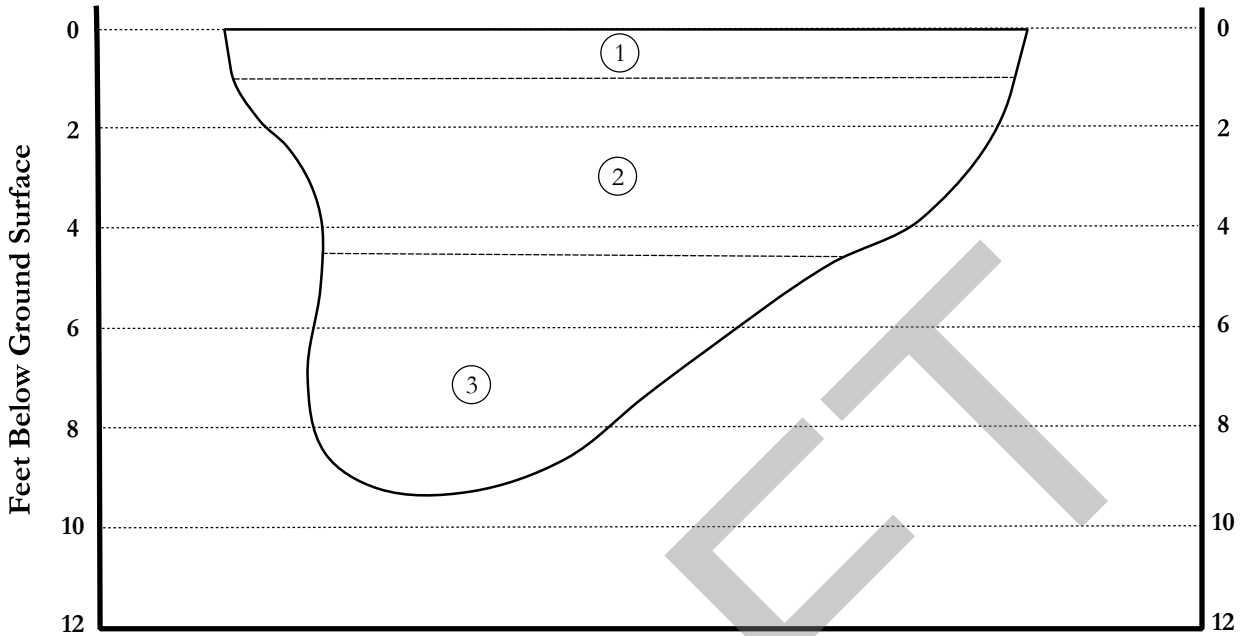
CGI Technical Services Inc.

Project No.: 13-1629.26

TEST PIT TP-5
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate No.
A-4.5

LOG OF TEST PIT



Soil Descriptions	
1	Sandy SILT (ML), dark brown, dry, dense, fine grained with numerous fine pores and moderate fine roots.
2	Silty SAND (SM), light brown, dry, medium dense, fine grained, nonplastic, with minor clay and trace fine pores.
3	SAND (SW), dark brown, damp, dense, fine to medium grained with trace coarse grains, interbedded with Silty SAND (SM), light to medium brown, damp, dense to very dense, fine grained, nonplastic, with minor clay and trace fine pores.

Date Logged:	February 7, 2014	Excavated With:	Caterpillar 430D
Logged by:	Jim Bianchin	Backfilled With:	Excavated Cuttings
Excavator:	Elite Engineering	Depth to Water (ft):	Not Encountered

DRAFT

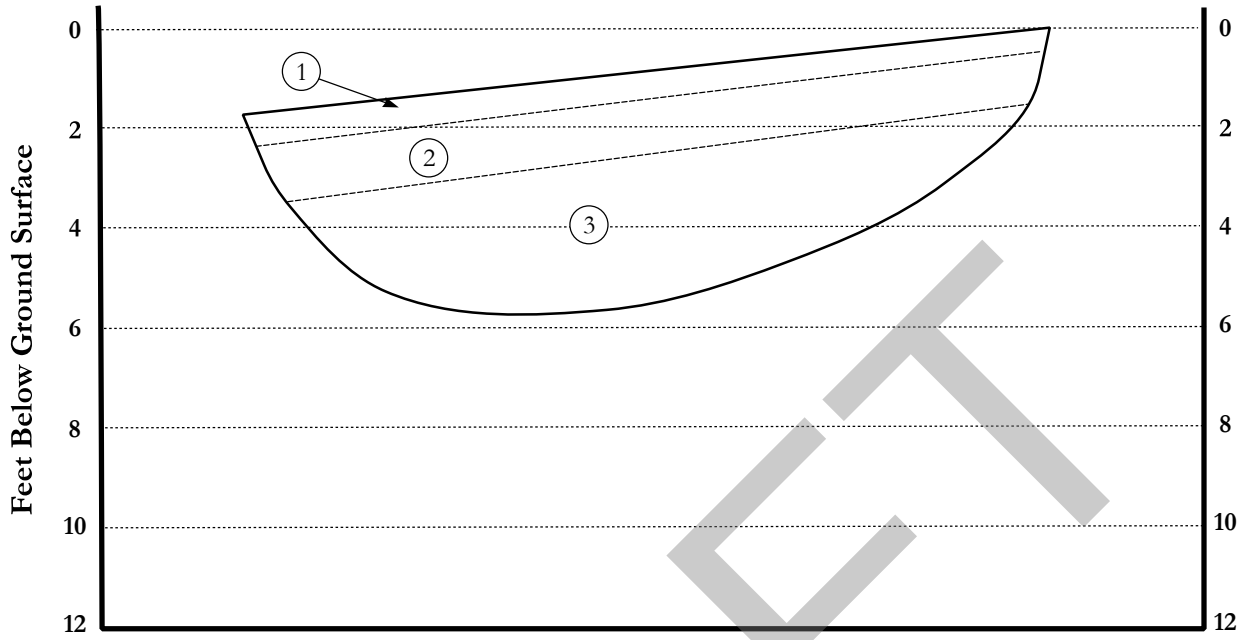
CGI Technical Services Inc.

Project No.: 13-1629.26

TEST PIT TP-6
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate No.
A-4.6

LOG OF TEST PIT



Soil Descriptions	
1	Sandy SILT (ML), dark brown, dry, dense, fine grained with numerous fine pores and moderate fine roots.
2	SANDSTONE (rx), medium brown, dry, highly weathered, fine grained. slightly hard, poorly indurated.
3	SANDSTONE (rx), medium brown, damp, moderately weathered, fine grained. slightly hard, poorly indurated.

Date Logged:	February 7, 2014	Excavated With:	Caterpillar 430D
Logged by:	Jim Bianchin	Backfilled With:	Excavated Cuttings
Excavator:	Elite Engineering	Depth to Water (ft):	Not Encountered

DRAFT

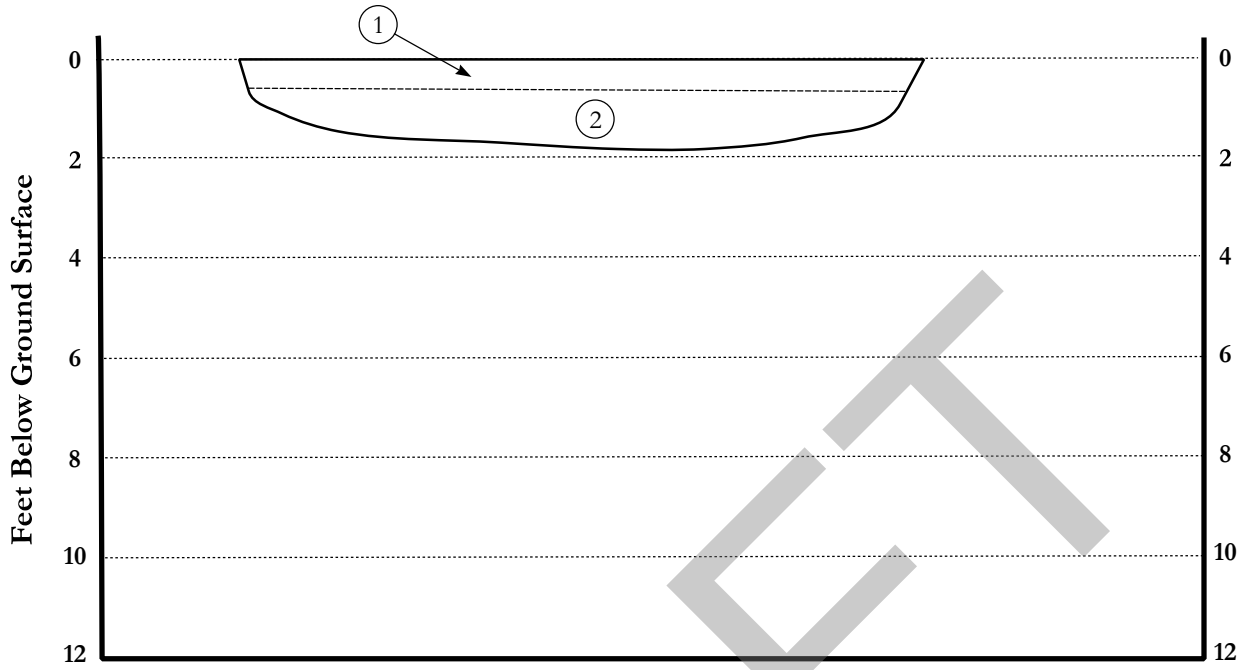
CGI Technical Services Inc.

Project No.: 13-1629.26

TEST PIT TP-7
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate No.
A-4.7

LOG OF TEST PIT



Soil Descriptions	
1	Sandy SILT (ML), dark brown, dry, dense, fine grained with numerous fine pores and moderate fine roots. Grass covered.
2	SANDSTONE (rx), medium brown, damp, moderately weathered, fine grained. slightly hard, poorly indurated.

Date Logged:	February 7, 2014	Excavated With:	Caterpillar 430D
Logged by:	Jim Bianchin	Backfilled With:	Excavated Cuttings
Excavator:	Elite Engineering	Depth to Water (ft):	Not Encountered

DRAFT

CGI Technical Services Inc.

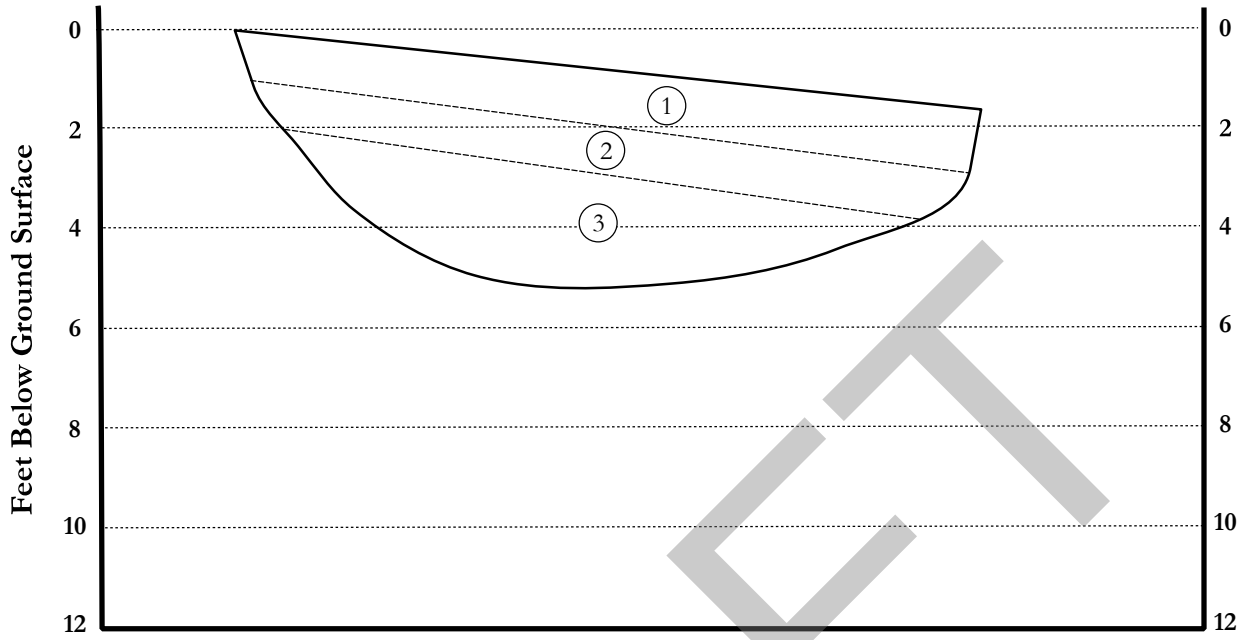
Project No.: 13-1629.26

TEST PIT TP-8
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMACOUNTY, CALIFORNIA

Plate No.

A-4.8

LOG OF TEST PIT



Soil Descriptions	
1	ARTIFICIAL FILL (af) Sandy GRAVEL (GW), grey, dry, loose, fine to coarse grained with subrounded to rounded fine to coarse greavel, interbedded with Clayey SAND (SC), moderate brown, damp, loose, fine to medium grained, sligtly plastic.
2	Sandy SILT (ML), dark brown, dry, slightly dense, fine grained, with trace to moderate fine pores.
3	Sandy SILTSTONE (rx), modertae brown, dry, slightly hard, poorly indurated, fine grained, highly weathered.

Date Logged:	February 7, 2014	Excavated With:	Caterpillar 430D
Logged by:	Jim Bianchin	Backfilled With:	Excavated Cuttings
Excavator:	Elite Engineering	Depth to Water (ft):	Not Encountered

DRAFT

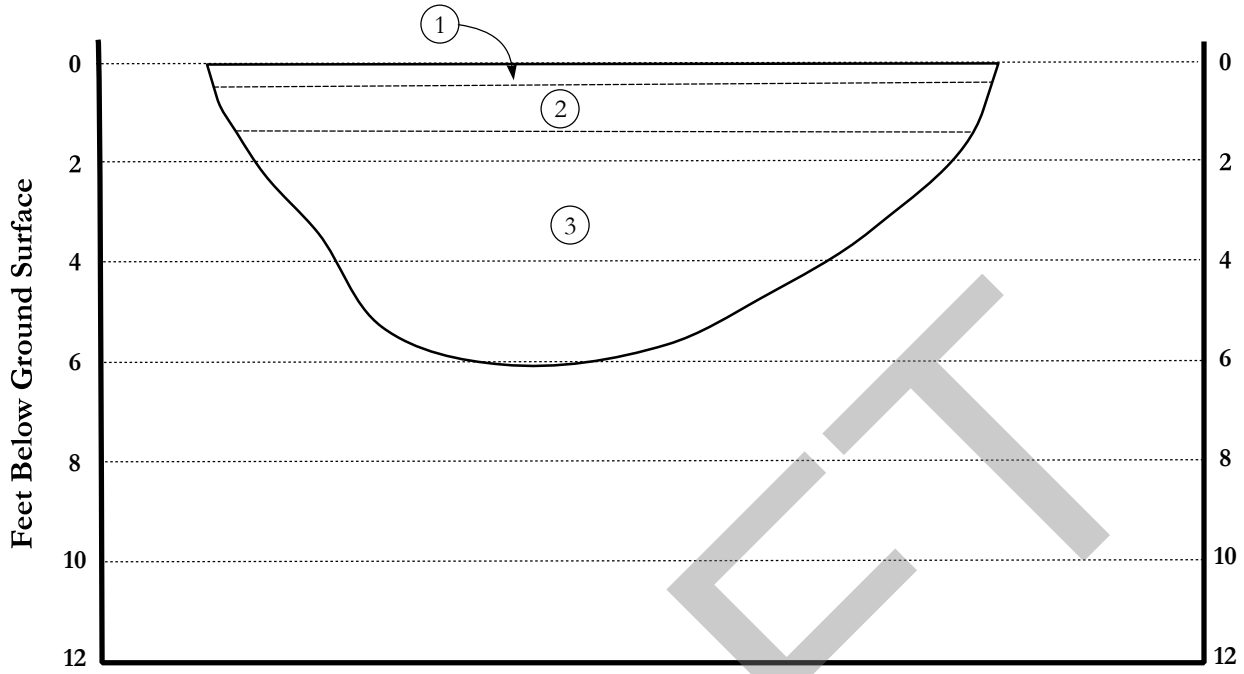
CGI Technical Services Inc.

Project No.: 13-1629.26

TEST PIT TP-9
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate No.
A-4.9

LOG OF TEST PIT



Soil Descriptions	
1	Sandy SILT (ML), dark brown, dry, slightly dense, fine grained, with trace to moderate fine pores.
2	Sandy SILTSTONE (rx), modertae brown, dry, very dense, slightly hard, poorly indurated, fine grained, highly weathered.
3	SILTSTONE (rx), modertae brown to moderate greyish brown, damp, very dense, slightly hard, poorly indurated, fine grained, highly weathered.

Date Logged:	February 7, 2014	Excavated With:	Caterpillar 430D
Logged by:	Jim Bianchin	Backfilled With:	Excavated Cuttings
Excavator:	Elite Engineering	Depth to Water (ft):	Not Encountered

DRAFT

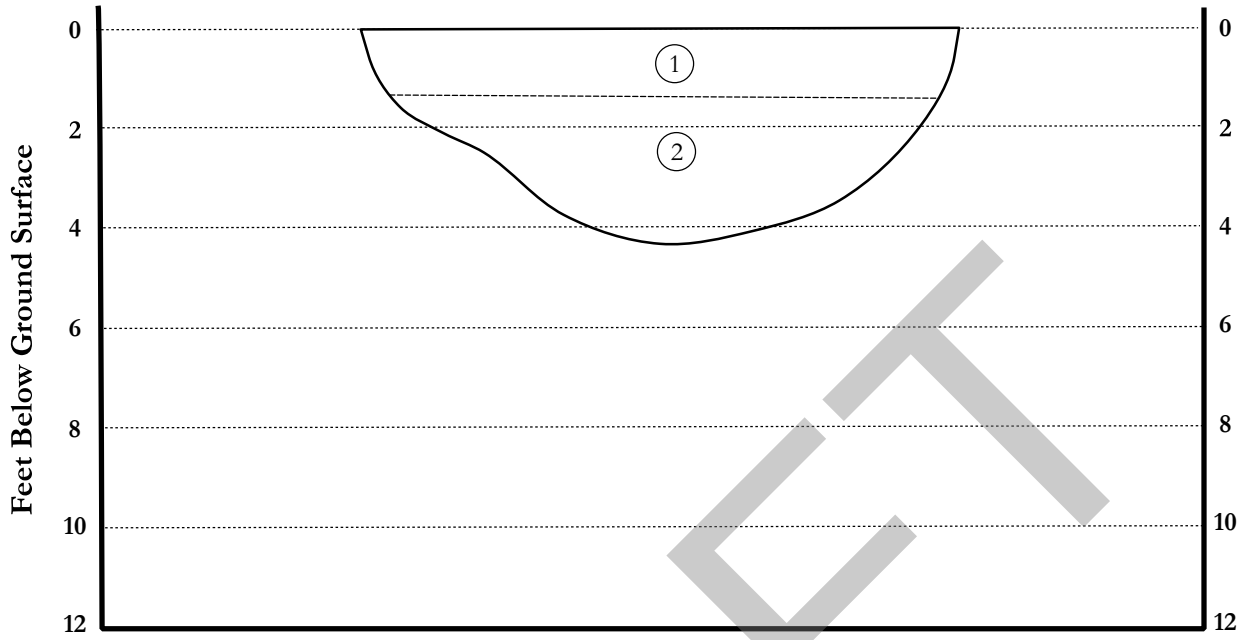
CGI Technical Services Inc.

Project No.: 13-1629.26

TEST PIT TP-10
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate No.
A-4.10

LOG OF TEST PIT



Soil Descriptions	
1	Sandy GRAVEL (GW), moderate brown, dry, very dense, fine to medium grained, with fine to medium subrounded to rounded gravel.
2	Silty SAND (SM), moderate brown to orangish brown, dry, very dense, fine to coarse grained.

Date Logged:	February 7, 2014	Excavated With:	Caterpillar 430D
Logged by:	Jim Bianchin	Backfilled With:	Excavated Cuttings
Excavator:	Elite Engineering	Depth to Water (ft):	Not Encountered

DRAFT

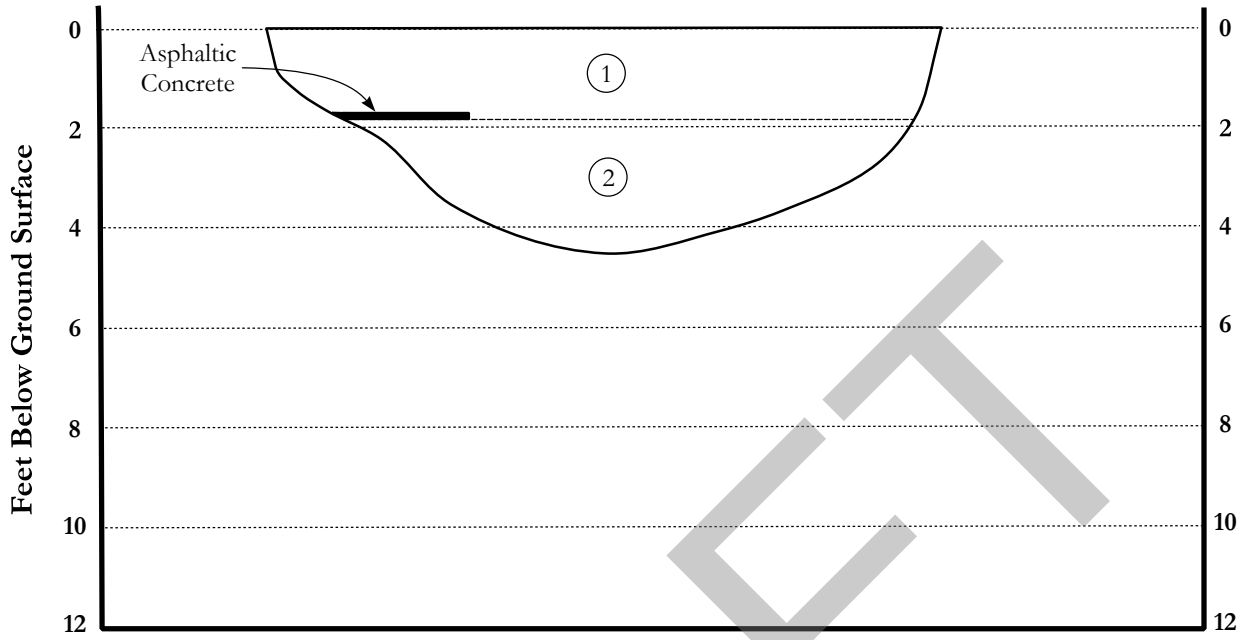
CGI Technical Services Inc.

Project No.: 13-1629.26

TEST PIT TP-11
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate No.
A-4.11

LOG OF TEST PIT



	Soil Descriptions
1	ARTIFICIAL FILL (af) Sandy GRAVEL (GW), medium grey, dry, loose, fine to coarse grained with fine to coarse subrounded to rounded gravel, and local woody debris and asphaltic concrete fragments.
2	Silty SAND (SM), moderate brown to orangish brown, dry, very dense, fine to coarse grained.

Date Logged:	February 7, 2014	Excavated With:	Caterpillar 430D
Logged by:	Jim Bianchin	Backfilled With:	Excavated Cuttings
Excavator:	Elite Engineering	Depth to Water (ft):	Not Encountered

DRAFT

CGI Technical Services Inc.

Project No.: 13-1629.26

TEST PIT TP-12
CALFIRE VINA HELITACK BASE REPLACEMENT
CALIFORNIA DEPARTMENT OF GENERAL SERVICES
TEHAMA COUNTY, CALIFORNIA

Plate No.
A-4.12

APPENDIX B
LABORATORY TESTING

Laboratory Analyses

Laboratory tests were performed on selected bulk soil samples to estimate engineering characteristics of the various earth materials encountered. Testing was performed under procedures described in one of the following references:

- ASTM Standards for Soil Testing, latest revision;
- Lambe, T. William, Soil Testing for Engineers, Wiley, New York, 1951;
- Laboratory Soils Testing, U.S. Army, Office of the Chief of Engineers, Engineering Manual No. 1110-2-1906, November 30, 1970.

Plasticity Index Tests

Atterberg Limits (plastic limit, liquid limit, and plasticity index) tests were performed on four selected samples in accordance with standard test method ASTM D4318. The following samples were found to be nonplastic:

- DH-1 @ 2'
- DH-2 @ 3'
- DH-5 @ 3'

The results for drill hole DH-3 at one to four feet are presented on the drill hole logs and on attached plates labeled *Atterberg Limits Tests*.

Grain Size Distribution

Grain size distribution was determined for three selected soil samples in accordance with standard test method ASTM D422. The grain size distribution data are shown on the attached plate labeled *Laboratory Sieve Analysis*.

In Situ Moisture Density Relations

Dry density estimates and/or moisture content evaluations were performed on selected soil samples collected during this study. Tests were performed using standard test methods ASTM D2216 for moisture content or ASTM D2937 for dry unit weights. The results are presented on the respective Log of Drill holes.

Limited Soil-Chemistry

Two tests were performed on a selected soil samples to evaluate pH, resistivity, chloride and sulfate contents, along with other cations and anions. The results of the tests are presented on the attached *Soil Chemistry* sheet.

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Resistance R-Value Test

One R-value test was performed on a selected bulk sample using standard test method California Test Method 301. The results of the test are presented on the attached plate labeled *R-Value*.

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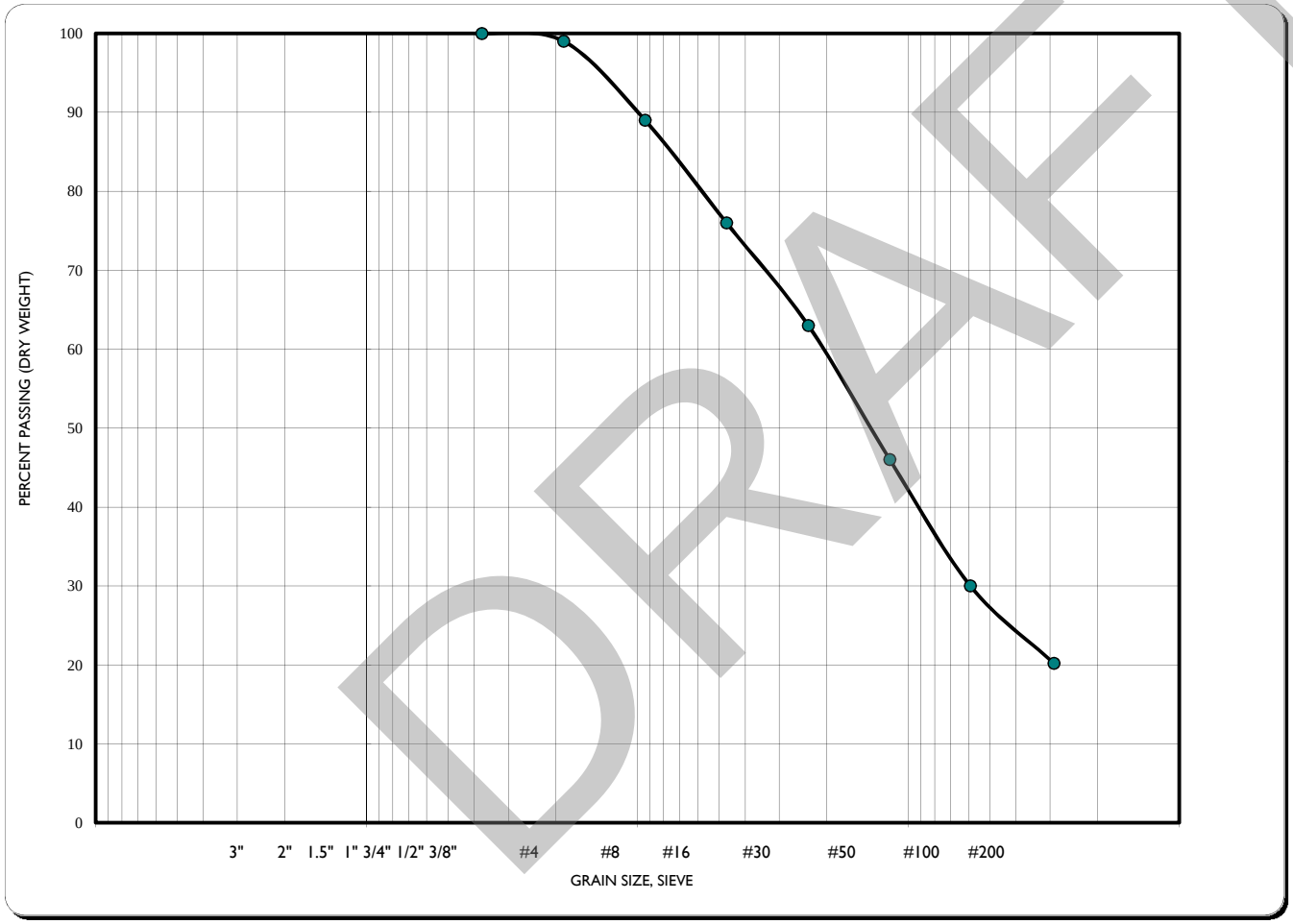
LABORATORY TEST RESULTS

Client: Omni-Means, Ltd.
Project: Vina Helitack Base
Material Type: Clayey Sand
USCS: SC

Sample Location: DH-2 @ 3'
Sampled By: JAB
Tested By: AE

Job No.: 13-1629.26
Lab No.: 7283
Date Received: 9-Jan-14
Date Tested: 29-Jan-14
Date Reviewed: 29-Jan-14



SIEVE ANALYSIS

Sieve Size Standard	Grain Size (mm)	Percent Passing
6	150.00	
3	75.00	
1.5	37.50	
1"	25.00	
3/4"	19.00	
1/2"	12.50	
3/8"	9.50	100
#4	4.75	99
#8	2.36	89
#16	1.18	76
#30	600um	63
#50	300um	46
#100	150um	30
#200	75um	20.2

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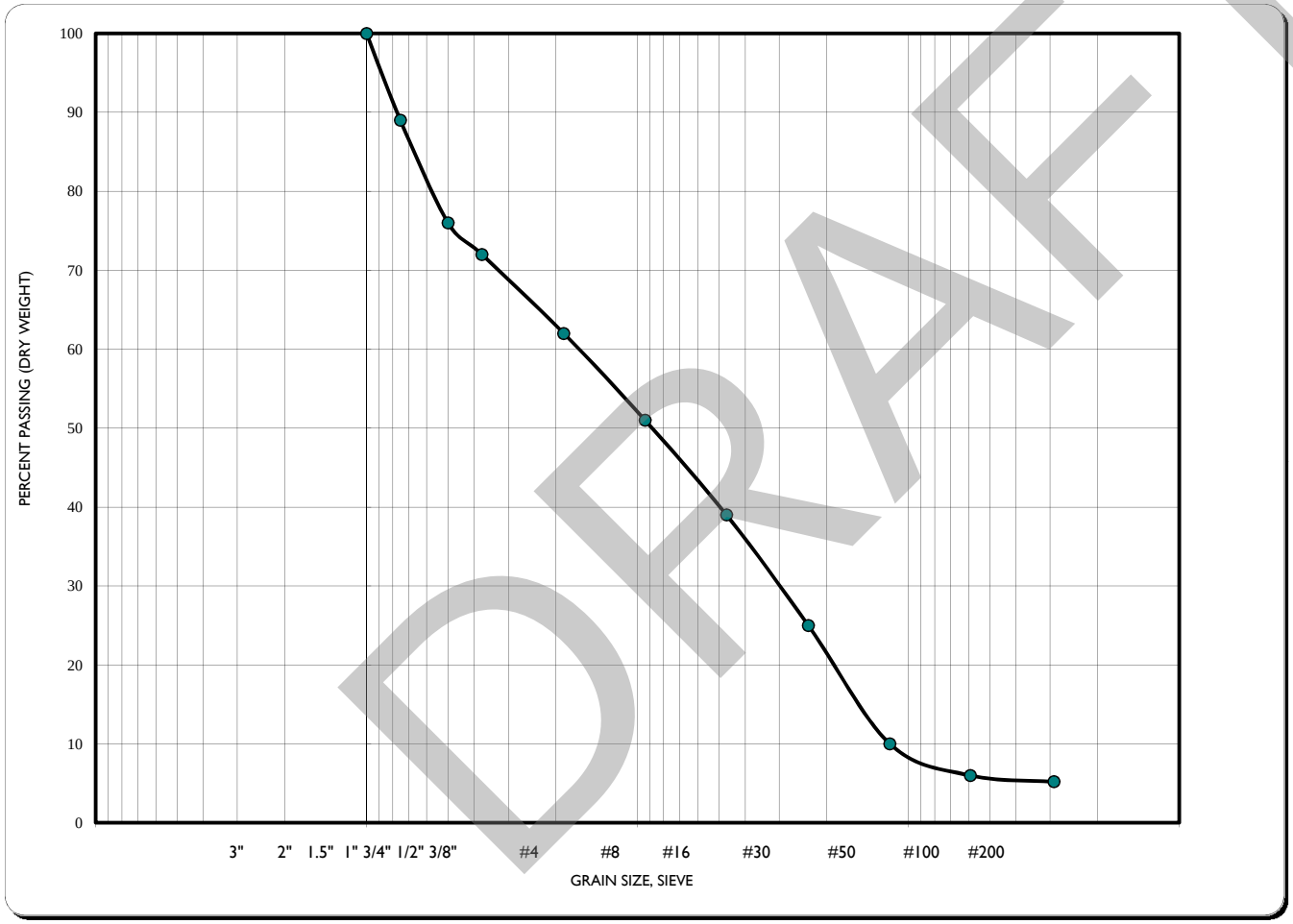
LABORATORY TEST RESULTS

Client: Omni-Means, Ltd.
Project: Vina Helitack Base
Material Type: Silty Sand
USCS: SM

Sample Location: DH-1 @ 2'
Sampled By: JAB
Tested By: AE

Job No.: 13-1629.26
Lab No.: 7283
Date Received: 9-Jan-14
Date Tested: 29-Jan-14
Date Reviewed: 29-Jan-14



SIEVE ANALYSIS		
Sieve Size Standard	Grain Size (mm)	Percent Passing
6	150.00	
3	75.00	
1.5	37.50	
1"	25.00	100
3/4"	19.00	89
1/2"	12.50	76
3/8"	9.50	72
#4	4.75	62
#8	2.36	51
#16	1.18	39
#30	600um	25
#50	300um	10
#100	150um	6
#200	75um	5.2

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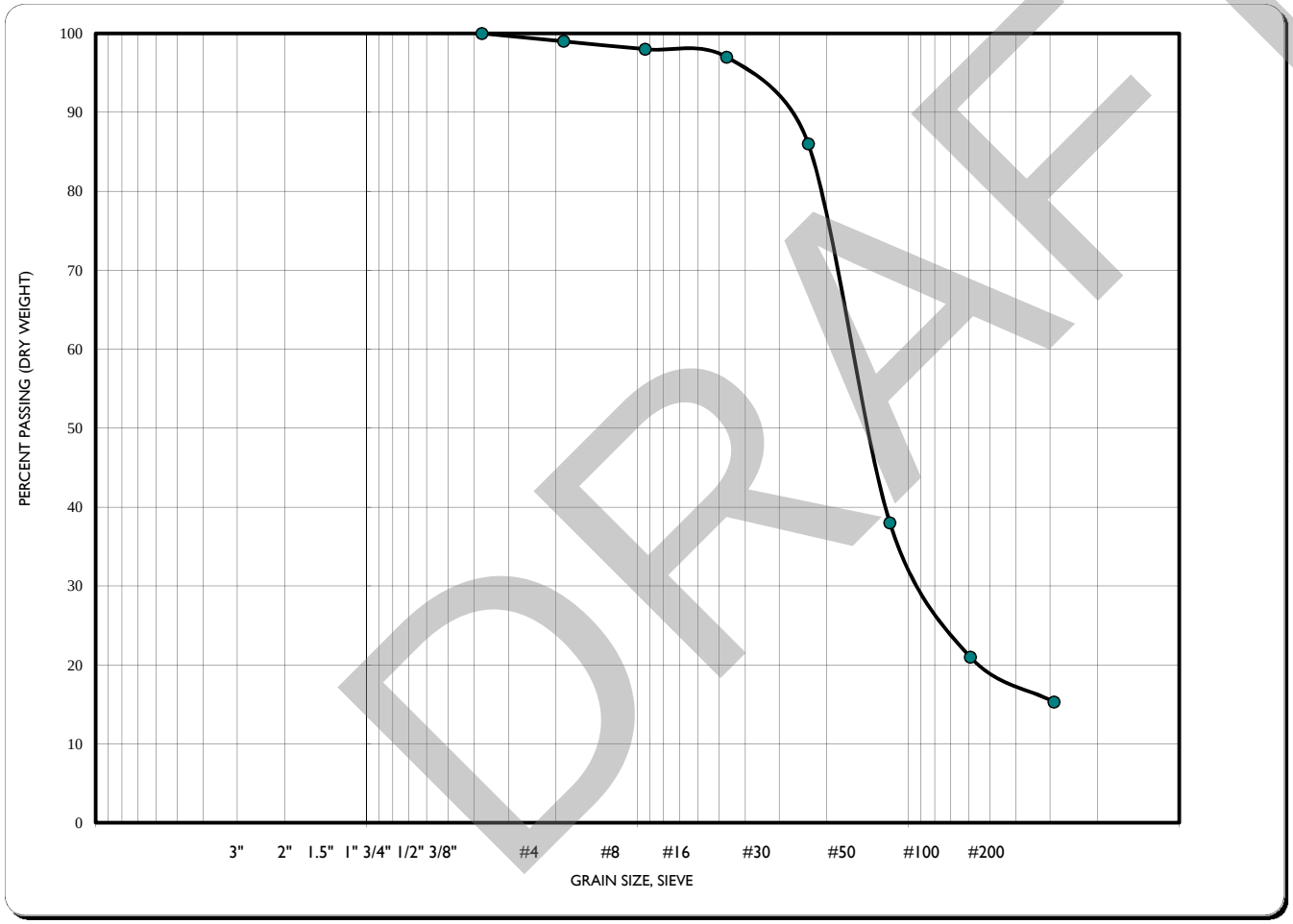
LABORATORY TEST RESULTS

Client: Omni-Means, Ltd.
Project: Vina Helitack Base
Material Type: Silty Sand
USCS: SM

Sample Location: DH-6 @ 5'
Sampled By: JAB
Tested By: AE

Job No.: 13-1629.26
Lab No.: 7283
Date Received: 10-Jan-14
Date Tested: 29-Jan-14
Date Reviewed: 29-Jan-14



SIEVE ANALYSIS		
Sieve Size Standard	Grain Size (mm)	Percent Passing
6	150.00	
3	75.00	
1.5	37.50	
1"	25.00	
3/4"	19.00	
1/2"	12.50	
3/8"	9.50	100
#4	4.75	99
#8	2.36	98
#16	1.18	97
#30	600um	86
#50	300um	38
#100	150um	21
#200	75um	15.3

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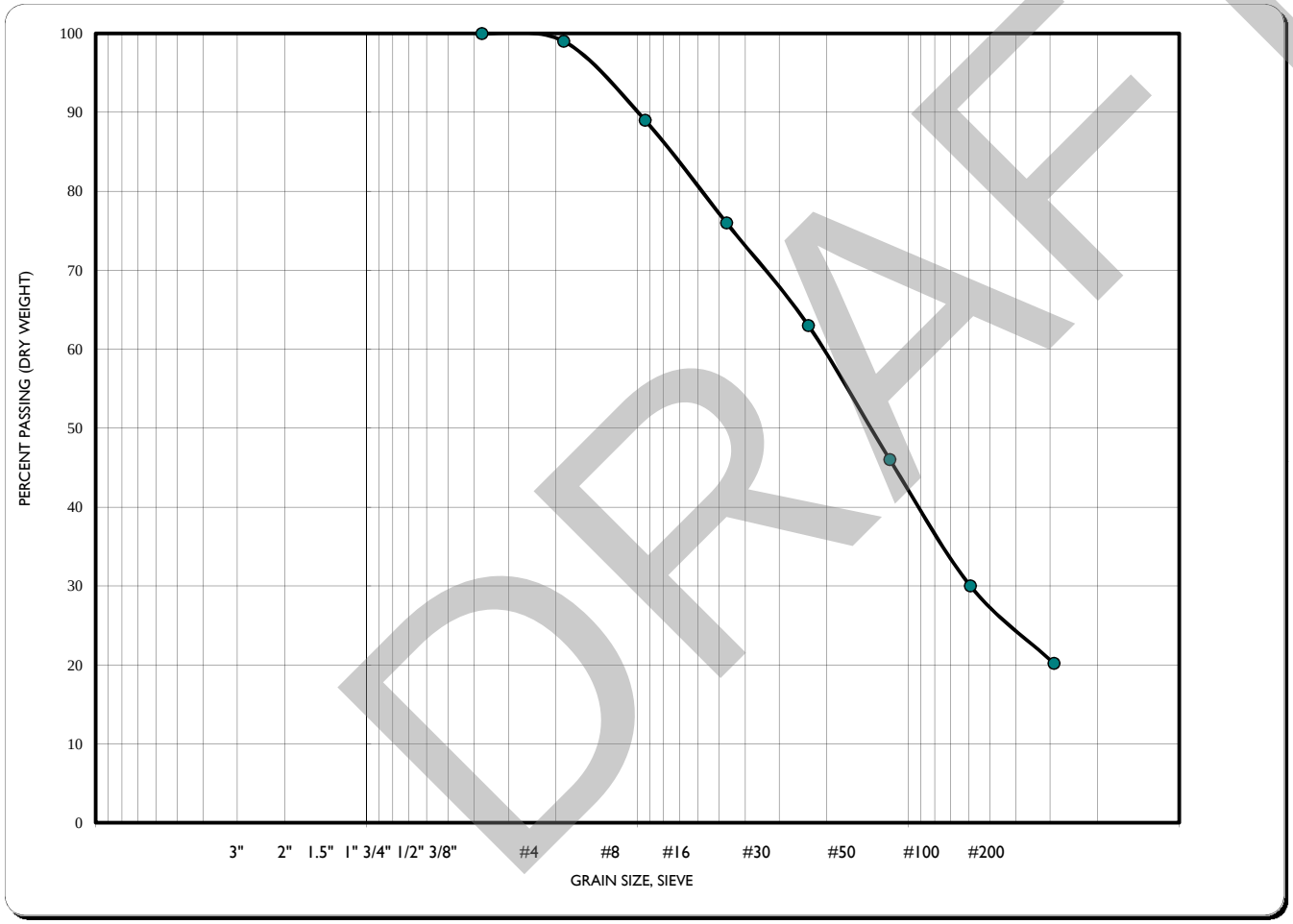
LABORATORY TEST RESULTS

Client: Omni-Means, Ltd.
Project: Vina Helitack Base
Material Type: Clayey Sand
USCS: SC

Sample Location: DH-2 @ 3'
Sampled By: JAB
Tested By: AE

Job No.: 13-1629.26
Lab No.: 7283
Date Received: 9-Jan-14
Date Tested: 29-Jan-14
Date Reviewed: 29-Jan-14



SIEVE ANALYSIS

Sieve Size Standard	Grain Size (mm)	Percent Passing
6	150.00	
3	75.00	
1.5	37.50	
1"	25.00	
3/4"	19.00	
1/2"	12.50	
3/8"	9.50	100
#4	4.75	99
#8	2.36	89
#16	1.18	76
#30	600um	63
#50	300um	46
#100	150um	30
#200	75um	20.2

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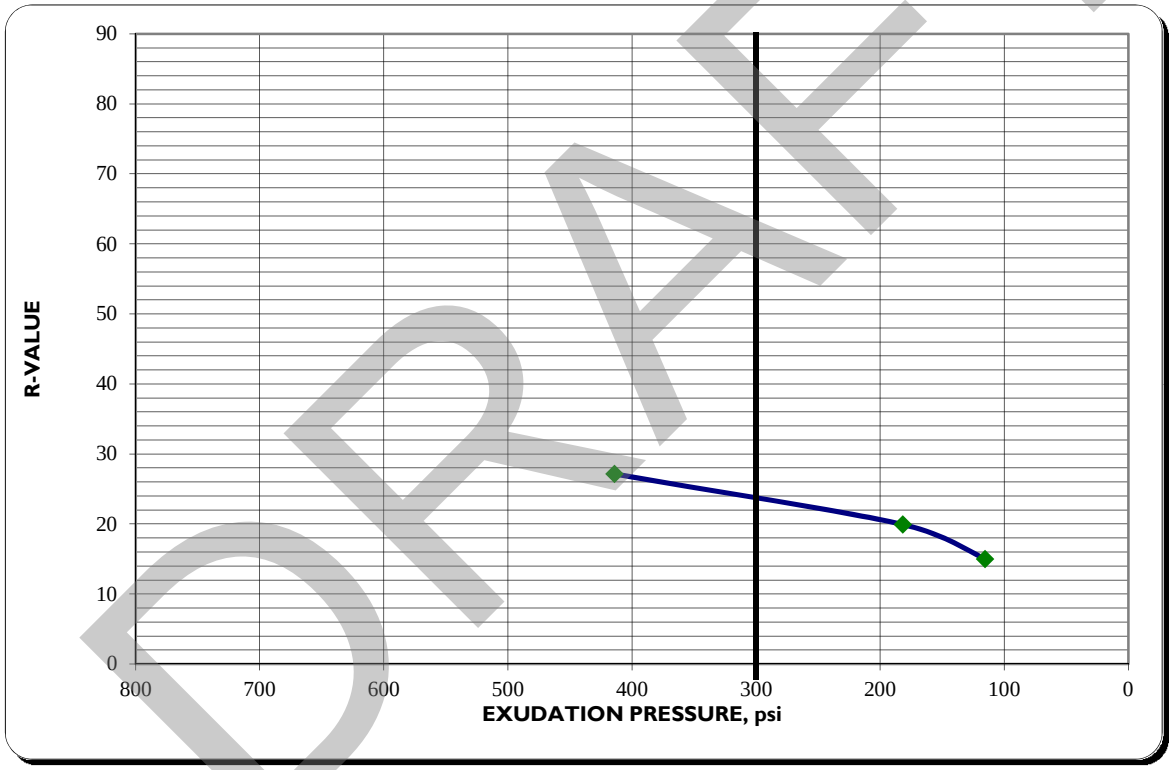
Resistance Value

Client:	Omni-Means Ltd.	**Job No.:**	13-1629.26
Project:	Vina Helitack Base	**Lab No.:**	7285
Location:	Tehama County, California		
Material Type:	Clayey Sand		
Material Supplier:	NA	**Date Sampled:**	01/09/14
Material Source:	Native	**Date Received:**	01/10/14
Sample Location:	DH-1, Sample B1 1-4'	**Date Tested:**	02/07/14
Sampled By:	JAB	**Date Reviewed:**	02/14/14

Test Procedure: Caltrans **Method:** 301



	A	B	C
Moisture (%):	10.3	11.2	12.1
Dry Density (pcf):	115.3	128.3	121.0
Expansion Pressure (psf):	0.0013	0.0011	0.0004
Exudation Pressure (psi):	414	182	115
Resistance Value:	27	20	15

R - VALUE AT 300 PSI EXUDATION PRESSURE	24

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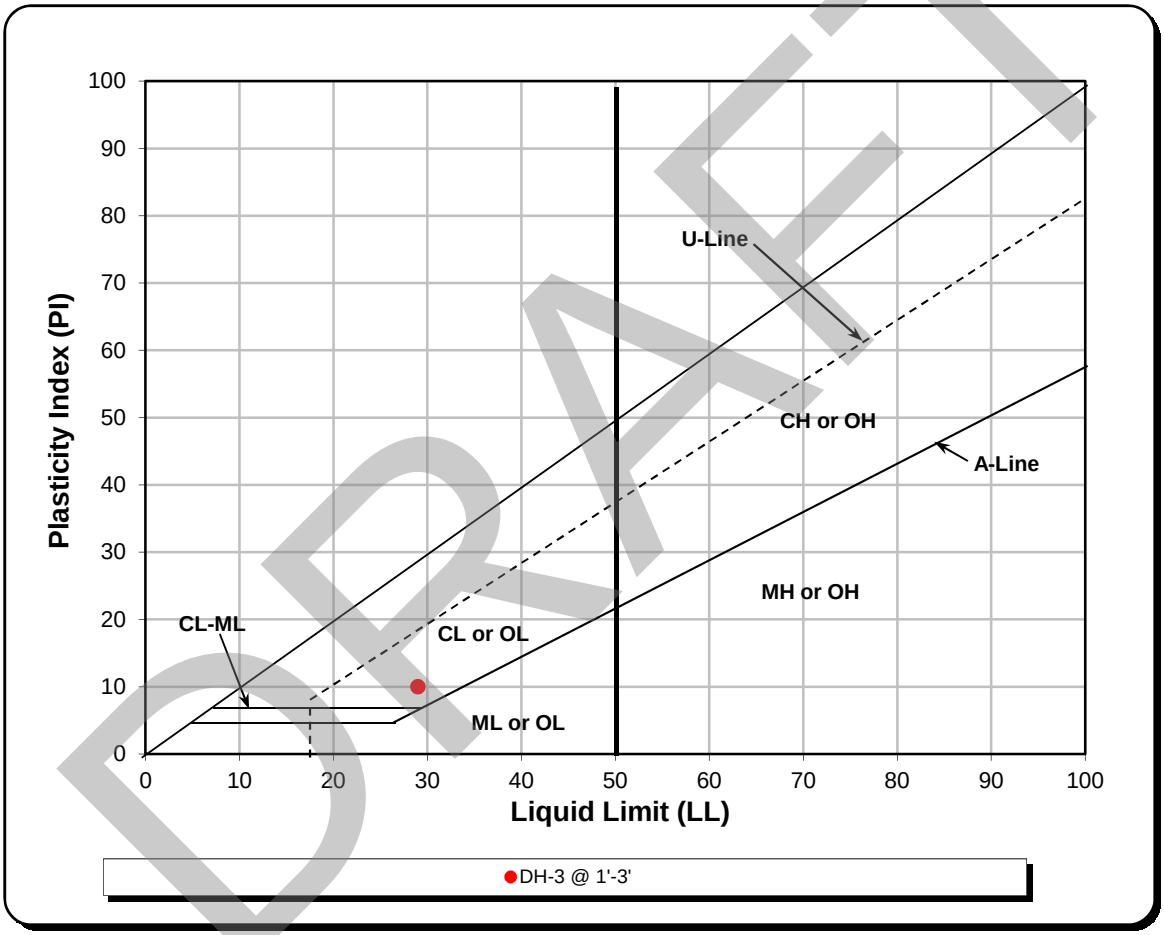
ATTERBERG LIMITS TESTS

Client:	Omni-Means, Ltd.	**Job No.:**	13-1629.26
Project:	Vina Helitack Base	**Lab No.:**	7283
Location:	Tehama County, California		
Sampled By:	JAB	**Date Sampled:**	9-Jan-14
Received By:	PS	**Date Received:**	9-Jan-14
Tested By:	PS	**Date Tested:**	17-Feb-14
Reviewed By:	JAB	**Date Reviewed:**	19-Feb-14



LEGEND			CLASSIFICATION	ATTERBERG LIMITS TEST RESULTS		
Location	Depth, ft	Sample No.		Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)
DH-3	1'-4'	B1	Clayey Sand	29	19	10

ASTM D4318 & D2487

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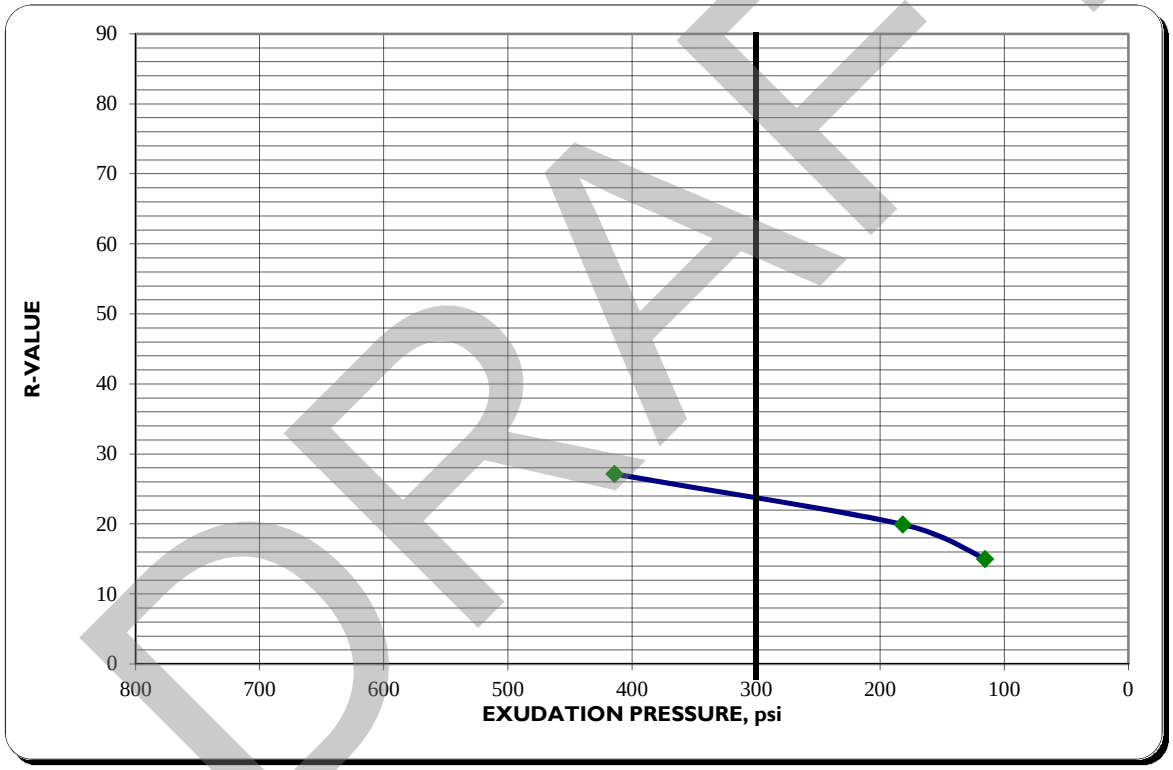
CGI Technical Services Inc.

Resistance Value

Client:	Omni-Means Ltd.	**Job No.:**	13-1629.26
Project:	Vina Helitack Base	**Lab No.:**	7285
Location:	Tehama County, California		
Material Type:	Clayey Sand		
Material Supplier:	NA	**Date Sampled:**	01/09/14
Material Source:	Native	**Date Received:**	01/10/14
Sample Location:	DH-1, Sample B1 1-4'	**Date Tested:**	02/07/14
Sampled By:	JAB	**Date Reviewed:**	02/14/14

Test Procedure: Caltrans **Method:** 301



	A	B	C
Moisture (%):	10.3	11.2	12.1
Dry Density (pcf):	115.3	128.3	121.0
Expansion Pressure (psf):	0.0013	0.0011	0.0004
Exudation Pressure (psi):	414	182	115
Resistance Value:	27	20	15

R - VALUE AT 300 PSI EXUDATION PRESSURE	24

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Table 1 - Laboratory Tests on Soil Samples

CGI Technical Services Inc.
Vina Helitack
Your #13-1629.26, HDR\|Schiff #14-0044LAB
22-Jan-14

Sample ID			DH-5 B1 @ 1-3'
Resistivity		**Units**	
as-received		ohm-cm	27,200
saturated		ohm-cm	5,200
pH			7.0
Electrical Conductivity		mS/cm	0.02
Chemical Analyses			
Cations			
calcium	Ca^{2+}	mg/kg	19
magnesium	Mg^{2+}	mg/kg	6.5
sodium	Na^{1+}	mg/kg	21
potassium	K^{1+}	mg/kg	3.9
Anions			
carbonate	CO_3^{2-}	mg/kg	ND
bicarbonate	HCO_3^{1-}	mg/kg	55
fluoride	F^{1-}	mg/kg	2.8
chloride	Cl^{1-}	mg/kg	1.1
sulfate	SO_4^{2-}	mg/kg	10
phosphate	PO_4^{3-}	mg/kg	1.5
Other Tests			
ammonium	NH_4^{1+}	mg/kg	ND
nitrate	NO_3^{1-}	mg/kg	1.5
sulfide	S^{2-}	qual	na
Redox		mV	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

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United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Tehama County, California

May 20, 2014

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,850 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Tehama County, California
Survey Area Data: Version 7, Dec 3, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 12, 2010—Apr 29, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Tehama County, California (CA645)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Ad	Anita clay	0.8	8.8%
RnB	Redding gravelly loam, 3 to 8 percent slopes	3.5	39.7%
TtB	Tuscan clay loam, 1 to 8 percent slopes	4.5	51.5%
Totals for Area of Interest		**8.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If

intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Tehama County, California

Ad—Anita clay

Map Unit Setting

Elevation: 150 to 1,500 feet
Mean annual precipitation: 30 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 200 to 280 days

Map Unit Composition

Anita and similar soils: 85 percent
Minor components: 15 percent

Description of Anita

Setting

Landform: Basin floors
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from volcanic rock

Typical profile

H1 - 0 to 15 inches: neutral, clay
H2 - 15 to 25 inches: , indurated

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 15 to 25 inches to duripan
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water storage in profile: Very low (about 2.2 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Ecological site: CLAYEY (R015XD001CA)

Minor Components

Keefers

Percent of map unit: 10 percent

Tuscan

Percent of map unit: 5 percent

RnB—Redding gravelly loam, 3 to 8 percent slopes

Map Unit Setting

Elevation: 100 to 1,500 feet
Mean annual precipitation: 14 to 25 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 230 to 320 days

Map Unit Composition

Redding and similar soils: 85 percent
Minor components: 15 percent

Description of Redding

Setting

Landform: Terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from metamorphic and sedimentary rock

Typical profile

H1 - 0 to 13 inches: slightly acid, gravelly loam
H2 - 13 to 23 inches: moderately acid, clay
H3 - 23 to 35 inches: , indurated

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 23 to 35 inches to duripan
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.1 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: GRAVELLY LOAM (R015XD090CA)

Minor Components

Unnamed

Percent of map unit: 5 percent
Landform: Depressions

Corning
Percent of map unit: 4 percent

Red bluff
Percent of map unit: 4 percent

Unnamed
Percent of map unit: 2 percent
Landform: Drainageways

TtB—Tuscan clay loam, 1 to 8 percent slopes

Map Unit Setting
Elevation: 200 to 1,000 feet
Mean annual precipitation: 30 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 225 to 250 days

Map Unit Composition
Tuscan and similar soils: 85 percent
Minor components: 15 percent

Description of Tuscan

Setting
Landform: Terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from volcanic rock

Typical profile
H1 - 0 to 7 inches: slightly acid, clay loam
H2 - 7 to 12 inches: slightly acid, cobbly clay loam
H3 - 12 to 18 inches: neutral, very cobbly clay
H4 - 18 to 22 inches: , indurated

Properties and qualities
Slope: 1 to 8 percent
Depth to restrictive feature: 18 to 22 inches to duripan
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups
Farmland classification: Not prime farmland

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: SHALLOW LOAMY (R017XD086CA)

Minor Components

Inks
Percent of map unit: 5 percent

Keefers
Percent of map unit: 5 percent

Anita
Percent of map unit: 5 percent
Landform: Depressions

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Building Site Development

Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Dwellings Without Basements

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper.

The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification of the soil. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not

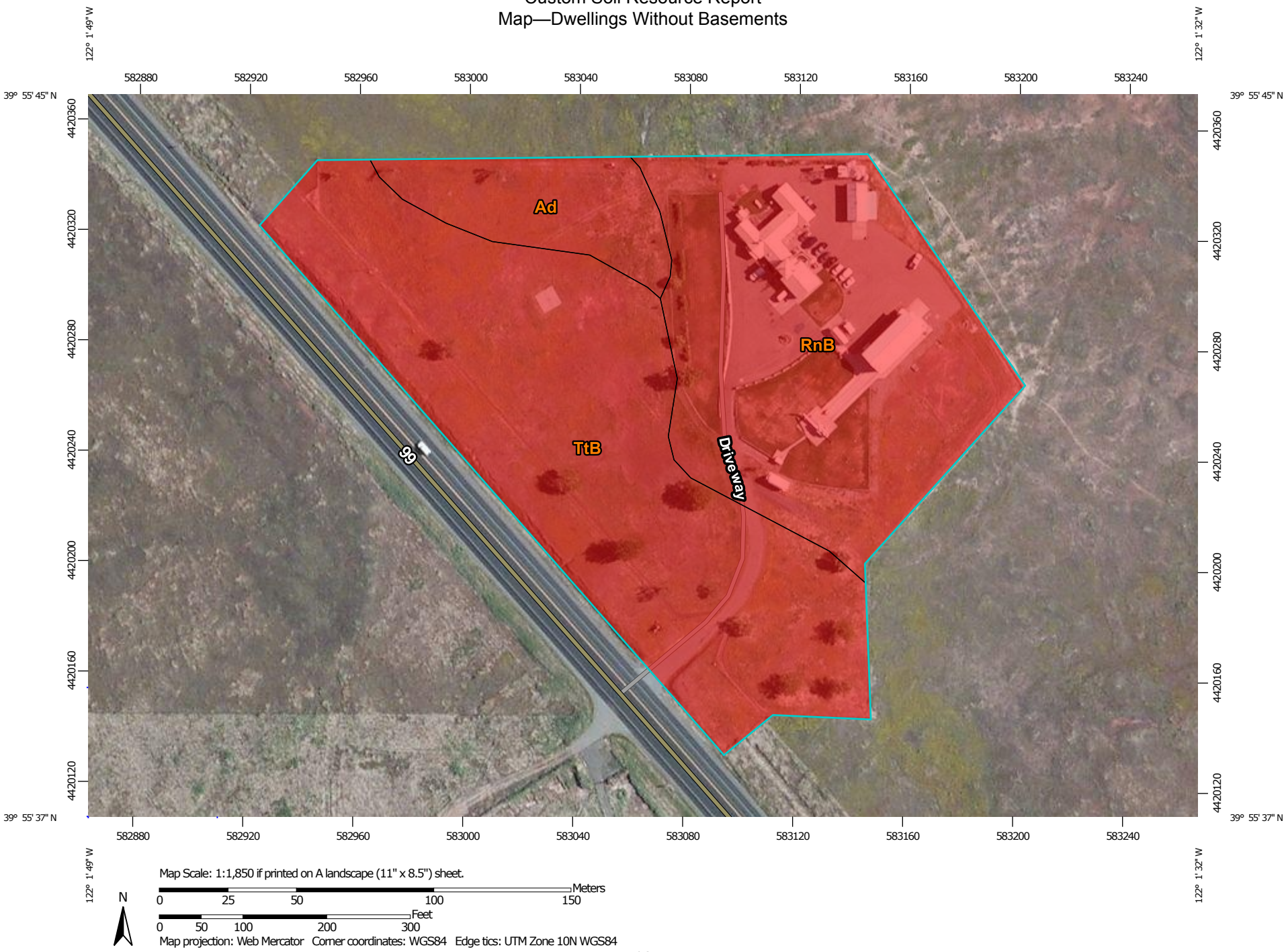
limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Dwellings Without Basements



Map Scale: 1:1,850 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Lines

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Points

Very limited

Somewhat limited

Not limited

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Tehama County, California
Survey Area Data: Version 7, Dec 3, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 12, 2010—Apr 29, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Dwellings Without Basements

Dwellings Without Basements— Summary by Map Unit — Tehama County, California (CA645)						
Map unit symbol	**Map unit name**	**Rating**	**Component name (percent)**	**Rating reasons (numeric values)**	**Acres in AOI**	**Percent of AOI**
Ad	Anita clay	Very limited	Anita (85%)	Ponding (1.00)	0.8	8.8%
				Depth to saturated zone (1.00)		
				Shrink-swell (1.00)		
RnB	Redding gravelly loam, 3 to 8 percent slopes	Very limited	Redding (85%)	Shrink-swell (1.00)	3.5	39.7%
TtB	Tuscan clay loam, 1 to 8 percent slopes	Very limited	Tuscan (85%)	Shrink-swell (1.00)	4.5	51.5%
Totals for Area of Interest					**8.7**	**100.0%**

Dwellings Without Basements— Summary by Rating Value		
Rating	**Acres in AOI**	**Percent of AOI**
Very limited	8.7	100.0%
Totals for Area of Interest	**8.7**	**100.0%**

Rating Options—Dwellings Without Basements

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

California Revised Storie Index (CA)

The Storie Index is a soil rating based on soil properties that govern a soil's potential for cultivated agriculture in California.

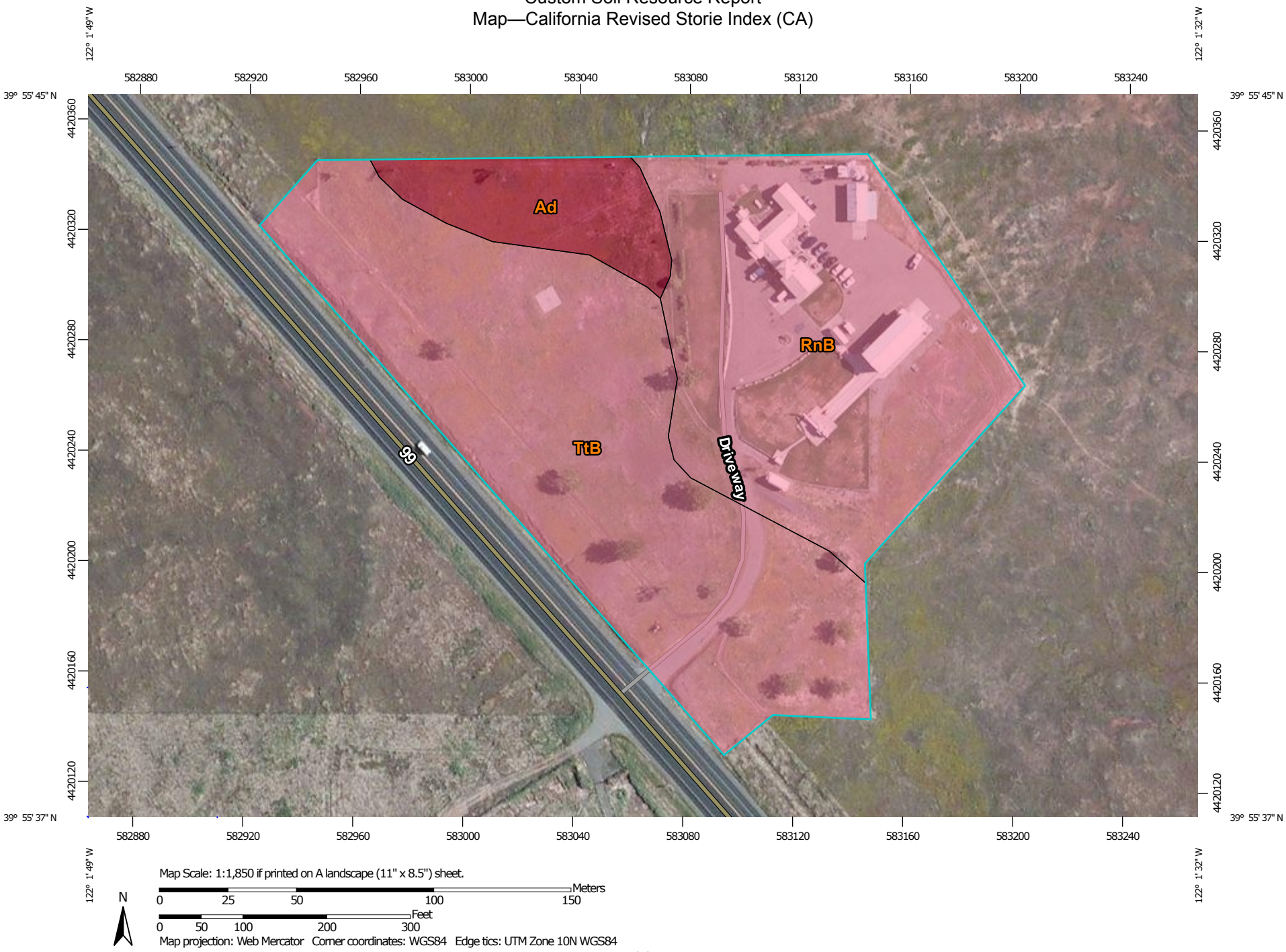
The Storie Index assesses the productivity of a soil from the following four characteristics: Factor A, degree of soil profile development; factor B, texture of the surface layer; factor C, slope; and factor X, manageable features, including drainage, microrelief, fertility, acidity, erosion, and salt content. A score ranging from 0 to 100 percent is determined for each factor, and the scores are then multiplied together to derive an index rating.

For simplification, Storie Index ratings have been combined into six grade classes as follows: Grade 1 (excellent), 100 to 80; grade 2 (good), 79 to 60; grade 3 (fair), 59 to 40; grade 4 (poor), 39 to 20; grade 5 (very poor), 19 to 10; and grade 6 (nonagricultural), less than 10.

The components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as the one shown for the map unit. The percent composition of each component in a particular map unit is given to help the user better understand the extent to which the rating applies to the map unit.

Other components with different ratings may occur in each map unit. The ratings for all components, regardless the aggregated rating of the map unit, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Map—California Revised Storie Index (CA)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Grade One - Excellent

Grade Two - Good

Grade Three - Fair

Grade Four - Poor

Grade Five - Very Poor

Grade Six - Nonagricultural

Not rated

Not rated or not available

Soil Rating Lines

Grade One - Excellent

Grade Two - Good

Grade Three - Fair

Grade Four - Poor

Grade Five - Very Poor

Grade Six - Nonagricultural

Not rated

Not rated or not available

Soil Rating Points

Grade One - Excellent

Grade Two - Good

Grade Three - Fair

Grade Four - Poor

Grade Five - Very Poor

Grade Six - Nonagricultural

Not rated

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Tehama County, California
Survey Area Data: Version 7, Dec 3, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 12, 2010—Apr 29, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—California Revised Storie Index (CA)

California Revised Storie Index (CA)— Summary by Map Unit — Tehama County, California (CA645)					
Map unit symbol	**Map unit name**	**Rating**	**Component name (percent)**	**Acres in AOI**	**Percent of AOI**
Ad	Anita clay	Grade Six - Nonagricultural	Anita (85%)	0.8	8.8%
RnB	Redding gravelly loam, 3 to 8 percent slopes	Grade Five - Very Poor	Redding (85%)	3.5	39.7%
TtB	Tuscan clay loam, 1 to 8 percent slopes	Grade Five - Very Poor	Tuscan (85%)	4.5	51.5%
Totals for Area of Interest				**8.7**	**100.0%**

Rating Options—California Revised Storie Index (CA)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Farmland Classification

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Map—Farmland Classification

Map Scale: 1:1,850 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Points

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Water Features

MAP INFORMATION

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Tehama County, California
Survey Area Data: Version 7, Dec 3, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 12, 2010—Apr 29, 2012

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Table—Farmland Classification

Farmland Classification— Summary by Map Unit — Tehama County, California (CA645)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
Ad	Anita clay	Not prime farmland	0.8	8.8%
RnB	Redding gravelly loam, 3 to 8 percent slopes	Not prime farmland	3.5	39.7%
TtB	Tuscan clay loam, 1 to 8 percent slopes	Not prime farmland	4.5	51.5%
Totals for Area of Interest			**8.7**	**100.0%**

Rating Options—Farmland Classification

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Land Management

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid trails, equipment operability, site preparation, suitability for hand and mechanical planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

Erosion Hazard (Off-Road, Off-Trail)

The ratings in this interpretation indicate the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. The ratings are based on slope and soil erosion factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Erosion Hazard (Off-Road, Off-Trail)

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Very severe

Severe

Moderate

Slight

Not rated or not available

Soil Rating Lines

Very severe

Severe

Moderate

Slight

Not rated or not available

Soil Rating Points

Very severe

Severe

Moderate

Slight

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Tehama County, California
Survey Area Data: Version 7, Dec 3, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 12, 2010—Apr 29, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Erosion Hazard (Off-Road, Off-Trail)

Erosion Hazard (Off-Road, Off-Trail)— Summary by Map Unit — Tehama County, California (CA645)						
Map unit symbol	**Map unit name**	**Rating**	**Component name (percent)**	**Rating reasons (numeric values)**	**Acres in AOI**	**Percent of AOI**
Ad	Anita clay	Slight	Anita (85%)		0.8	8.8%
RnB	Redding gravelly loam, 3 to 8 percent slopes	Slight	Redding (85%)		3.5	39.7%
TtB	Tuscan clay loam, 1 to 8 percent slopes	Slight	Tuscan (85%)		4.5	51.5%
Totals for Area of Interest					**8.7**	**100.0%**

Erosion Hazard (Off-Road, Off-Trail)— Summary by Rating Value		
Rating	**Acres in AOI**	**Percent of AOI**
Slight	8.7	100.0%
Totals for Area of Interest	**8.7**	**100.0%**

Rating Options—Erosion Hazard (Off-Road, Off-Trail)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Erosion Hazard (Road, Trail)

The ratings in this interpretation indicate the hazard of soil loss from unsurfaced roads and trails. The ratings are based on soil erosion factor K, slope, and content of rock fragments.

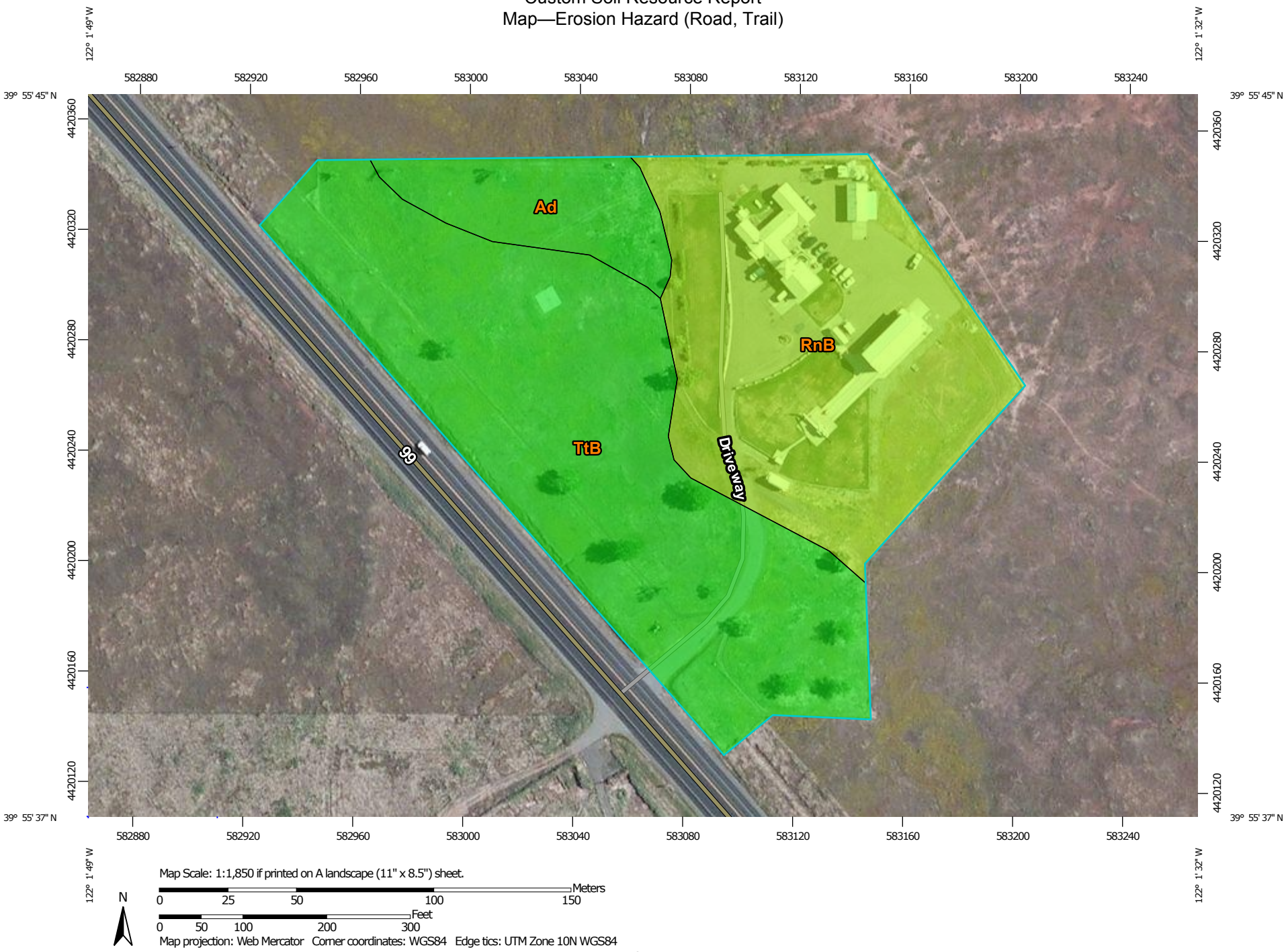
The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," or "severe." A rating of "slight" indicates that little or no erosion is likely; "moderate" indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and "severe" indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Map—Erosion Hazard (Road, Trail)



Map Scale: 1:1,850 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Very severe

Severe

Moderate

Slight

Not rated or not available

Soil Rating Lines

Very severe

Severe

Moderate

Slight

Not rated or not available

Soil Rating Points

Very severe

Severe

Moderate

Slight

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Tehama County, California
Survey Area Data: Version 7, Dec 3, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 12, 2010—Apr 29, 2012

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Tables—Erosion Hazard (Road, Trail)

Erosion Hazard (Road, Trail)— Summary by Map Unit — Tehama County, California (CA645)						
Map unit symbol	**Map unit name**	**Rating**	**Component name (percent)**	**Rating reasons (numeric values)**	**Acres in AOI**	**Percent of AOI**
Ad	Anita clay	Slight	Anita (85%)		0.8	8.8%
RnB	Redding gravelly loam, 3 to 8 percent slopes	Moderate	Redding (85%)	Slope/erodibility (0.50)	3.5	39.7%
TtB	Tuscan clay loam, 1 to 8 percent slopes	Slight	Tuscan (85%)		4.5	51.5%
Totals for Area of Interest					**8.7**	**100.0%**

Erosion Hazard (Road, Trail)— Summary by Rating Value		
Rating	**Acres in AOI**	**Percent of AOI**
Slight	5.2	60.3%
Moderate	3.5	39.7%
Totals for Area of Interest	**8.7**	**100.0%**

Rating Options—Erosion Hazard (Road, Trail)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

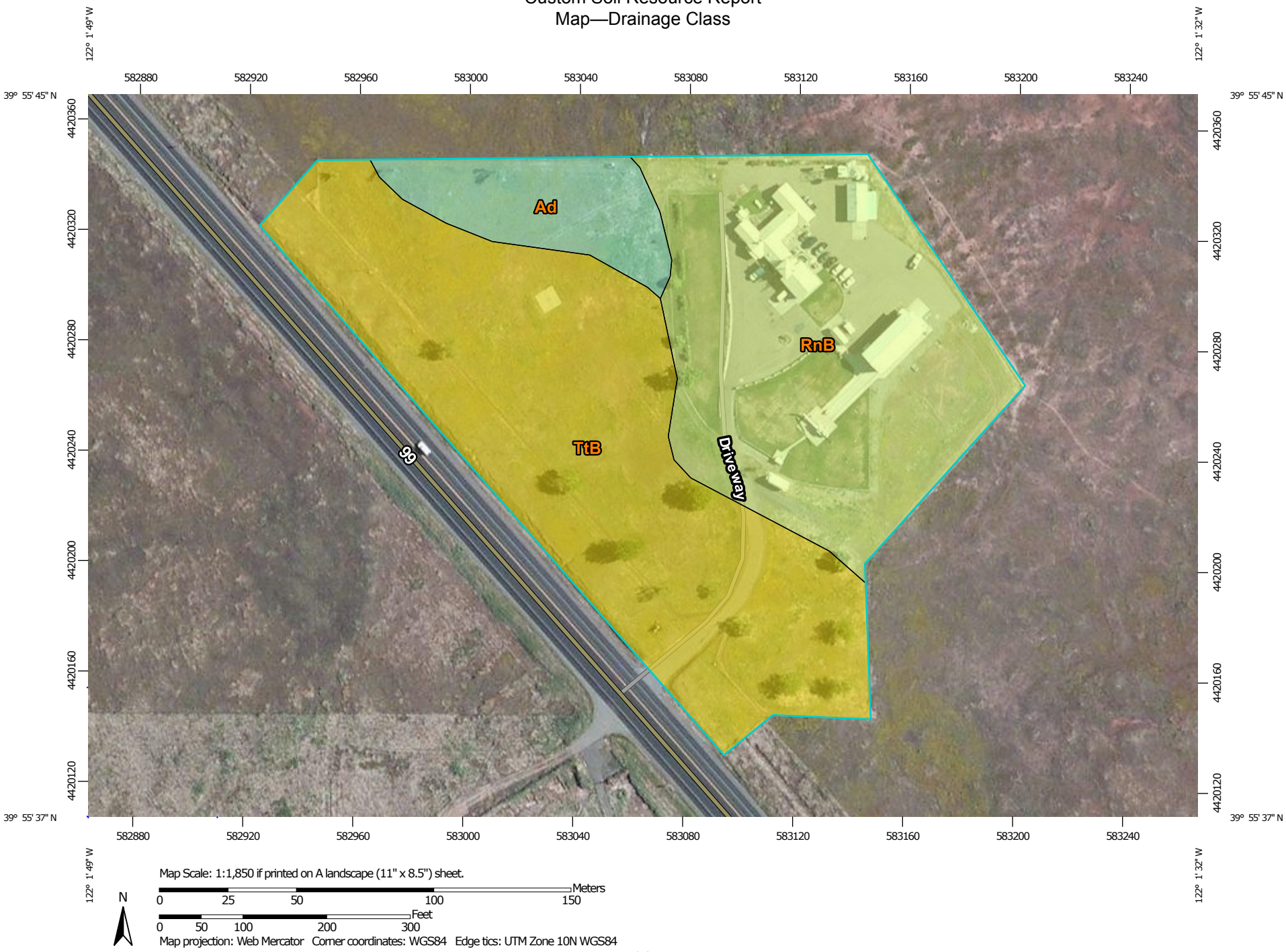
Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Drainage Class

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

Map—Drainage Class



Map Scale: 1:1,850 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Excessively drained

Somewhat excessively drained

Well drained

Moderately well drained

Somewhat poorly drained

Poorly drained

Very poorly drained

Subaqueous

Not rated or not available

Soil Rating Lines

Excessively drained

Somewhat excessively drained

Well drained

Moderately well drained

Somewhat poorly drained

Poorly drained

Very poorly drained

Subaqueous

Not rated or not available

Soil Rating Points

Excessively drained

Somewhat excessively drained

Well drained

Moderately well drained

Somewhat poorly drained

Poorly drained

Very poorly drained

Subaqueous

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Tehama County, California
Survey Area Data: Version 7, Dec 3, 2013

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Date(s) aerial images were photographed: Jun 12, 2010—Apr 29, 2012

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Table—Drainage Class

Drainage Class— Summary by Map Unit — Tehama County, California (CA645)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
Ad	Anita clay	Somewhat poorly drained	0.8	8.8%
RnB	Redding gravelly loam, 3 to 8 percent slopes	Moderately well drained	3.5	39.7%
TtB	Tuscan clay loam, 1 to 8 percent slopes	Well drained	4.5	51.5%
Totals for Area of Interest			**8.7**	**100.0%**

Rating Options—Drainage Class

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

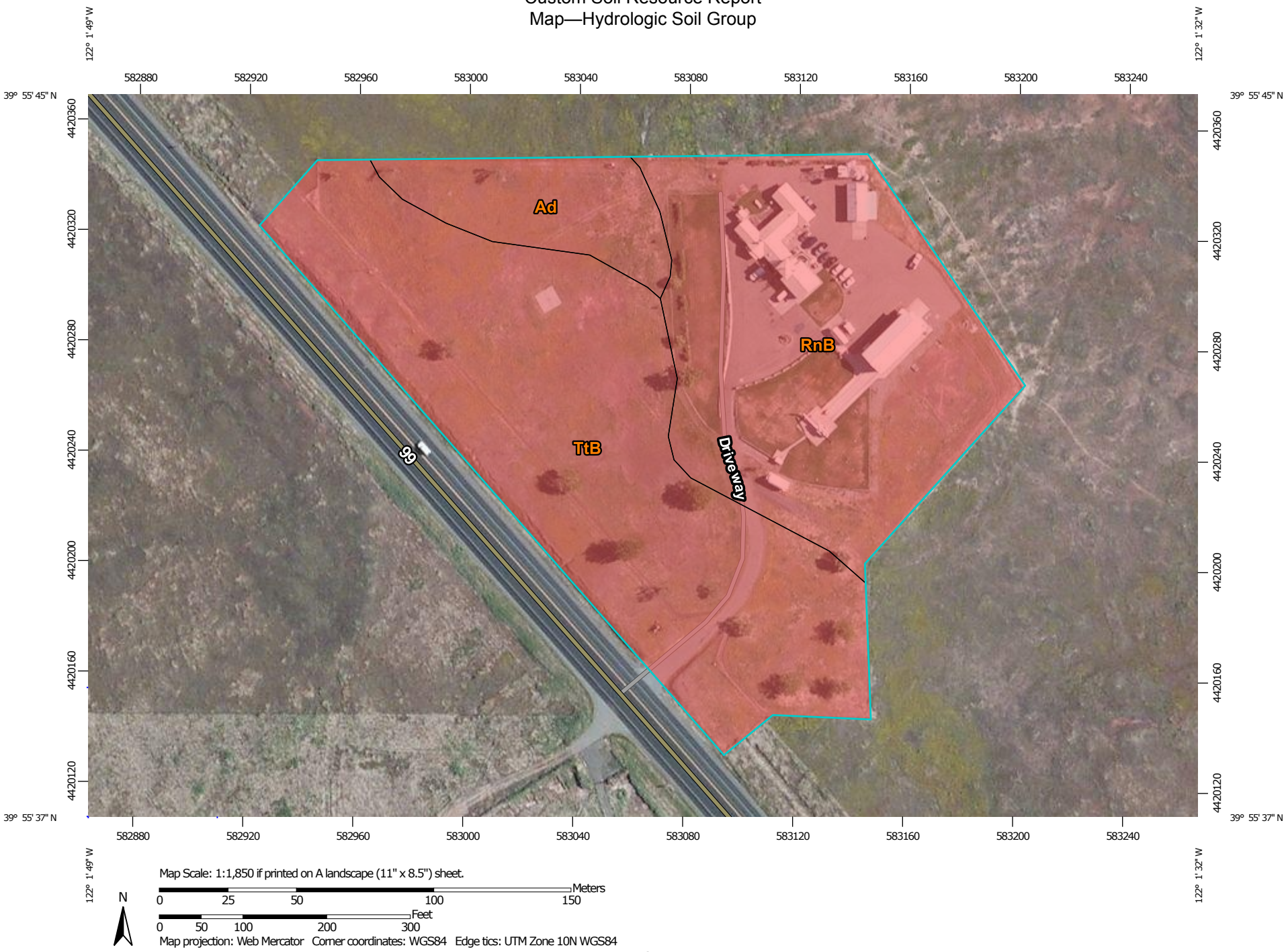
Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the

surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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Survey Area Data: Version 7, Dec 3, 2013

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Date(s) aerial images were photographed: Jun 12, 2010—Apr 29, 2012

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Table—Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Tehama County, California (CA645)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
Ad	Anita clay	D	0.8	8.8%
RnB	Redding gravelly loam, 3 to 8 percent slopes	D	3.5	39.7%
TtB	Tuscan clay loam, 1 to 8 percent slopes	D	4.5	51.5%
Totals for Area of Interest			**8.7**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Water Features

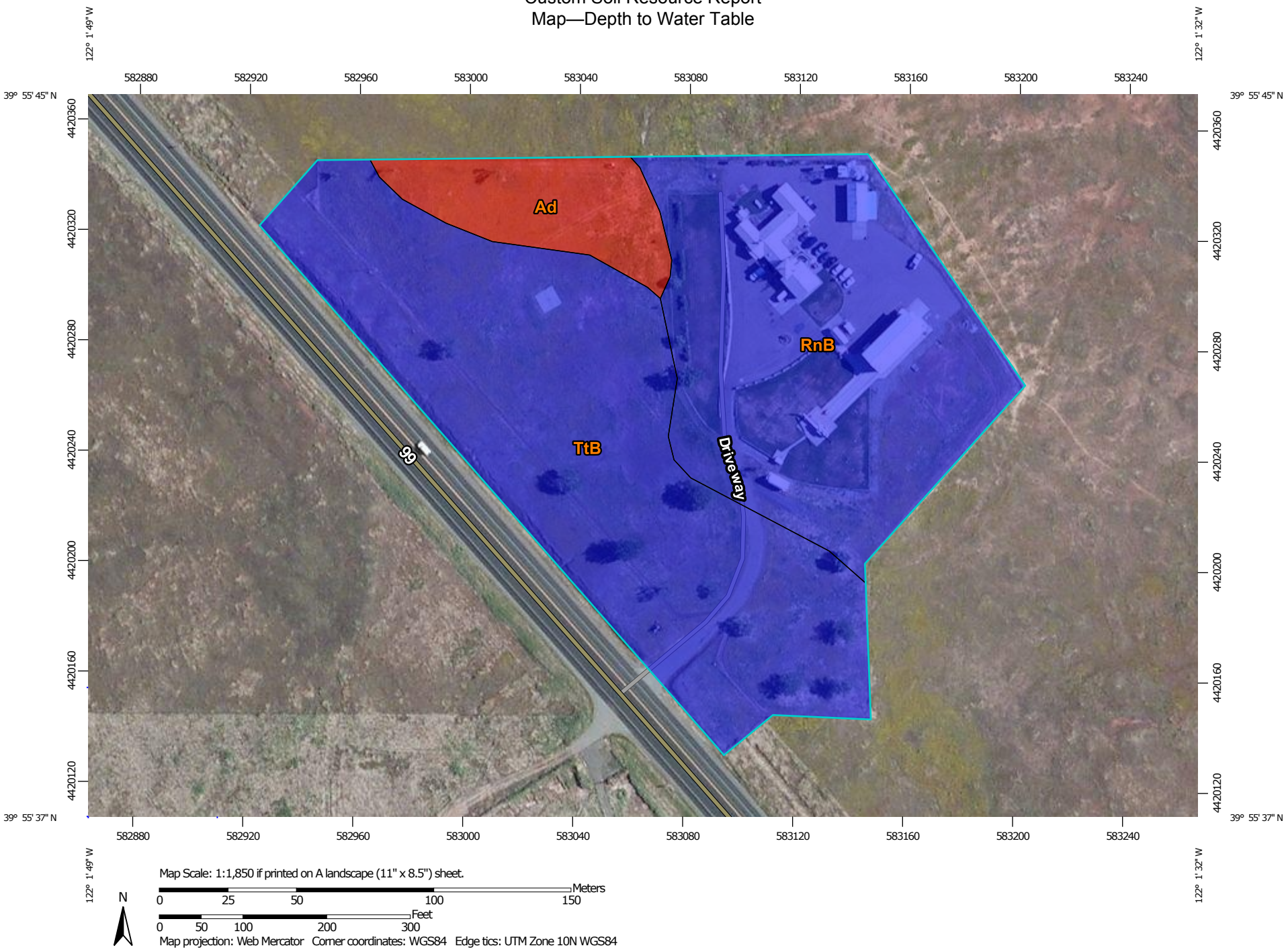
Water Features include ponding frequency, flooding frequency, and depth to water table.

Depth to Water Table

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Depth to Water Table



Map Scale: 1:1,850 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Lines

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Points

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

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Date(s) aerial images were photographed: Jun 12, 2010—Apr 29, 2012

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Table—Depth to Water Table

Depth to Water Table— Summary by Map Unit — Tehama County, California (CA645)				
Map unit symbol	**Map unit name**	**Rating (centimeters)**	**Acres in AOI**	**Percent of AOI**
Ad	Anita clay	0	0.8	8.8%
RnB	Redding gravelly loam, 3 to 8 percent slopes	>200	3.5	39.7%
TtB	Tuscan clay loam, 1 to 8 percent slopes	>200	4.5	51.5%
Totals for Area of Interest			**8.7**	**100.0%**

Rating Options—Depth to Water Table

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Water Features

This folder contains tabular reports that present soil hydrology information. The reports (tables) include all selected map units and components for each map unit. Water Features include ponding frequency, flooding frequency, and depth to water table.

Water Features

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

The *months* in the table indicate the portion of the year in which a water table, ponding, and/or flooding is most likely to be a concern.

Water table refers to a saturated zone in the soil. The water features table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Absence of an entry indicates that the data were not estimated. The dash indicates no documented presence.

Water Features–Tehama County, California										
Map unit symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*	*Ft*				
Ad—Anita clay										
Anita Anita	D	High	January	0.0 0.5-1.0	0.5-1.0 0.8-1.7	—	Long	Frequent	—	None
			February	0.0 0.5-1.0	0.5-1.0 0.8-1.7	—	Long	Frequent	—	None
			March	0.0 0.5-1.0	0.5-1.0 0.8-1.7	—	Long	Frequent	—	None
			November	0.0 0.5-1.0	0.5-1.0 0.8-1.7	—	—	None	—	None
			December	0.0 0.5-1.0	0.5-1.0 0.8-1.7	—	Long	Frequent	—	None
RnB—Redding gravelly loam, 3 to 8 percent slopes										
Redding	D	Very high	Jan-Dec	—	—	—	—	None	—	None
TtB—Tuscan clay loam, 1 to 8 percent slopes										
Tuscan	D	Very high	Jan-Dec	—	—	—	—	None	—	None

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APPENDIX F

Hazardous Materials Survey

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HAZARDOUS MATERIALS SURVEY
FINAL REPORT

OWNER/CLIENT

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BUILDING(S) SURVEYED

Main Building and Storage Units
Vina Helitack Base Facility Replacement

PREPARED BY

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Entek Project #14-2959

January 29, 2014

ENTEK

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Executive Summary

The United States Environmental Protection Agency, National Emission Standards for Hazardous Air Pollutants (US EPA NESHAP), 40 CFR Part 61 - Nov. 20, 1990, requires an owner or operator of a demolition or renovation project to thoroughly inspect the affected facility or part of the facility where the demolition or renovation operation will occur for the presence of asbestos-containing materials (ACM) prior to the commencement of that project.

This inspection report was requested by Mr. Kyle Matti, Project Manager with Nichols, Melburg & Rosetto.

The purpose of the inspection was to comply with US EPA NESHAP requirements and the California Air Resources Board (CARB) which has jurisdiction for this project site to determine if asbestos containing materials are present which may be impacted during an upcoming demolition project, which includes the main building, two storage buildings and a small pump house building. It is our understanding the main building was originally constructed in 1952 but burned down and was rebuilt in 1962. A number of renovations have taken place since the original construction date. The building was expanded in 1984 to include two barracks to house fire fighters.

Materials are classified in the tables of this report as regulated asbestos containing material (RACM), Category I (CAT-I) or Category II (CAT-II) ACM, or asbestos containing construction material (ACCM), which included collecting multiple samples of some materials.

This is a summary of the report. The report must be read in its entirety, and the reader must review all the detailed information provided in the body of the report prior to making any interpretations, or conclusions pertaining to the information. Any conclusions made by the reader about the information provided in the body of this report which are contradictory or not included in this report are the responsibility of the reader.

Asbestos

On January 15 & 16, 2014, Entek conducted a survey specific to areas designated by the Owner which included: all interior and exterior areas of the main building, two storage buildings, and a small pump house building. The helicopter hangar and fuel storage tank are to remain and were therefore excluded from this survey. On January 23, 2014, I returned to the site for additional sampling due to inconclusive results.

The results of testing for asbestos during this survey indicate asbestos is present in multiple materials which include: the drywall and joint compound located in the reception area and TV room, the gray mosaic sheet flooring in barracks 1 as well as the adjoining laundry and restroom, the 9" beige floor tile in the TV room (beneath sheet vinyl flooring and carpet) and adjacent closet, the 9" green floor tile in the mezzanine storage (in garage area), the 9" gray floor tile in the lookout tower, the 12" cream with orangish streaks floor tile in the reception area, and all roof mastics. Specifics pertaining to individual materials can be found in later sections of this report.

Lead

Entek investigated existing paints, and applied coatings in an effort to determine if lead was present in these materials. In brief: yellow striping paint on asphalt and concrete, white interior wall and trim paint, interior varnish on wood window sills, exterior dark green paint on concrete at the storage unit south of the main building, tan exterior and interior trim and wall paint, the blue-green paint exterior trim paint, and the dark geen pain on the metal stairs leading to the lookout tower contain more than 5,000 ppm or 1.0 mg/cm^2 lead and are classified as lead-based paint (LBP). Since more than 100 square feet of these paints, or coatings are expected to be impacted by a "trigger task" (demolition), prior notification to Cal/OSHA will be required.

Other paints or applied coatings to include: the light green coating on the exterior metal wall panels, and the varnish on the wood wall paneling in the office were determined to contain lead in amounts less than 5,000 ppm and are classified as lead containing paint (LCP). Any work designated by California Occupational Safety Health Administration (Cal/OSHA) as a "trigger task" which will impact these paints, coatings, or materials must be done by properly trained personnel, in compliance with all lead related Cal/OSHA regulations and requirements.

Other Hazardous Materials

Entek did not specifically inspect for mercury containing fluorescent light tubes or light ballast which may contain polychlorinated biphenyls (PCBs), thermostats which may contain mercury switches, equipment or systems which may contain Freon or other fluorocarbons, or smoke detectors which may contain a radioactive element. However, information pertaining to these materials is included in this report for your use and reference, since these light systems are present on the project.

Introduction

This report presents results of an asbestos and lead survey performed by Entek which included all interior and exterior designated areas included in an upcoming demolition project. Those areas include: exterior ground finishes such as concrete and painted asphalt, the main building (which includes the lookout tower), the small pump house building located on the north side of the main building, the storage unit located east of the main building and the storage unit located south of the main building. These buildings are located at the Vina Helitack Base, 4520 Highway 99E, Vina, California. Fluorescent lights were observed at this project site; therefore, this report also includes references to regulations pertaining to handling practices and waste disposal of PCB light ballasts and mercury containing light tubes and thermostats which may be impacted during this project.

I conducted this survey on January 15 & 16, 2014. I am a US EPA Asbestos Hazard Emergency Response Act (AHERA)-accredited building inspector, a Cal/OSHA Certified Asbestos Consultant (CAC) and a State of California Department of Public Health (CDPH) certified Lead Inspector/Assessor.

Building Descriptions

Main Building

This is a wood framed, slab-on-grade building with modern extruded aluminum windows and is finished throughout with metal wall and roof panels on the exterior. It is generally a one story building with a two story garage and second story lookout tower. A mezzanine storage area is located in the garage. The single story portion of the building houses a reception area, television room, general public restroom, office, kitchen, dining area, and two separate barracks which house restrooms and shower rooms as well as sleeping quarters. Interior finishes include drywall walls and ceilings with four different styles of applied texture, 9" vinyl floor tile, 12" vinyl floor tile, various styles of sheet vinyl flooring, and three different types of cove base with adhesives. The attic space in the single story portion is insulated with two different types of blown-in insulation and the attic above the garage is not insulated. Piping within the attic space was observed to be insulated with fiberglass. Air conditioning is provided by a combination of two HVAC units and what appears to be a whole-house fan unit. Interior finishes in the lookout tower includes 9" vinyl floor tile, painted plywood walls and ceiling with large windows on all four sides. Exterior finishes associated with the lookout tower are the same as the remainder of the building.

Small Pump House Building (North of Main Building)

This is a one story, wood framed, slab-on-grade structure which houses pump switches, etc. The exterior is finished with metal roof and wall panels. There are no interior finishes.

Storage Unit (East of Main Building)

This is a one story, wood framed, slab-on-grade structure with a covered portico on the east side. There is an overhead door located on the south side of the building. The exterior is finished with metal roof and wall panels. There are no interior finishes.

Storage Unit (South of Main Building)

This is a small, one story, wood framed, slab-on-grade structure, and is adjacent to the concrete gasoline storage vessel. The exterior is finished with metal roof and wall panels. There are no interior finishes.

Asbestos Inspection and Sample Collection Protocols

Entek included all designated interior and exterior areas of the buildings included in this report.

Entek did not use any demolition methods to look within enclosed wall or ceiling cavities during this investigation. Entek did include all suspect materials observed in, on, or associated with the areas included in this report.

Bulk samples were collected of various materials suspected to contain asbestos by utilizing a power drill and coring tube, cutting the materials with a razor knife, or use of other appropriate hand tools.

Surfacing materials were collected in a statistically random manner representative of the associated homogenous area as required in 40 CFR Part 763, Asbestos-Containing Materials in Schools; Final Rule and Notice, published October 30, 1987.

Miscellaneous materials were collected from each homogenous area in a manner sufficient to determine whether the material is or is not ACM as required in 40 CFR Part 763, Asbestos-Containing Materials in Schools; Final Rule and Notice, published October 30, 1987.

Approximate locations of all samples collected during this inspection are indicated on the "Bulk Asbestos Material Analysis Request Form for Entek", which served as the chain of custody for the samples, and on the building diagrams attached to this report.

Asbestos Bulk Sample Results

There were several materials observed which are considered "suspect" under US EPA guidelines. Under current US EPA guidelines for conducting building inspections for ACM, all "suspect" materials must be assumed to contain asbestos until otherwise determined by laboratory testing.

The samples of materials suspected of containing asbestos were submitted to Asbestech, a laboratory located in Carmichael, California. These samples were subsequently analyzed by polarized light microscopy (PLM) with dispersion staining.

US EPA NESHAP uses the terms RACM, CAT-I, & CAT-II when identifying materials which contain asbestos in amounts greater than 1%. Cal/OSHA uses the term ACCM which indicates a manufactured construction material contains greater than 0.1% asbestos by weight by the PLM method. This definition can be found in Title 8, 1529.

All samples found to contain <1% asbestos by PLM analysis which are not identified as containing >1% asbestos, classified as RACM, CAT-I, or CAT-II materials in the following results tables were additionally analyzed using the 400 point count (PC) method with analysis by PLM. This additional analysis is required by NESHAP and enforced by CARB. The PC method analysis results were used only to verify a material did not contain >1% asbestos as a single layer material, or as a composite result which is provided for materials such as sheetrock/drywall and joint compound used for wall/ceiling systems. A result reported as none detected or "trace" by the PC method only verified the initial PLM result of <1% and shall not be used to determine the identified material does not contain asbestos. Copies of Asbestech's laboratory reports and accreditations are attached.

Neither OSHA or Cal/OSHA allow for composite sampling of wall system materials, and neither address the use of the PC method to confirm a material identified as containing <1% asbestos by the PLM method either contains <1% asbestos or is non-detected for asbestos. As a result, reporting of the asbestos content related to a composited material such as

sheetrock/drywall and joint compound does not apply to determining if a material is or is not an ACM by OSHA or an ACCM by Cal/OSHA.

A total of 69 bulk samples were collected of all the materials considered to be "suspect", and which were observed during this investigation. Some of those samples contained multiple layers which were individually analyzed to determine their asbestos content. Analysis of all samples collected was by PLM with dispersion staining. Results of the analysis are listed in the following tables:

Suspect Materials Found or Known TO Contain >1% Asbestos (RACM)				
Sample ID#'s	**Suspect Material**	**Asbestos Content/Type**	**Location**	**Total Estimated Quantity**
ECG-14-2959-12A	Sheet Vinyl Flooring (Gray Mosaic)	15-20% CHRYSOTILE	Barracks 1, Barracks 1 Laundry & Barracks 1 Restroom	1,200 Sq. Ft.

Suspect Materials Found or Known TO Contain >1% Asbestos (CAT-I)				
Sample ID#'s	**Suspect Material**	**Asbestos Content/Type**	**Location**	**Total Estimated Quantity**
ECG-14-2959-14A	9" Vinyl Floor Tile (Beige)	1-5% CHRYSOTILE (Floor Tile) NONE DETECTED (Black Mastic)	TV Room (Beneath Carpet and Existing Sheet Vinyl Flooring) and Adjacent Closet	450 Sq. Ft.
ECG-14-2959-15A	9" Vinyl Floor Tile (Green)	2-7% CHRYSOTILE (Floor Tile) NONE DETECTED (Black Mastic)	Garage Mezzanine Storage	200 Sq. Ft.
ECG-14-2959-16A	9" Vinyl Floor Tile (Gray With Brown Streaks)	1-2% CHRYSOTILE (Floor Tile) NONE DETECTED (Black Mastic)	Lookout Tower	200 Sq. Ft.
ECG-14-2959-17A	12" Vinyl Floor Tile (Cream With Orangish Streaks)	1-5% CHRYSOTILE (Floor Tile) NONE DETECTED (Yellow & Black Mastic)	Reception	150 Sq. Ft.
ECG-14-2959-21A & 22A	Roof Penetration Mastic	1-5% CHRYSOTILE (Mastic) NONE DETECTED (Silver Paint)	Various Roof Locations	30 Sq. Ft.

NOTE: Any CAT-I or CAT-II materials identified in the previous tables which will be subjected to mechanical removal, must be considered RACM for the purposes of

notification to CARB and classification of waste. Removal of any CAT-I or CAT-II materials prior to demolition of a building is dependent upon how the materials will be impacted and if the impact will cause the materials to become friable. If any remaining CAT-I or CAT-II materials will become friable they must be removed prior to the initiation of demolition.

Suspect Materials Found or Known TO Contain <1% Asbestos (ACCM)				
Sample ID#'s	**Suspect Material**	**Asbestos Content/Type**	**Location**	**Total Estimated Quantity (Sq./Ln./Cu. Ft.)**
ECG-14-2959-01E,27A, & 28A	Drywall & Joint Compound	1-2% CHRYSOTILE (Joint Compound) NONE DETECTED (Drywall) <1% Composite (Confirmed by Point Count)	Reception & TV Room	1,550 Sq. Ft.

NOTE: Cal/OSHA regulates all materials containing greater than 0.1% asbestos. As a result, impact to materials identified as ACCM and ACM must be performed by properly asbestos trained personnel utilizing appropriate personal protection, work practices, as well as, properly constructed and demarcated work areas or containments, in accordance with Cal/OSHA asbestos regulations.

Suspect Materials Found NOT TO Contain Asbestos or Considered Non-Suspect				
Sample ID#'s	**Suspect Material**	**EPA AHERA "Suspected" ACBM**	**Asbestos Content**	**Location**
ECG-14-2959-01A-D, 01F-J,29A, 30A, 31A, 32A,33A & 34A	Drywall & Joint Compound	Miscellaneous	NONE DETECTED	Throughout (Except Reception & TV Room)
ECG-14-2959-02A-G	Drywall Texture #1 (Knockdown Style)	Surfacing	NONE DETECTED	Dining, TV Room, Office, Barracks 1 Shower, Barracks 2 Corridor, Barracks 2 Restroom/ Showers & Barracks 2
ECG-14-2959-03AC	Drywall Texture #2 (Splatter Style)	Surfacing	NONE DETECTED	Main Corridor
ECG-14-2959-04A-E	Drywall Texture #3 (Skip Trowel Style)	Surfacing	NONE DETECTED	Reception, Barracks 1 & Barracks 1 Restroom
ECG-14-2959-05A	Cove Base (Black) With Yellow Adhesive	Miscellaneous	NONE DETECTED	Dining

Suspect Materials Found NOT TO Contain Asbestos or Considered Non-Suspect				
Sample ID#'s	**Suspect Material**	**EPA AHERA "Suspected" ACBM**	**Asbestos Content**	**Location**
ECG-14-2959-06A	Cove Base (Gray) With White and Brown Adhesive	Miscellaneous	NONE DETECTED	Kitchen
ECG-14-2959-07A	Cove Base (Brown) With Brown Adhesive	Miscellaneous	NONE DETECTED	Pantry, Main Corridor, Barracks 1 Restroom & Laundry
ECG-14-2959-08A-B	Sheet Vinyl Flooring (Gray With White Specks) & Yellow Mastic	Miscellaneous	NONE DETECTED	Dining, Kitchen, Restroom 1, TV Room & Barracks 2 Restroom/ Shower
ECG-14-2959-09A	Sheet Vinyl Flooring (Brown Mosaic) & Yellow Mastic	Miscellaneous	NONE DETECTED	Pantry
ECG-14-2959-10A-B	Sheet Vinyl Flooring (Tan With White Specks) & Yellow Mastic	Miscellaneous	NONE DETECTED	Main Corridor & Restroom 1
ECG-14-2959-11A & 35A ** (See Note Below)	Sheet Vinyl Flooring (Pink & Gray Mosaic) & Yellow Mastic	Miscellaneous	NONE DETECTED	Barracks 1 Shower
ECG-14-2959-13A	Sheet Vinyl Flooring (Tan Mosaic) & Yellow Mastic With Leveling Compound	Miscellaneous	NONE DETECTED	Barracks 2 Corridor
ECG-14-2959-18A-B	Carpet Adhesive (Light Brown) & Gray Leveling Compound	Miscellaneous	NONE DETECTED	TV Room, Office & Barracks 2
ECG-14-2959-19A-B	Brick Mortar	NOT CLASSIFIED	NONE DETECTED	Various Planting Beds & Fence Pylasters
ECG-14-2959-20A-C	Concrete	NOT CLASSIFIED	NONE DETECTED	Various Pads & Building Foundations
ECG-14-2959-23A	Elastomeric Style Roof Penetration Sealant	NOT CLASSIFIED	NONE DETECTED	Various Roof Penetrations

Suspect Materials Found NOT TO Contain Asbestos or Considered Non-Suspect				
Sample ID#'s	**Suspect Material**	**EPA AHERA "Suspected" ACBM**	**Asbestos Content**	**Location**
ECG-14-2959-24A-G	Blown-in Attic Insulation (White)	Miscellaneous	NONE DETECTED	Throughout Main Building Attic
ECG-14-2959-25A-G	Blown-in Attic Insulation (Brown)	Miscellaneous	NONE DETECTED	Throughout Main Building Attic
ECG-14-2959-26A-C	Drywall Texture (Sponge Applied Style)	Surfacing	NONE DETECTED	Kitchen

** A confirmatory sample (ECG-14-2959-35A) of this material was collected on January 23, 2014. The original description was pink and gray mosaic sheet vinyl flooring.

US EPA AHERA uses three terms when determining the classification of a material for the purpose of sampling. These terms include miscellaneous, surfacing, and thermal system insulation (TSI).

Miscellaneous materials are building materials on structural components, structural members or fixtures, such as floor and ceiling tiles, and does not include surfacing material or TSI.

Surfacing materials are materials that are sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceiling and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

TSI is material applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain, water condensation, or for other purposes.

The information provided in the tables of this report are for use by the Owner in determining where asbestos containing materials are located, and whether or not any future work may impact those materials. The information is also provided for use by any contractor who may perform work in areas impacting the materials listed in this report, and for use as appropriate by asbestos abatement contractors to provide costs related to work impacting ACM.

Any building materials which are considered "suspect" for containing asbestos which have not been identified in this report must be assumed to contain asbestos in amounts >1% until properly investigated and/or tested.

Materials commonly excluded from being suspected for containing asbestos include, but are not limited to: unwrapped pink and yellow fiberglass insulating materials or products, foam insulation, bare concrete, wood, metal, plastic, or glass. All other types of building materials or coatings on the materials listed above are commonly listed as "suspect" and must be tested prior to impact by a Contractor. Work impacting these untested or newly

discovered materials must cease until an investigation can be completed.

Asbestos Regulatory Requirements

US EPA

The property included in this survey report is located in Tehama County. In conjunction with EPA Region 9, the California Air Resources Board (CARB) has been given authority for enforcement of the NESHAP regulations.

A demolition is the wrecking, taking out, or burning of any load supporting structural member. A renovation is everything else. 10 day written notification to the CARB are required prior to the performance of any demolition project regardless of asbestos being present or not. This notification would also apply to any renovation project which involves the wrecking, taking out, or burning of any load bearing structural member during a renovation as well.

There is a sufficient amount of ACM present to require a 10 day notification to EPA Region 9 and CARB be submitted prior to starting work which will impact materials identified as RACM, or CAT-I and CAT-II materials if they are made friable. More than 160 square feet of vinyl sheet flooring (RACM) will be removed prior to building demolition. As a result, formal written notification to EPA Region 9 and CARB are required.

Cal/OSHA

Disturbance of any ACM or ACCM could generate airborne asbestos fibers and would be regulated by Cal/OSHA. Cal/OSHA worker health and safety regulations apply during any disturbance of ACM or ACCM by a person while in the employ of another. This is true regardless of friability or quantity disturbed. Since it has been estimated more than 100 square feet of ACM does exist and will be impacted during the upcoming project, a licensed asbestos contractor, certified by the State of California, and registered with Cal/OSHA is required to perform the asbestos related removal work. Entek recommends a licensed asbestos contractor be used to remove ACCM even if less than 100 square feet of ACCM is being disturbed.

For compliance with Title 8, Section 341.9, the asbestos contractor must send written notice at least one day (24 hours) prior to start of any work which will impact any amount of asbestos to the local office for the State of California, Department of Occupational Safety and Health, and perform all work in accordance with Cal/OSHA requirements.

Lead Inspection and Sampling

An X-ray fluorescence (XRF) Spectrum Analyzer was used during the lead inspection portion of this survey as a screening tool in determining if lead is present in quantities which would require existing paints and/or coatings to be classified as LBP.

In XRF spectroscopy, the process begins by exposing the sample in question to a source of x-rays or gamma rays. As these high energy photons strike the sample, they tend to

knock electrons out of their orbits around the nuclei of the atoms that make up the sample. When this occurs, an electron from an outer orbit, or "shell", of the atom will fall into the shell of the missing electron. Since outer shell electrons are more energetic than inner shell electrons, the relocated electron has an excess of energy that is expended as an XRF photon. This fluorescence is unique to the composition of the sample. The detector collects this spectrum and converts them to electrical impulses that are proportional to the energies of the various x-rays in the sample's spectrum. Since each element has a different and identifiable x-ray signature, we can look at specific parts of the emitted spectrum, and by counting the pulses in the sector, determine the presence and concentration of the element(s) in question within the sample. Entek uses a Niton XRF spectrum analyzer which is specific to measuring only lead in the building substrate.

Lead Sampling Results

XRF Spectrum Analyzer testing indicated lead was present in concentrations >1.0 mg/cm^2 on various building components. These building components and colors of paints included tan exterior trim paint on the entry door and support column at the reception entry, the dark green exterior trim paint on the door frame at the reception entry, exterior yellow striping paint on the concrete kitchen patio and north entry to barracks 2, the tan paint on the interior door frame in the lookout tower, the interior tan paint on the west wood wall in the garage, the white paint on the wood ceiling in the garage, the stair stringer to the mezzanine storage in the garage, the white paint on the window sill in restroom #1, the varnish on the wood window sill in the pantry, the yellow paint on the protective bollard surrounding the propane tank, and the dark green paint on the concrete peer which supports the wood columns at the storage unit located south of the main building. These paints/coatings are classified as LBP. All XRF sampling data are presented on the attached "Lead Testing Data Sheets (OSHA)" in the Appendix at the back of the report.

XRF direct reading technology is not capable of determining lead concentrations below 1.0 mg/cm^2. The limit of detection for this device with a 95% confidence level is 1.0 mg/cm^2. As a result, any reading provided by the XRF technology does not provide adequate information to determine the actual content of lead in the paint/coating being tested. Any XRF reading less than 1.0 mg/cm^2 (including readings of 0.00) only indicate lead is not present at levels high enough to classify the paint/coating as LBP. Therefore, any building component, paint, or coating not specifically analyzed by atomic absorption spectrometry (AAS) for lead content must be considered to contain some amount of lead and lead related work practices will apply if they are to be impacted.

Twenty (20) bulk samples of the painted surfaces from door frames, exterior siding, wood support posts and metal doors, interior walls, varnish associated with the wood wall paneling, cabinetry in the pantry, wood partitions in the barracks, stairs and interior walls at the lookout tower, door frame at the storage unit located east of the main building, and the concrete gasoline vessel were collected and submitted to Asbestech laboratory. These samples were subsequently analyzed by atomic absorption spectrometry (AAS). Results of the analysis are listed in the following tables:

Paints/Coatings/ Materials Determined to be Lead Based Paint (LBP)	
Paint/Coating Color	**Component/Location**
Tan	Interior & Exterior Painted Wood and Metal Components
Yellow	Exterior Striping Paint on Concrete and Asphalt and Protective Metal Bollards at Propane Tank
White	Interior Wood Walls & Ceilings
Varnish	Interior Wood Window Sills
Dark Green	Metal Stairs at Lookout Tower, Concrete Support Beneath Wood Column at Storage Unit Located South of the Main Building
Blue-Green	Exterior Wood Components

LBP - Materials/coatings/paints meeting the definition of lead-based paint as defined by the CDPH and the US EPA, currently defined as containing lead in concentrations equal to or greater than 1.0 mg/cm^2, 5,000 ppm, or 0.5% by weight.

Paints/Coatings/ Materials Determined to be Lead Containing Paint (LCP)		
Paint/Coating Color	**Lead Content**	**Component/Location**
Light Green	53 ppm	Exterior Siding
Tan	210 ppm	Stair Hand Rail at Lookout Tower
Tan	980 ppm	Interior Plywood Walls in Lookout Tower
Varnish	300 ppm	Interior Wood Paneling in Office

LCP - Materials/coatings/paints which contain measurable amounts of lead. The disturbance of these materials/coatings/paints is regulated by Cal/OSHA.

Paints/Coatings/Materials Determined NOT TO Contain Lead	
Paint/Coating Color	**Building Component**
Dark Green	Throughout Exterior Except Stairs at Lookout Tower and Concrete Support at Storage Unit (South of Main Bldg.)
Brown	Interior Walls
White	Interior Wood Cabinetry
Varnish	Interior Wood Partitions in Barracks 1 Bunk Area
Cream	Interior Walls in Barracks 2
White	Interior Wall in Barracks 2
Light Brown	Interior Wood Trim in Barracks 2

Paints determined "NOT TO" contain lead for the purposes of this report are those samples which when analyzed did not indicate lead to be present at or above the limit of detection for the analysis method used. This limit of detection was 50 parts per million (ppm). As a result, any paints shown "NOT TO" contain lead will not require any special training or work practices related to lead when impacted.

Lead Regulatory Compliance

Any upcoming project which may result in the disturbance of lead containing products or surfaces, but is not intended to remediate a lead hazard or specifically designed to remove LBP to reduce or eliminate a known hazard, would be considered "lead related construction work".

Lead related construction work does not fit the classification of a "lead abatement project" under CDPH Title 17 regulations. "*Abatement*" is defined in Title 17, Division 1, Chapter 8, Article 1 as "any set of measures designed to reduce or eliminate lead hazards or LBP for public and residential buildings, but does not include containment or cleaning." A *lead hazard* is defined in Title 17, Division 1, Chapter 8, Article 1 as "deteriorated LBP, lead contaminated dust, lead contaminated soil, disturbing LBP or presumed LBP without containment, or any other nuisance which may result in persistent and quantifiable lead exposure."

Lead related construction work means any "construction, alteration, painting, demolition, salvage, renovation, repair, or maintenance of any residential or public building, including preparation and cleanup, that, by using or disturbing lead-containing material or soil, may result in significant exposure of adults or children to lead". (Title 17, California Code of Regulations, Division 1, Chapter 8, Article 1).

Currently, Cal/OSHA has not established a definition for LBP, nor have they established minimum concentrations where their regulations do not apply. Cal/OSHA regulates all construction activities involving materials containing lead, including LBP. These regulations are found in CCR, Title 8 Section 1532.1 (§1532.1) Lead in Construction.

Since Cal/OSHA has not established a concentration of lead in a product where their regulations do not apply, any disturbance to products containing lead come under the jurisdiction of Cal/OSHA and their regulations. Disturbance of paints/coatings or materials determined to be LBP may trigger a pre-work notification to Cal/OSHA if "trigger tasks" disturb 100 square feet or more of those paints/coatings or materials. Trigger tasks are described in Title 8 CCR 1532.1.

Fluorescent Light Tubes and Polychlorinated Biphenyls (PCBs)

Fluorescent light tubes which contain mercury are considered a universal waste and must be packaged and recycled appropriately if they are removed from a building and not used again. The regulation, called the Universal Waste Rule, are in the California Code of Regulations (CCR), Title 22, Division 4.5, Chapter 23.

Fluorescent light tubes are the bulb or tube portion of an electric lighting device and are commonly referred to as “lamps”. Examples of other common electric lamps considered to be universal wastes include, but are not limited to, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps. Any lamp which is not spent and has been designated to be reused is not classified as a waste and does not meet the requirements of a hazardous waste or a universal waste.

Spent lamps typically contain concentrations of mercury exceeding the established Total Threshold Limit Concentration (TTLC) and/or the Soluble Threshold Limit Concentration (STLC) values. Therefore, these lamps must be sent to an authorized recycle facility or to a universal waste consolidator for shipment to an authorized recycling facility.

At a minimum, if removed lamps will not be reused they must be packaged in boxes/ packages/containers which are structurally sound, adequate to prevent breakage, and compatible with the content of the lamps. These packages must remain closed and be free of damage which could cause leakage under reasonably foreseeable conditions. Each container must be labeled or marked clearly with one of the following phrases: “Universal Waste Lamp(s),” or “Waste Lamp(s),” or “Used Lamp(s).” Entek recommends shipping any lamp not designated for reuse to a universal waste recycling facility once they have been packaged.

PCB containing light ballasts are to be considered a hazardous waste, and must be properly manifested for transport to a hazardous waste facility. Any contractor who may perform PCB related work (inspection, removal, clean-up) must be trained and qualified to do so. All workers must also follow current OSHA regulations including 29 CFR 1910.120 and 8 CCR 5192, as well as, other applicable federal, state, and local laws, and regulations. While light ballasts marked “No PCB” are not considered a hazardous waste, they are considered a universal waste. As a result, removal, packaging, and disposal/recycling of these types of ballasts must be conducted in accordance with current regulations of Title 22.

Thermostats With Mercury Switches

It is possible existing thermostats may utilize switches containing mercury. The mercury in these switches would be considered a hazardous waste if removed and disposed. Any work requiring removal of thermostats containing mercury switches, must include having the switches inspected for the presence of mercury, and subsequently following all requirements for packaging and disposal of any switch found to contain mercury.

Freon and Fluorocarbons

Freon and other fluorocarbon products associated with HVAC systems, refrigerators, etc. may be present in or on the exterior of the buildings included in this investigation. Prior to demolition of a structure or removal of existing HVAC systems, refrigerators, or any other type of equipment which typically uses these types of coolant products shall have the coolant materials investigated prior to their demolition and removed from the mechanical systems and recycled in accordance with Cal/EPA requirements.

Smoke Detectors Which May Contain a Radioactive Element

It is possible existing smoke detectors may contain a radioactive element. These types of detectors are easily identified by reviewing the label which is usually found on the back of the detector. Older units may display the international radiation symbol (three bladed propeller) and the radioactive content. Newer units state the radioactive content and their Nuclear Regulatory Agency (NRC) license number.

Any work requiring the removal of smoke detectors with a radioactive element must include contacting the manufacturer of the smoke detector to determine their return policies. The California Department of Toxic Substance Control (DTSC) has stated that it is a condition of the manufacturers NRC license they must accept returned units for disposal.

Limitations

Entek inspected only the specific designated areas identified by the Owner of the buildings to be included in the upcoming demolition project, which did not include all buildings on the project site. The buildings included in our survey included the main building, the small pump house building located north of the main building, and the storage units located on the east and south sides of the main building and the gasoline storage vessel. Not included in our survey were the helicopter hangar and the helicopter fuel storage tank. As a result the information provided in this inspection report may not be used to extend the inspection results to areas not included in this report without additional review and sampling as necessary.

Sample results of the drywall and joint compound in the reception area and television room are consistent with the original construction dates of the main building as the joint compound was determined to contain asbestos. The drywall in all other areas of the main building are consistent with renovated areas and later construction periods and were determined not to contain asbestos in either the drywall or joint compound.

Entek did not perform any destructive sampling to look into ceiling and wall cavities. As a result, it may be possible for materials to be hidden in these areas which are not included in this report. Entek also did not employ any destructive measures on floors of interior spaces or exterior areas covered with asphalt, concrete, or dirt.

If any new materials not listed as having been sampled, or listed as assumed for containing asbestos in this report are discovered, the new material must be assumed to contain asbestos until properly inspected and tested for asbestos content.

Entek's policy is to retain a full copy of these written documents for three (3) years once the file is closed and final billed. At the end of the three (3) year period the written files will be destroyed without further notice. It is suggested copies of the file(s) are maintained as per the Owner's policy.

In an effort to help our environment, Entek has adopted a “green” policy and will be providing only this electronic copy of the report and its attachments for your use. However, if you would like a hard copy of this report please do not hesitate to ask. Entek will be happy to mail the report upon request.

Thank you for choosing Entek for your environmental needs. Please call me at (916) 632-6800 if you have any questions regarding this report.

Prepared by: _____

Jack DeLay
Project Manager
Cal/OSHA CAC #98-2419
CDPH I/A/M Certification #6725

Appendices

A. Asbestos Related Documents
B. Lead Related Documents
C. Backup Documentation

Z:\Clients\Nichols, Melburg & Rossetto\14-2959 Vina Helitack Base - Asb, PB, & Specs\Project Letters & Reports\Final Haz Mat Insp Rprt 01-29-14.wpd

APPENDIX A

ASBESTOS RELATED DOCUMENTS

- Bulk Asbestos Analysis Reports From Asbestech
- Bulk Asbestos Material Analysis Request Forms for Entek
- Asbestos Bulk Sample Location Drawing

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60206
Date/Time Collected: 1/15 & 16/14
Date Received: 1/17/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/22/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-01E	White drywall/ joint compound composite, main bldg. reception at SW corner	TRACE CHRYSOTILE	Gypsum Fibrous Glass Calcite

NOTE: This sample was analyzed by quantitative Point Counting using a Chalkley Point Array over 400 non-empty points.

THE ANALYSIS USES POLARIZED LIGHT MICROSCOPY AND DISPERSION STAINING FOLLOWING E.P.A. METHOD 600/R-93/116. NON-FRIABLE MATERIALS WERE ANALYZED APPLYING THE SAME METHOD. THE LOWER DETECTION LIMIT IS <1 % WITH THE PROVISO THAT PLM MAY NOT DETECT FIBERS <0.25 MICRONS IN DIAMETER THAT MAY BE PRESENT IN SAMPLES SUCH AS FLOOR TILES. IN ACCORDANCE WITH TITLE 22, CCR, SECTION 66261.24(a)(2)(A),THE MCL IS 1 %. SAMPLES WERE NOT COLLECTED BY ASBESTECH. THIS REPORT MUST NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE APPROVAL OF ASBESTECH. THIS REPORT RELATES ONLY TO THE ITEMS TESTED. THIS REPORT MUST NOT BE USED TO CLAIM PRODUCT ENDORSEMENT BY N.V.L.A.P. OR ANY AGENCY OF THE U.S. GOVERNMENT. ASBESTECH ACCEPTS TECHNICAL RESPONSIBILITY FOR THIS REPORT AND DATE OF ISSUE.

NVLAP LAB CODE 101442-0 LAB DIRECTOR: TOM CONLON ANALYST: JIM JUNGLES

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60212
Date/Time Collected: 1/23/14
Date Received: 1/23/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/24/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-27A	White drywall/ joint compound composite, main bldg. reception at east side at wall/ ceiling intersection	<1 CHRYSOTILE	Gypsum Fibrous Glass Calcite
28A	White drywall/ joint compound composite, main bldg. TV room south end of east wall at wall/ ceiling intersection	TRACE CHRYSOTILE	Gypsum Fibrous Glass Calcite

NOTE: These samples were analyzed by quantitative Point Counting using a Chalkley Point Array over 400 non-empty points.

THE ANALYSIS USES POLARIZED LIGHT MICROSCOPY AND DISPERSION STAINING FOLLOWING E.P.A. METHOD 600/R-93/116. NON-FRIABLE MATERIALS WERE ANALYZED APPLYING THE SAME METHOD. THE LOWER DETECTION LIMIT IS <1 % WITH THE PROVISO THAT PLM MAY NOT DETECT FIBERS <0.25 MICRONS IN DIAMETER THAT MAY BE PRESENT IN SAMPLES SUCH AS FLOOR TILES. IN ACCORDANCE WITH TITLE 22, CCR, SECTION 66261.24(a)(2)(A),THE MCL IS 1 %. SAMPLES WERE NOT COLLECTED BY ASBESTECH. THIS REPORT MUST NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE APPROVAL OF ASBESTECH. THIS REPORT RELATES ONLY TO THE ITEMS TESTED. THIS REPORT MUST NOT BE USED TO CLAIM PRODUCT ENDORSEMENT BY N.V.L.A.P. OR ANY AGENCY OF THE U.S. GOVERNMENT. ASBESTECH ACCEPTS TECHNICAL RESPONSIBILITY FOR THIS REPORT AND DATE OF ISSUE.

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60196-1
Date/Time Collected: 1/15 & 16/14
Date Received: 1/17/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/20/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-01A	White drywall, main bldg. dining at NE corner	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	NONE DETECTED	Granular Mins.
	White joint compound 2	NONE DETECTED	Calcite
01B	White drywall, main bldg. kitchen at SW corner	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	NONE DETECTED	Calcite
	White joint compound 2	NONE DETECTED	Calcite
01C	White drywall, main bldg. pantry at NW corner	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	NONE DETECTED	Calcite
	White joint compound 2	NONE DETECTED	Calcite
01D	White drywall, main bldg. TV room at NW corner	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	NONE DETECTED	Calcite
	White joint compound 2	NONE DETECTED	Calcite

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60196-2
Date/Time Collected: 1/15 & 16/14
Date Received: 1/17/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/20/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-01E	White drywall, main bldg. reception at SW corner	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound	<1 CHRYSOTILE	Calcite
	Composite	<1 CHRYSOTILE	Gypsum Fibrous Glass Calcite
01F	White drywall, main bldg. office at NW corner	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	NONE DETECTED	Granular Mins.
	White joint compound 2	NONE DETECTED	Calcite
01G	White drywall, main bldg. restroom at barracks 1 at NW corner	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	NONE DETECTED	Granular Mins.
	White joint compound 2	NONE DETECTED	Calcite
01H	White drywall, main bldg. laundry at NW corner	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	NONE DETECTED	Granular Mins.
	White joint compound 2	NONE DETECTED	Calcite

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60196-3
Date/Time Collected: 1/15 & 16/14
Date Received: 1/17/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/20/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-01I	White drywall, main bldg. barracks 1 at NW corner	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	NONE DETECTED	Granular Mins.
	White joint compound 2	NONE DETECTED	Granular Mins.
01J	White drywall, main bldg. barracks 2 at NE corner	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	NONE DETECTED	Granular Mins.
	White joint compound 2	NONE DETECTED	Granular Mins.
02A	White drywall texture #1 (knockdown style), main bldg. dining at south wall	NONE DETECTED	Calcite
02B	White drywall texture #1 (knockdown style), main bldg. TV room at west wall	NONE DETECTED	Calcite
02C	White drywall texture #1 (knockdown style), main bldg. office at west wall	NONE DETECTED	Calcite
02D	White drywall texture #1 (knockdown style), main bldg. restroom at barracks 1 at east wall	NONE DETECTED	Calcite

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60196-4
Date/Time Collected: 1/15 & 16/14
Date Received: 1/17/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/20/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-02E	White drywall texture #1 (knockdown style), main bldg. corridor at barracks 2 at east wall	NONE DETECTED	Granular Mins.
02F	White drywall texture #1 (knockdown style), main bldg. restroom at barracks 2 at east wall	NONE DETECTED	Granular Mins.
02G	White drywall texture #1 (knockdown style), main bldg. barracks 2 at north wall	NONE DETECTED	Granular Mins.
03A	White drywall texture #2 (splatter style), main bldg. kitchen at north wall	NONE DETECTED	Calcite
03B	White drywall texture #2 (splatter style), main bldg. kitchen at west wall	NONE DETECTED	Calcite
03C	White drywall texture #2 (splatter style), main bldg. main corridor at west wall	NONE DETECTED	Calcite
04A	White drywall texture #3 (skip trowel style), main bldg. reception at north wall	NONE DETECTED	Calcite
04B	White drywall texture #3 (skip trowel style), main bldg. reception at south wall	NONE DETECTED	Calcite

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60196-5
Date/Time Collected: 1/15 & 16/14
Date Received: 1/17/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/20/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-04C	White drywall texture #3 (skip trowel style), main bldg. restroom at barracks 1 at north wall	NONE DETECTED	Calcite
04D	White drywall texture #3 (skip trowel style), main bldg. barracks 1 at north wall	NONE DETECTED	Calcite
04E	White drywall texture #3 (skip trowel style), main bldg. barracks 1 at east wall	NONE DETECTED	Calcite
05A	Black cove base, main bldg. dining at east wall	NONE DETECTED	Calcite Opaques
	Yellow adhesive	NONE DETECTED	Synthetics
06A	Gray cove base, main bldg. kitchen at north wall	NONE DETECTED	Calcite Opaques
	White adhesive	NONE DETECTED	Calcite
	Brown adhesive	NONE DETECTED	Cellulose
07A	Brown cove base, main bldg. pantry at north wall	NONE DETECTED	Calcite Opaques
	Brown adhesive	NONE DETECTED	Synthetics Wollastonite

THE ANALYSIS USES POLARIZED LIGHT MICROSCOPY AND DISPERSION STAINING FOLLOWING E.P.A. METHOD 600/R-93/116. NON-FRIABLE MATERIALS WERE ANALYZED APPLYING THE SAME METHOD. THE LOWER DETECTION LIMIT IS <1 % WITH THE PROVISO THAT PLM MAY NOT DETECT FIBERS <0.25 MICRONS IN DIAMETER THAT MAY BE PRESENT IN SAMPLES SUCH AS FLOOR TILES. IN ACCORDANCE WITH TITLE 22, CCR, SECTION 66261.24(a)(2)(A),THE MCL IS 1 %. SAMPLES WERE NOT COLLECTED BY ASBESTECH. THIS REPORT MUST NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE APPROVAL OF ASBESTECH. THIS REPORT RELATES ONLY TO THE ITEMS TESTED. THIS REPORT MUST NOT BE USED TO CLAIM PRODUCT ENDORSEMENT BY N.V.L.A.P. OR ANY AGENCY OF THE U.S. GOVERNMENT. ASBESTECH ACCEPTS TECHNICAL RESPONSIBILITY FOR THIS REPORT AND DATE OF ISSUE.

NVLAP LAB CODE 101442-0 LAB DIRECTOR: TOM CONLON ANALYST: JIM JUNGLES

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60196-6
Date/Time Collected: 1/15 & 16/14
Date Received: 1/17/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/20/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-08A	Gray w/ white specks sheet vinyl flooring, main bldg. doorway at main corridor/ dining intersection	NONE DETECTED	Vinyl Cellulose
	Yellow mastic	NONE DETECTED	Synthetics
08B	Gray w/ white specks sheet vinyl flooring, main bldg. restroom at barracks 2 at west side of entry	NONE DETECTED	Vinyl Cellulose
	Yellow mastic	NONE DETECTED	Synthetics
	White leveler	NONE DETECTED	Gypsum
09A	Brown mosaic sheet vinyl flooring, main bldg. pantry at east side of entry	NONE DETECTED	Vinyl Cellulose
	Yellow mastic	NONE DETECTED	Synthetics
10A	Tan w/ white specks sheet vinyl flooring, main bldg. doorway at main corridor/ dining intersection	NONE DETECTED	Vinyl Cellulose
	Yellow mastic	NONE DETECTED	Synthetics

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60196-7
Date/Time Collected: 1/15 & 16/14
Date Received: 1/17/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/20/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-10B	Tan w/ white specks sheet vinyl flooring, main bldg. restroom 1 at north side of entry doorway	NONE DETECTED	Vinyl Cellulose
	Yellow mastic	NONE DETECTED	Synthetics
	Gray leveler	NONE DETECTED	Calcite
11A	Pink & gray mosaic sheet vinyl flooring, main bldg. entry to shower at barracks 1	NONE DETECTED	Vinyl Cellulose
	Yellow mastic	NONE DETECTED	Synthetics
12A	Gray mosaic sheet vinyl flooring, main bldg. corridor at laundry at west side of doorway entry	15-20 CHRYSOTILE	Vinyl Opaques
12B	NOT ANALYZED		
13A	Tan mosaic sheet vinyl flooring, main bldg. corridor at barracks 2 at doorway to barracks 1	NONE DETECTED	Vinyl Cellulose
	Yellow mastic	NONE DETECTED	Synthetics
	White leveler	NONE DETECTED	Gypsum

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60196-8
Date/Time Collected: 1/15 & 16/14
Date Received: 1/17/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/20/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-14A	Beige 9” vinyl floor tile, main bldg. closet in TV room	1-5 CHRYSOTILE	Granular Mins.
	Black mastic	NONE DETECTED	Tar Binder
15A	Green 9” vinyl floor tile, main bldg. garage mezzanine storage	2-7 CHRYSOTILE	Granular Mins.
	Black mastic	NONE DETECTED	Tar Binder
16A	Gray w/ brown streaks 9” vinyl floor tile, main bldg. lookout tower	1-2 CHRYSOTILE	Granular Mins. Opaques
	Black mastic	NONE DETECTED	Tar Binder
17A	Cream w/ orangish streaks 9” vinyl floor tile, main bldg. south reception entry (at garage) at west side of doorway	1-5 CHRYSOTILE	Granular Mins. Opaques
	Black/ yellow mastic	NONE DETECTED	Synthetics
17B	NOT ANALYZED		
18A	Light brown carpet adhesive, main bldg. NW corner of office	NONE DETECTED	Synthetics

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60196-9
Date/Time Collected: 1/15 & 16/14
Date Received: 1/17/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/20/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-18B	Light brown carpet adhesive, main bldg. barracks 2 at NE corner	NONE DETECTED	Synthetics
	Gray leveler	NONE DETECTED	Calcite
19A	Gray brick mortar, main bldg. planting beds at west side of bldg.	NONE DETECTED	Granular Mins.
	Red brick	NONE DETECTED	Granular Mins.
19B	Gray brick mortar, main bldg. fence pilaster located SW of main bldg.	NONE DETECTED	Granular Mins.
20A	Gray concrete, main bldg. pad at stairs to lookout tower	NONE DETECTED	Granular Mins.
20B	Gray concrete, main bldg. foundation at SE corner at barracks 2 restroom	NONE DETECTED	Granular Mins.
	Green paint	NONE DETECTED	Opaques
20C	Gray concrete, main bldg. curb at north side	NONE DETECTED	Granular Mins.
21A	Gray penetration mastic, main bldg. west side at kitchen plumbing vent	1-5 CHRYSOTILE	Tar Binder
	Silver paint	NONE DETECTED	Opaques

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60196-10
Date/Time Collected: 1/15 & 16/14
Date Received: 1/17/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/20/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-22A	Gray roof mastic, main bldg. west side at kitchen plumbing vent	1-5 CHRYSOTILE	Tar Binder
23A	Gray elastomeric style sealant, main bldg. roof penetration at west side	NONE DETECTED	Opaques Polyethylene
24A	White attic insulation, main bldg. south end	NONE DETECTED	Fibrous Glass
24B	White attic insulation, main bldg. middle of west side	NONE DETECTED	Fibrous Glass
24C	White attic insulation, main bldg. west side at dining access	NONE DETECTED	Fibrous Glass
	Brown insulation	NONE DETECTED	Cellulose
24D	White attic insulation, main bldg. west of laundry access	NONE DETECTED	Fibrous Glass
	Brown insulation	NONE DETECTED	Cellulose
24E	White attic insulation, main bldg. north of laundry access	NONE DETECTED	Fibrous Glass
24F	White attic insulation, main bldg. east of laundry access	NONE DETECTED	Fibrous Glass

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60196-11
Date/Time Collected: 1/15 & 16/14
Date Received: 1/17/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/20/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-24G	White attic insulation, main bldg. east end	NONE DETECTED	Fibrous Glass
25A	Brown attic insulation, main bldg. south end	NONE DETECTED	Cellulose
25B	Brown attic insulation, main bldg. middle of west side	NONE DETECTED	Cellulose
25C	Brown attic insulation, main bldg. west side at dining access	NONE DETECTED	Cellulose
25D	Brown attic insulation, main bldg. west of laundry access	NONE DETECTED	Cellulose
25E	Brown attic insulation, main bldg. north of laundry access	NONE DETECTED	Cellulose
25F	Brown attic insulation, main bldg. east of laundry access	NONE DETECTED	Cellulose
25G	Brown attic insulation, main bldg. east end	NONE DETECTED	Cellulose

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60196-12
Date/Time Collected: 1/15 & 16/14
Date Received: 1/17/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/20/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-26A	White sponge-applied drywall texture, main bldg. west wall of kitchen	NONE DETECTED	Calcite
26B	White sponge-applied drywall texture, main bldg. middle of ceiling	NONE DETECTED	Calcite
26C	White sponge-applied drywall texture, main bldg. north side of kitchen ceiling	NONE DETECTED	Calcite

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60209-1
Date/Time Collected: 1/23/14
Date Received: 1/23/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/24/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-27A	White drywall, main bldg. reception at east side at wall/ ceiling intersection	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	1-2 CHRYSOTILE	Calcite
	White joint compound 2	<1 CHRYSOTILE	Calcite
	Composite	<1 CHRYSOTILE	Gypsum Fibrous Glass Calcite
27B	NOT ANALYZED		
28A	White drywall, main bldg. TV room south end of east wall at wall/ ceiling intersection	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	1-2 CHRYSOTILE	Calcite
	White joint compound 2	<1 CHRYSOTILE	Calcite
	Composite	<1 CHRYSOTILE	Gypsum Fibrous Glass Calcite
28B	NOT ANALYZED		

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60209-2
Date/Time Collected: 1/23/14
Date Received: 1/23/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/24/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-29A	White drywall, main bldg. office middle of east wall at wall/ ceiling intersection	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	NONE DETECTED	Granular Mins.
	White joint compound 2	NONE DETECTED	Calcite
30A	White drywall, main bldg. restroom 1 north side above shower unit at wall/ ceiling intersection	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	NONE DETECTED	Granular Mins.
	White joint compound 2	NONE DETECTED	Granular Mins.
31A	White drywall, main bldg. pantry north side above doorway at wall/ ceiling intersection	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	NONE DETECTED	Calcite
	White joint compound 2	NONE DETECTED	Calcite
32A	White drywall, main bldg. kitchen north side above doorway leading to dining at wall/ ceiling intersection	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	NONE DETECTED	Granular Mins.
	White joint compound 2	NONE DETECTED	Granular Mins.

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BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 60209-3
Date/Time Collected: 1/23/14
Date Received: 1/23/14

NVLAP Lab Code 101442-0
DOHS # 1153
Date Analyzed: 1/24/14

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-14-2959-33A	White drywall, main bldg. dining east side above exit door at wall/ ceiling intersection	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	NONE DETECTED	Granular Mins.
	White joint compound 2	NONE DETECTED	Granular Mins.
34A	White drywall, main bldg. barracks 1 restroom north side above doorway at wall/ ceiling intersection	NONE DETECTED	Gypsum Fibrous Glass
	White joint compound 1	NONE DETECTED	Granular Mins.
	White joint compound 2	NONE DETECTED	Granular Mins.
35A	Tan mosaic sheet vinyl flooring, main bldg. barracks 1 shower at entry doorway	NONE DETECTED	Vinyl Cellulose
	Yellow mastic	NONE DETECTED	Synthetics

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BULK ASBESTOS MATERIAL *Analysis Request Form for* ***Entek Consulting Group, Inc.***

4200 ROCKLIN ROAD, STE. 7
ROCKLIN, CA 95677
(916) 632-6800
FAX (916) 632-6812

Date of Sampling: January 15 & 16, 2014

Lab: Asbestech

Job Number: 14-2959

Turnaround Time: Tuesday, January 21, 2014 at 5:00pm

Client Name: Nichols, Melburg & Rosetto

Collected by: Jack DeLay

Site Address: Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

ANALYSIS REQUESTED: Asbestos by PLM with Dispersion Staining

Special Instruction:
Stop Analysis upon first positive result (>1%) for sample in a series. Also stop analysis upon first positive result (>1%) in the joint compound for sample series.

Please e-mail results as soon as available and include copy of submittal with those results.

SAMPLE #	MATERIAL DESCRIPTION/LOCATION
ECG-14-2959-01A	Drywall and Joint Compound / Main Building, Dining at Northeast Corner
ECG-14-2959-01B	Drywall and Joint Compound / Main Building, Kitchen at Southwest Corner
ECG-14-2959-01C	Drywall and Joint Compound / Main Building, Pantry at Northwest Corner
ECG-14-2959-01D	Drywall and Joint Compound / Main Building, TV Room at Northwest Corner
ECG-14-2959-01E	Drywall and Joint Compound / Main Building, Reception at Southwest Corner
ECG-14-2959-01F	Drywall and Joint Compound / Main Building, Office at Northwest Corner
ECG-14-2959-01G	Drywall and Joint Compound / Main Building, Restroom at Barracks 1 at Northwest Corner
ECG-14-2959-01H	Drywall and Joint Compound / Main Building, Laundry at Northwest Corner

Delivered by: J. DeLay **Date:** 1/17/14 **Time:** 0745 hrs.

Received by: [illegible] **Date:** 1/17/14 **Time:** 830

601 96

ENTEK

BULK ASBESTOS MATERIAL *Analysis Request Form for* ***Entek Consulting Group, Inc.***

4200 ROCKLIN ROAD, STE. 7
ROCKLIN, CA 95677
(916) 632-6800
FAX (916) 632-6812

Date of Sampling: January 15 & 16, 2014

Lab: Asbestech

Job Number: 14-2959

Turnaround Time: Tuesday, January 21, 2014 at 5:00pm

Client Name: Nichols, Melburg & Rosetto

Collected by: Jack DeLay

Site Address: Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

ANALYSIS REQUESTED: Asbestos by PLM with Dispersion Staining

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Please e-mail results as soon as available and include copy of submittal with those results.

SAMPLE #	MATERIAL DESCRIPTION/LOCATION
ECG-14-2959-01I	Drywall and Joint Compound / Main Building, Barracks 1 at Northwest Corner
ECG-14-2959-01J	Drywall and Joint Compound / Main Building, Barracks 2 at Northeast Corner
ECG-14-2959-02A	Drywall Texture # 1 (Knockdown Style) / Main Building, Dining at South Wall
ECG-14-2959-02B	Drywall Texture # 1 (Knockdown Style) / Main Building, TV Room at West Wall
ECG-14-2959-02C	Drywall Texture # 1 (Knockdown Style) / Main Building, Office at West Wall
ECG-14-2959-02D	Drywall Texture # 1 (Knockdown Style) / Main Building, Restroom at Barracks 1 at East Wall
ECG-14-2959-02E	Drywall Texture # 1 (Knockdown Style) / Main Building, Corridor at Barracks 2 at East Wall
ECG-14-2959-02F	Drywall Texture # 1 (Knockdown Style) / Main Building, Restroom at Barracks 2 at East Wall

Delivered by: J DeLay **Date:** 1/17/14 **Time:** 0745hrs.

Received by: [illegible] **Date:** 1/17/14 **Time:** 830

60/96

ENTEK

BULK ASBESTOS MATERIAL *Analysis Request Form for* ***Entek Consulting Group, Inc.***

4200 ROCKLIN ROAD, STE. 7
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(916) 632-6800
FAX (916) 632-6812

Date of Sampling: January 15 & 16, 2014

Lab: Asbestech

Job Number: 14-2959

Turnaround Time: Tuesday, January 21, 2014 at 5:00pm

Client Name: Nichols, Melburg & Rosetto

Collected by: Jack DeLay

Site Address: Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

ANALYSIS REQUESTED: Asbestos by PLM with Dispersion Staining

Special Instruction:
Stop Analysis upon first positive result (>1%) for sample in a series. Also stop analysis upon first positive result (>1%) in the joint compound for sample series.

Please e-mail results as soon as available and include copy of submittal with those results.

SAMPLE #	MATERIAL DESCRIPTION/LOCATION
ECG-14-2959-02G	Drywall Texture # 1 (Knockdown Style) / Main Building, Barracks 2 at North Wall
ECG-14-2959-03A	Drywall Texture # 2 (Splatter Style) / Main Building, Kitchen at North Wall
ECG-14-2959-03B	Drywall Texture # 2 (Splatter Style) / Main Building, Kitchen at West Wall
ECG-14-2959-03C	Drywall Texture # 2 (Splatter Style) / Main Building, Main Corridor at West Wall
ECG-14-2959-04A	Drywall Texture # 3 (Skip Trowel Style) / Main Building, Reception at North Wall
ECG-14-2959-04B	Drywall Texture # 3 (Skip Trowel Style) / Main Building, Reception at South Wall
ECG-14-2959-04C	Drywall Texture # 3 (Skip Trowel Style) / Main Building, Restroom at Barracks 1 at North Wall
ECG-14-2959-04D	Drywall Texture # 3 (Skip Trowel Style) / Main Building, Barracks 1 at North Wall

Delivered by: J DeLay **Date:** 1/17/14 **Time:** 0745hrs.

Received by: [illegible] **Date:** 1/17/14 **Time:** 830

60196

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BULK ASBESTOS MATERIAL *Analysis Request Form for* ***Entek Consulting Group, Inc.***

4200 ROCKLIN ROAD, STE. 7
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Date of Sampling: January 15 & 16, 2014

Lab: Asbestech

Job Number: 14-2959

Turnaround Time: Tuesday, January 21, 2014 at 5:00pm

Client Name: Nichols, Melburg & Rosetto

Collected by: Jack DeLay

Site Address: Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

ANALYSIS REQUESTED: Asbestos by PLM with Dispersion Staining

Special Instruction:
Stop Analysis upon first positive result (>1%) for sample in a series. Also stop analysis upon first positive result (>1%) in the joint compound for sample series.

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SAMPLE #	MATERIAL DESCRIPTION/LOCATION
ECG-14-2959-04E	Drywall Texture # 3 (Skip Trowel Style) / Main Building, Barracks 1 at East Wall
ECG-14-2959-05A	Cove Base (Black) With Yellow Adhesive / Main Building, Dining at East Wall
ECG-14-2959-06A	Cove Base (Gray) With White and Brown Adhesives / Main Building, Kitchen at North Wall
ECG-14-2959-07A	Cove Base (Brown) With Brown Adhesive / Main Building, Pantry at North Wall
ECG-14-2959-08A	Sheet Vinyl Flooring (Gray With White Specks) / Main Building, Doorway at Main Corridor/Dining Intersection
ECG-14-2959-08B	Sheet Vinyl Flooring (Gray With White Specks) / Main Building, Restroom at Barracks 2 at West Side of Entry
ECG-14-2959-09A	Sheet Vinyl Flooring (Brown Mosaic) / Main Building, Pantry at East Side of Entry
ECG-14-2959-10A	Sheet Vinyl Flooring (Tan With White Specks) / Main Building, Doorway at Main Corridor/Dining Intersection

Delivered by: J. DeLay **Date:** 1/17/14 **Time:** 0745 hrs.

Received by: [illegible] **Date:** 1/17/14 **Time:** 830

ENTEK

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BULK ASBESTOS MATERIAL *Analysis Request Form for* ***Entek Consulting Group, Inc.***

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(916) 632-6800
FAX (916) 632-6812

Date of Sampling: January 15 & 16, 2014

Lab: Asbestech

Job Number: 14-2959

Turnaround Time: Tuesday, January 21, 2014 at 5:00pm

Client Name: Nichols, Melburg & Rosetto

Collected by: Jack DeLay

Site Address: Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

ANALYSIS REQUESTED: Asbestos by PLM with Dispersion Staining

Special Instruction:
Stop Analysis upon first positive result (>1%) for sample in a series. Also stop analysis upon first positive result (>1%) in the joint compound for sample series.

Please e-mail results as soon as available and include copy of submittal with those results.

SAMPLE #	MATERIAL DESCRIPTION/LOCATION
ECG-14-2959-10B	Sheet Vinyl Flooring (Tan With White Specks) / Main Building, Restroom 1 at North Side of Entry Doorway
ECG-14-2959-11A	Sheet Vinyl Flooring (Pink & Gray Mosaic) / Main Building, Entry to Shower at Barracks 1
ECG-14-2959-12A	Sheet Vinyl Flooring (Gray Mosaic) / Main Building, Corridor at Laundry at West Side of Doorway Entry
ECG-14-2959-12B	Sheet Vinyl Flooring (Gray Mosaic) / Main Building, Restroom at Barracks 1 at East Side of Doorway
ECG-14-2959-13A	Sheet Vinyl Flooring (Tan Mosaic) / Main Building, Corridor at Barracks 2 at Doorway to Barracks 1
ECG-14-2959-14A	9" Vinyl Floor Tile (Beige) With Black Mastic / Main Building, Closet in TV Room
ECG-14-2959-15A	9" Vinyl Floor Tile (Green) With Black Mastic / Main Building, Garage Mezzanine Storage
ECG-14-2959-16A	9" Vinyl Floor Tile (Gray With Brown Streaks) With Black Mastic / Main Building, Lookout Tower

Delivered by: J DeLay **Date:** 1/17/14 **Time:** 0745 hrs.

Received by: [illegible] **Date:** 1/17/14 **Time:** 830

60196

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BULK ASBESTOS MATERIAL *Analysis Request Form for* ***Entek Consulting Group, Inc.***

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Date of Sampling: January 15 & 16, 2014

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Job Number: 14-2959

Turnaround Time: Tuesday, January 21, 2014 at 5:00pm

Client Name: Nichols, Melburg & Rosetto

Collected by: Jack DeLay

Site Address: Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

ANALYSIS REQUESTED: Asbestos by PLM with Dispersion Staining

Special Instruction:
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SAMPLE #	MATERIAL DESCRIPTION/LOCATION
ECG-14-2959-17A	12" Vinyl Floor Tile (Cream With Orangish Streaks) With Black Mastic / Main Building, South Reception Entry (At Garage) at West Side of Doorway
ECG-14-2959-17B	12" Vinyl Floor Tile (Cream With Orangish Streaks) With Black Mastic / Main Building, Reception at East Side Beneath Desk
ECG-14-2959-18A	Carpet Adhesive (Light Brown) / Main Building, Northwest Corner of Office
ECG-14-2959-18B	Carpet Adhesive (Light Brown) / Main Building, Barracks 2 at Northeast Corner
ECG-14-2959-19A	Brick Mortar / Main Building, Planting Beds at West Side of Building
ECG-14-2959-19B	Brick Mortar / Main Building, Fence Pylaster (Located Southwest of Main Building)
ECG-14-2959-20A	Concrete / Main Building, Pad at Stairs to Lookout Tower
ECG-14-2959-20B	Concrete / Main Building, Building Foundation at Southeast Corner (at Barracks 2 Restroom)

Delivered by: J DeLay **Date:** 1/17/14 **Time:** 0745hrs.

Received by: [illegible] **Date:** 1/17/14 **Time:** 870

60196

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Date of Sampling: January 15 & 16, 2014

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Turnaround Time: Tuesday, January 21, 2014 at 5:00pm

Client Name: Nichols, Melburg & Rosetto

Collected by: Jack DeLay

Site Address: Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

ANALYSIS REQUESTED: Asbestos by PLM with Dispersion Staining

Special Instruction:
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SAMPLE #	MATERIAL DESCRIPTION/LOCATION
ECG-14-2959-20C	Concrete / Main Building, Curb at North Side
ECG-14-2959-21A	Silver Paint on Penetration Mastic / Main Building, West Side at Kitchen Plumbing Vent
ECG-14-2959-22A	Roof Mastic / Main Building, West Side at Kitchen Plumbing Vent
ECG-14-2959-23A	Elastomeric Style Sealant / Main Building, Roof Penetration at West Side
ECG-14-2959-24A	Attic Insulation (White) / Main Building, South End
ECG-14-2959-24B	Attic Insulation (White) / Main Building, Middle of West Side
ECG-14-2959-24C	Attic Insulation (White) / Main Building, West Side at Dining Access
ECG-14-2959-24D	Attic Insulation (White) / Main Building, West of Laundry Access

Delivered by: J DeLay **Date:** 1/17/14 **Time:** 0745 hrs.

Received by: [illegible] **Date:** 1/17/14 **Time:** 0820

60196

ENTEK

BULK ASBESTOS MATERIAL *Analysis Request Form for* ***Entek Consulting Group, Inc.***

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Date of Sampling: January 15 & 16, 2014

Lab: Asbestech

Job Number: 14-2959

Turnaround Time: Tuesday, January 21, 2014 at 5:00pm

Client Name: Nichols, Melburg & Rosetto

Collected by: Jack DeLay

Site Address: Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

ANALYSIS REQUESTED: Asbestos by PLM with Dispersion Staining

Special Instruction:
Stop Analysis upon first positive result (>1%) for sample in a series. Also stop analysis upon first positive result (>1%) in the joint compound for sample series.

Please e-mail results as soon as available and include copy of submittal with those results.

SAMPLE #	MATERIAL DESCRIPTION/LOCATION
ECG-14-2959-24E	Attic Insulation (White) / Main Building, North of Laundry Access
ECG-14-2959-24F	Attic Insulation (White) / Main Building, East of Laundry Access
ECG-14-2959-24G	Attic Insulation (White) / Main Building, East End
ECG-14-2959-25A	Attic Insulation (Brown) / Main Building, South End
ECG-14-2959-25B	Attic Insulation (Brown) / Main Building, Middle of West Side
ECG-14-2959-25C	Attic Insulation (Brown) / Main Building, West Side at Dining Access
ECG-14-2959-25D	Attic Insulation (Brown) / Main Building, West of Laundry Access
ECG-14-2959-25E	Attic Insulation (Brown) / Main Building, North of Laundry Access

Delivered by: J DeLay **Date:** 1/17/14 **Time:** 0745 hrs.

Received by: [illegible] **Date:** 1/17/14 **Time:** 830

60196

ENTEK

BULK ASBESTOS MATERIAL *Analysis Request Form for* ***Entek Consulting Group, Inc.***

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FAX (916) 632-6812

Date of Sampling: January 15 & 16, 2014

Lab: Asbestech

Job Number: 14-2959

Turnaround Time: Tuesday, January 21, 2014 at 5:00pm

Client Name: Nichols, Melburg & Rosetto

Collected by: Jack DeLay

Site Address: Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

ANALYSIS REQUESTED: Asbestos by PLM with Dispersion Staining

Special Instruction:
Stop Analysis upon first positive result (>1%) for sample in a series. Also stop analysis upon first positive result (>1%) in the joint compound for sample series.

Please e-mail results as soon as available and include copy of submittal with those results.

SAMPLE #	MATERIAL DESCRIPTION/LOCATION
ECG-14-2959-25F	Attic Insulation (Brown) / Main Building, East of Laundry Access
ECG-14-2959-25G	Attic Insulation (Brown) / Main Building, East End
ECG-14-2959-26A	Sponge-Applied Drywall Texture / Main Building, West Wall of Kitchen
ECG-14-2959-26B	Sponge-Applied Drywall Texture / Main Building, Middle of Ceiling
ECG-14-2959-26C	Sponge-Applied Drywall Texture / Main Building, North Side of Kitchen Ceiling

C:\Entek\Clients\Nichols, Melburg & Rosetto\14-2959 Vina Helitack Base - Asb, PB, & Specs\Bulk Sample Asb\Bulk Request 01-15-14.wpd

Delivered by: J DeLay **Date:** 1/17/14 **Time:** 0745 hrs.

Received by: [illegible] **Date:** 1/17/14 **Time:** 870

60209

ENTEK

BULK ASBESTOS MATERIAL *Analysis Request Form for* ***Entek Consulting Group, Inc.***

4200 ROCKLIN ROAD, STE. 7
ROCKLIN, CA 95677
(916) 632-6800
FAX (916) 632-6812

Date of Sampling: January 23, 2014

Lab: Asbestech

Job Number: 14-2959

Turnaround Time: Friday, January 24, 2014 at 12:00pm

Client Name: Nichols, Melburg & Rosetto

Collected by: Jack DeLay

Site Address: Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

ANALYSIS REQUESTED: Asbestos by PLM with Dispersion Staining

Special Instruction:
Stop Analysis upon first positive result (>1%) for sample in a series. Also stop analysis upon first positive result (>1%) in the joint compound for sample series.

Please e-mail results as soon as available and include copy of submittal with those results.

SAMPLE #	MATERIAL DESCRIPTION/LOCATION
ECG-14-2959-27A	Drywall and Joint Compound / Main Building, Reception at East Side at Wall/Ceiling Intersection
ECG-14-2959-27B	Drywall and Joint Compound / Main Building, Reception at North Side at Wall/Ceiling Intersection
ECG-14-2959-28A	Drywall and Joint Compound / Main Building, TV Room, South End of East Wall at Wall/Ceiling Intersection
ECG-14-2959-28B	Drywall and Joint Compound / Main Building, TV Room, Middle of North Side at Wall/Ceiling Intersection
ECG-14-2959-29A	Drywall and Joint Compound / Main Building, Office, Middle of East Wall at Wall/Ceiling Intersection
ECG-14-2959-30A	Drywall and Joint Compound / Main Building, Restroom 1, North Side Above Shower Unit at Wall/Ceiling Intersection
ECG-14-2959-31A	Drywall and Joint Compound / Main Building, Pantry, North Side Above Doorway at Wall/Ceiling Intersection
ECG-14-2959-32A	Drywall and Joint Compound / Main Building, Kitchen, North Side Above Doorway Leading to Dining at Wall/Ceiling Intersection

Delivered by: J DeLay **Date:** 1/23/14 **Time:** 1115 hrs.

Received by: [illegible] **Date:** 1/23/14 **Time:** 1115 hrs

ENTEK

60209

BULK ASBESTOS MATERIAL *Analysis Request Form for* ***Entek Consulting Group, Inc.***

4200 ROCKLIN ROAD, STE. 7
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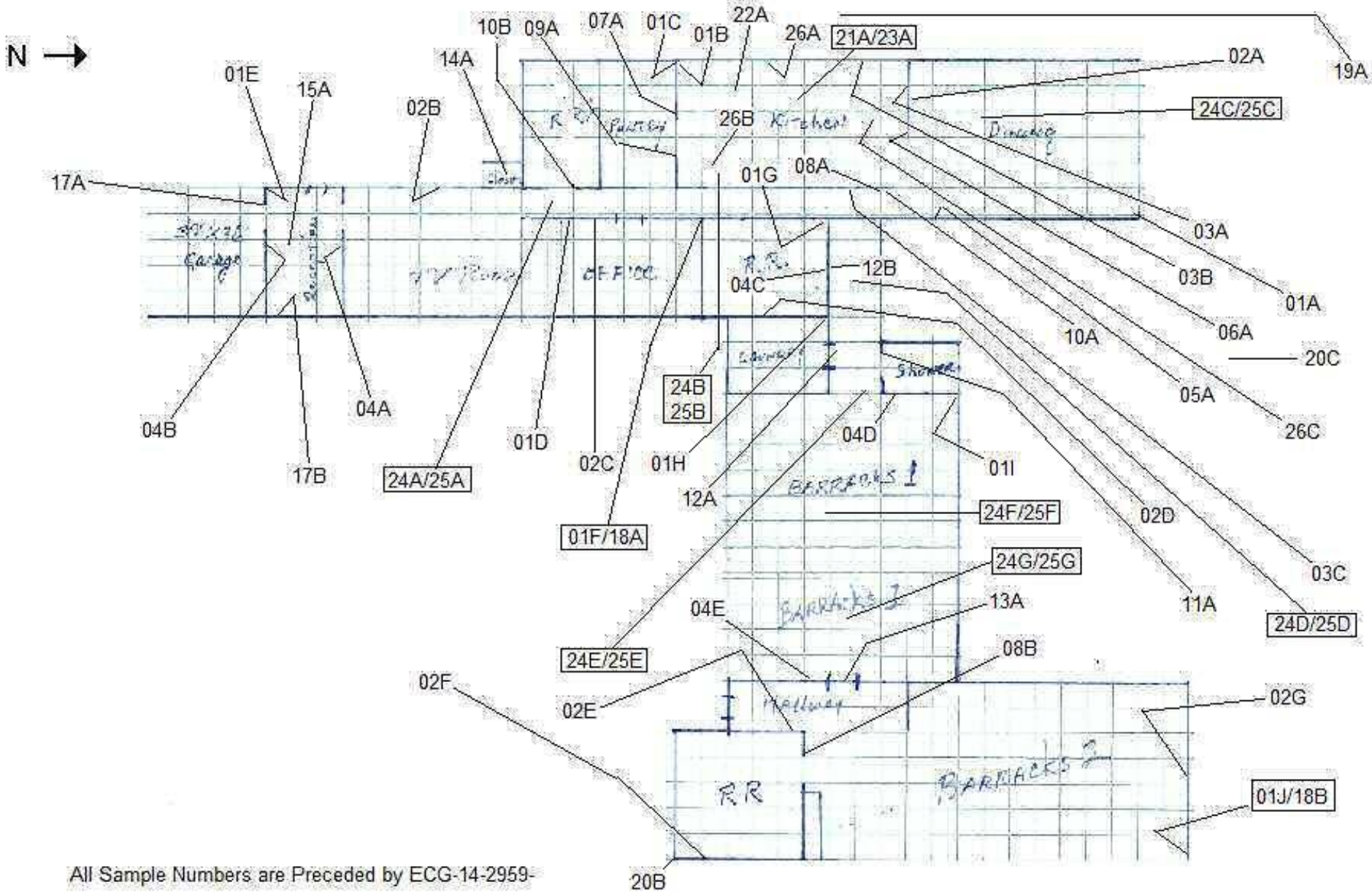
SAMPLE #	MATERIAL DESCRIPTION/LOCATION
ECG-14-2959-33A	Drywall and Joint Compound / Main Building, Dining, East Side Above Exit Door at Wall/Ceiling Intersection
ECG-14-2959-34A	Drywall and Joint Compound / Main Building, Barracks 1 Restroom, North Side Above Doorway at Wall/Ceiling Intersection
ECG-14-2959-35A	Sheet Vinyl Flooring (Tan Mosaic) / Main Building, Barracks 1 Shower at Entry Doorway

C:\Entek\Clients\Nichols, Melburg & Rosetto\14-2959 Vina Helitack Base - Asb, PB, & Specs\Bulk Sample Asb\Bulk Request 01-23-14.wpd

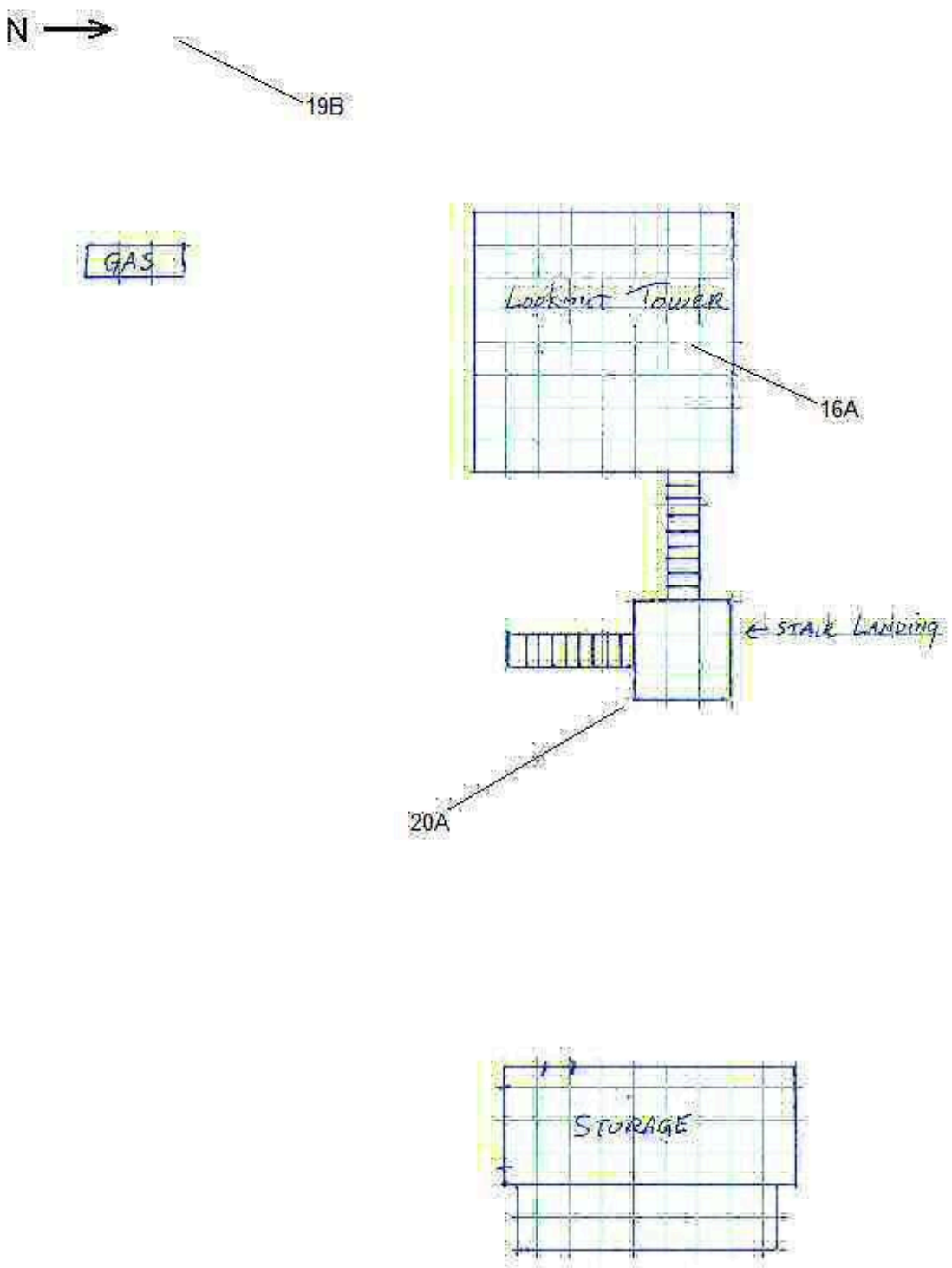
Delivered by: [signature] **Date:** 1/23/14 **Time:** 1115 hrs.

Received by: [signature] **Date:** 1/23/14 **Time:** 1115 hrs



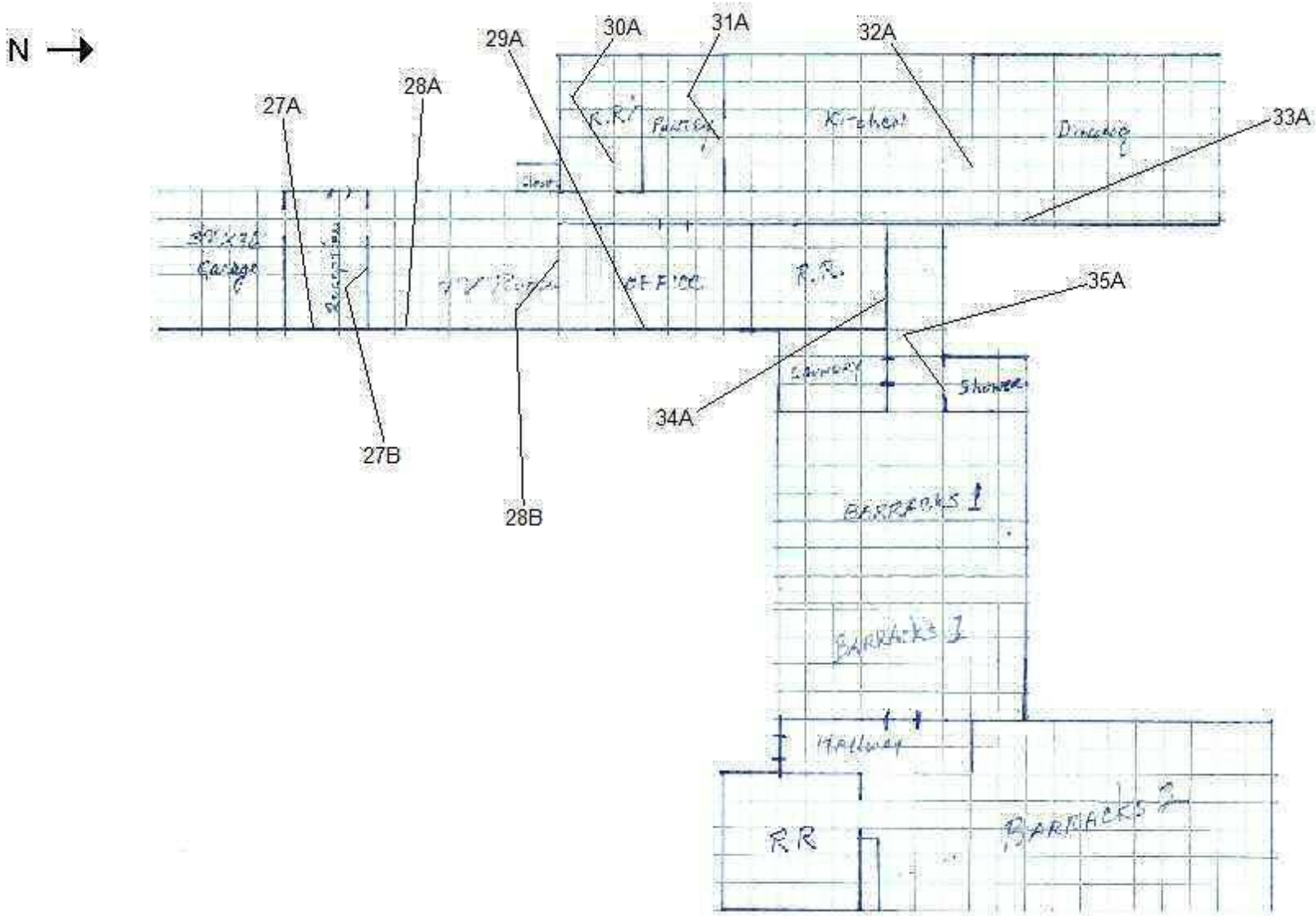
All Sample Numbers are Preceded by ECG-14-2959-

Vina Helitack Base 4520 Highway 99E Vina, CA 96092	Entek Consulting Group, Inc. 4200 Rocklin Road, Suite 7 Rocklin, CA 95677 Map Not to Scale	Approximate Asbestos Sample Locations Collected by Jack DeLay on January 15&16, 2014 Entek Project Number 14-2959



All Sample Numbers are Preceded by ECG-14-2959-

Vina Helitack Base 4520 Highway 99E Vina, CA 96092	Entek Consulting Group, Inc. 4200 Rocklin Road, Suite 7 Rocklin, CA 95677 Map Not to Scale	Approximate Asbestos Sample Locations Collected by Jack DeLay on January 15&16, 2014 Entek Project Number 14-2959



Vina Helitack Base 4520 Highway 99E Vina, CA 96092	Entek Consulting Group, Inc. 4200 Rocklin Road, Suite 7 Rocklin, California 95677 Map Not to Scale	Approximate Asbestos Sample Locations Collected by Jack DeLay on January 23, 2014 Entek Project Number 14-2959

APPENDIX B

LEAD RELATED DOCUMENTS

- Lead in Paint Samples Analysis Reports From Asbestech
- Bulk Lead Material Analysis Request Forms for Entek
- XRF - Lead Testing Data Sheets (OSHA)
- Niton XLp (XRF) Calibration Check Test Results
- Bulk Paint Chip Sample Locations Drawing
- Positive XRF Testing Locations Drawing
- Lead Hazard Evaluation Report (CDPH 8552)

ASBESTECH
6825 Fair Oaks Blvd., Suite 103
Carmichael, California 95608
Tel (916) 481-8902
Fax (916) 481-3975

FLAME ATOMIC ABSORPTION SPECTROMETRY
LEAD (Pb) IN PAINT SAMPLES
METHOD SW846-3050B-7420

CLIENT:
Entek Consulting Group, Inc.
4200 Rocklin Rd., Suite 7
Rocklin, CA 95677

CDPH ELAP#1153
ELPAT#101801

JOB I.D: 14-2959, Nichols, Melburg & Rosetto,
Vina Helitack Base,
Vina, Ca

DATE RECEIVED: 1/17/14

DATE ANALYZED: 1/20/14

LAB JOB NO: 9930-1

DATE REPORTED: 1/21/14

SAMPLE DATE	SAMPLE NUMBER	DESCRIPTION	PPM	RESULT IN WT%	RL	Q.C. BATCH
1/16/14	ECG-14-2959-01Pb	Blue-green paint, main bldg. garage door frame	13000	1.3	0.0050%	8
1/16/14	ECG-14-2959-02Pb	Light green coating, main bldg. siding at north side	53	0.0053	0.0050%	8
1/16/14	ECG-14-2959-03Pb	Dark green coating, main bldg. SE corner at metal corner board	<50	<0.0050	0.0050%	8
1/16/14	ECG-14-2959-04Pb	Tan paint, main bldg. wood support post at kitchen entry	<50	<0.0050	0.0050%	8
1/16/14	ECG-14-2959-05Pb	Tan paint, main bldg. metal door at kitchen entry	<50	<0.0050	0.0050%	8
1/16/14	ECG-14-2959-06Pb	Tan paint, main bldg. stair handrail at lookout tower	210	0.021	0.0050%	8
1/16/14	ECG-14-2959-07Pb	Dark green paint, main bldg. stair tread at lookout tower	74000	7.4	0.0050%	8
1/16/14	ECG-14-2959-08Pb	Tan paint, main bldg. interior wood wall in lookout tower	980	0.098	0.0050%	8
1/16/14	ECG-14-2959-09Pb	White paint, main bldg. gypsum board wall at north wall in office	<50	<0.0050	0.0050%	8
1/16/14	ECG-14-2959-10Pb	Varnish, main bldg. wood wall paneling at south side of office	300	0.030	0.0050%	8
1/16/14	ECG-14-2959-11Pb	Brown paint, main bldg. wood wall in restroom #1 at west wall	<50	<0.0050	0.0050%	8
1/16/14	ECG-14-2959-12Pb	Brown paint, main bldg. gypsum board wall at north wall of dining	<50	<0.0050	0.0050%	8

Analytical results and reports are generated at the request and for the exclusive use of the client. This report applies only to the items tested. Samples were not collected by ASBESTECH. This report must not be reproduced except in full, and only with the express permission of ASBESTECH. This report must not be used to claim product endorsement by any agency of the U.S. Government.

LABORATORY DIRECTOR: TOM CONLON

ANALYST: JIM JUNGLES

ASBESTECH
6825 Fair Oaks Blvd., Suite 103
Carmichael, California 95608
Tel (916) 481-8902
Fax (916) 481-3975

FLAME ATOMIC ABSORPTION SPECTROMETRY
LEAD (Pb) IN PAINT SAMPLES
METHOD SW846-3050B-7420

CLIENT:
Entek Consulting Group, Inc.
4200 Rocklin Rd., Suite 7
Rocklin, CA 95677

CDPH ELAP#1153
ELPAT#101801

JOB I.D: 14-2959, Nichols, Melburg & Rosetto,
Vina Helitack Base,
Vina, Ca

DATE RECEIVED: 1/17/14

DATE ANALYZED: 1/20/14

LAB JOB NO: 9930-2

DATE REPORTED: 1/21/14

SAMPLE DATE	SAMPLE NUMBER	DESCRIPTION	PPM	RESULT IN WT%	RL	Q.C. BATCH
1/16/14	ECG-14-2959-13Pb	White paint, main bldg. pantry cabinet	<50	<0.0050	0.0050%	8
1/16/14	ECG-14-2959-14Pb	White paint, main bldg. north gypsum board wall in barracks 1 shower	<50	<0.0050	0.0050%	8
1/16/14	ECG-14-2959-15Pb	Varnish, main bldg. wood partitions at barracks 1 bunk area	<50	<0.0050	0.0050%	8
1/16/14	ECG-14-2959-16Pb	Cream paint, main bldg. gypsum board wall at south side of barracks 2 restroom	<50	<0.0050	0.0050%	8
1/16/14	ECG-14-2959-17Pb	White paint, main bldg. gypsum board wall at west side of barracks 2	<50	<0.0050	0.0050%	8
1/16/14	ECG-14-2959-18Pb	Light brown paint, main bldg. metal door frame north side of barracks 2	<50	<0.0050	0.0050%	8
1/16/14	ECG-14-2959-19Pb	Blue- green paint, storage unit east of main bldg. at metal door frame	<50	<0.0050	0.0050%	8
1/16/14	ECG-14-2959-20Pb	White paint, concrete gasoline vessel south of main bldg.	<50	<0.0050	0.0050%	8

Analytical results and reports are generated at the request and for the exclusive use of the client. This report applies only to the items tested. Samples were not collected by ASBESTECH. This report must not be reproduced except in full, and only with the express permission of ASBESTECH. This report must not be used to claim product endorsement by any agency of the U.S. Government.

LABORATORY DIRECTOR: TOM CONLON

ANALYST: JIM JUNGLES

9 930

ENTEK

BULK LEAD MATERIAL *Analysis Request Form for* ***Entek Consulting Group, Inc.***

4200 ROCKLIN ROAD; SUITE 7
ROCKLIN, CA 95677
(916) 632-6800
FAX (916) 632-6812

Date of Sampling: January 16, 2014

Lab: Asbestech

Job Number: 14-2959

Turnaround Time: Tuesday, January 21, 2014 at 5:00pm

Client Name: Nichols, Melburg & Rosetto

Collected by: Jack DeLay

Site Address: Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

ANALYSIS REQUESTED: Lead by Atomic Absorption Spectrometry

Special Instruction: *Please report result in PPM and % by weight.* *Please email results as soon as possible.*

B 8

SAMPLE #	MATERIAL DESCRIPTION/LOCATION	
ECG-14-2959-01Pb	Blue-Green Paint / Main Building, Garage Door Frame	13000/1.3
ECG-14-2959-02Pb	Light Green Coating / Main Building, Siding at North Side	531/.0053
ECG-14-2959-03Pb	Dark Green Coating / Main Building, Southeast Corner at Metal Corner Board	<
ECG-14-2959-04Pb	Tan Paint / Main Building, Wood Support Post at Kitchen Entry	<
ECG-14-2959-05Pb	Tan Paint / Main Building, Metal Door at Kitchen Entry	<
ECG-14-2959-06Pb	Tan Paint / Main Building, Stair Handrail at Lookout Tower	210/.021
ECG-14-2959-07Pb	Dark Green Paint / Main Building, Stair Tread at Lookout Tower	74000/7.4
ECG-14-2959-08Pb	Tan Paint / Main Building, Interior Wood Wall in Lookout Tower	480/.048
ECG-14-2959-09Pb	White Paint / Main Building, Gypsum Board Wall at North Wall in Office	<
ECG-14-2959-10Pb	Varnish / Main Building, Wood Wall Paneling at South Side of Office	300/.030
ECG-14-2959-11Pb	Brown Paint / Main Building, Wood Wall in Restroom # 1 at West Wall	<
ECG-14-2959-12Pb	Brown Paint / Main Building, Gypsum Board Wall at North Wall of Dining	<
ECG-14-2959-13Pb	White Paint / Main Building, Pantry Cabinet	<
ECG-14-2959-14Pb	White Paint / Main Building, North Gypsum Board Wall in Barracks 1 Shower	<
ECG-14-2959-15Pb	Varnish / Main Building, Wood Partitions at Barracks 1 Bunk Area	<

Delivered by: J. DeLay **Date:** 1/17/14 **Time:** 0745 hrs

Received by: [illegible] **Date:** 1/17/14 **Time:** 830

9930

ENTEK

BULK LEAD MATERIAL *Analysis Request Form for* ***Entek Consulting Group, Inc.***

4200 ROCKLIN ROAD; SUITE 7
ROCKLIN, CA 95677
(916) 632-6800
FAX (916) 632-6812

Date of Sampling: January 16, 2014

Lab: Asbestech

Job Number: 14-2959

Turnaround Time: Tuesday, January 21, 2014 at 5:00pm

Client Name: Nichols, Melburg & Rosetto

Collected by: Jack DeLay

Site Address: Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

ANALYSIS REQUESTED: Lead by Atomic Absorption Spectrometry

Special Instruction: *Please report result in PPM and % by weight.* *Please email results as soon as possible.*

SAMPLE #	MATERIAL DESCRIPTION/LOCATION	
ECG-14-2959-16Pb	Cream Paint / Main Building, Gypsum Board Wall at South Side of Barracks 2 Restroom	<
ECG-14-2959-17Pb	White Paint / Main Building, Gypsum Board Wall at West Side of Barracks 2	<
ECG-14-2959-18Pb	Light Brown Paint / Main Building, Metal Door Frame, North Side of Barracks 2	<
ECG-14-2959-19Pb	Blue-Green Paint / Storage Unit (East of Main Building), at Metal Door Frame	<
ECG-14-2959-20Pb	White Paint / Concrete Gasoline Vessel South of Main Building	<

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Delivered by: J DeLay **Date:** 1/17/14 **Time:** 0745 hrs.

Received by: [illegible] **Date:** 1/17/14 **Time:** 830

Lead Testing Data Sheet (OSHA)
Nichols, Melburg & Rosetto

Entek Project #14-2959

Niton: XLP-300 Lead Analyzer

Date: January 16, 2014

Address: Cal Fire- Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

XRF Serial No.: 24015

Source No.: TR2725

Room Equivalent: MAIN BUILDING - EXTERIOR

Inspector: Jack DeLay

Component	Substrate	Color	Test Locations	XRF Reading (mg/cm^2)
DOOR FRAME	WOOD	BLUE-GREEN	GARAGE DOOR FRAME	0.26
SIDING	METAL	LIGHT GREEN	WEST SIDE OF GARAGE	0.00
DOWN SPOUT	METAL	BLUE-GREEN	WEST SIDE NEAR RECEPTION	0.14
SUPPORT COLUMN	WOOD	TAN	RECEPTION ENTRY	**4.5**
DOOR	WOOD	TAN	RECEPTION ENTRY	**4.1**
DOOR FRAME	WOOD	GREEN	RECEPTION ENTRY	**4.5**
SUPPORT COLUMN	WOOD	TAN	PATIO AT KITCHEN ENTRY	0.00
STRIPING PAINT	CONCRETE	YELLOW	PATIO AT KITCHEN ENTRY	**2.6**
DOOR	METAL	TAN	PATIO AT KITCHEN ENTRY	0.00
SIDING	METAL	LIGHT GREEN	PATIO AT KITCHEN ENTRY	0.00
FOUNDATION	CONCRETE	BLUE-GREEN	NORTH END OF WEST SIDE	0.00
DOOR	METAL	TAN	EAST ENTRY TO DINING	0.00
STRIPING PAINT	CONCRETE	YELLOW	NORTH ENTRY TO BARRACKS 2	**2.8**
STAIR STRINGER	METAL	DARK GREEN	STAIRS TO LOOKOUT TOWER	0.30
HAND RAIL	METAL	TAN	STAIRS TO LOOKOUT TOWER	0.30
STAIR TREAD	METAL	DARK GREEN	STAIRS TO LOOKOUT TOWER	0.04

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All XRF Readings $\geq$1.0 mg/cm^2 = Lead Based Paint (LBP)

All XRF Readings <1.0 mg/cm^2 = Lead Containing Coating (LCC)

Lead Testing Data Sheet (OSHA)
Nichols, Melburg & Rosetto

Entek Project #14-2959

Niton: XLP-300 Lead Analyzer

Date: January 16, 2014

Address: Cal Fire- Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

XRF Serial No.: 24015

Source No.: TR2725

Room Equivalent: MAIN BUILDING - EXTERIOR

Inspector: Jack DeLay

Component	Substrate	Color	Test Locations	XRF Reading (mg/cm^2)
SUPPORT FRAME	METAL	DARK GREEN	STAIRS TO LOOKOUT TOWER	0.23
PICNIC TABLE	CONCRETE	DARK GREEN	EAST SIDE AT STAIRS TO LOOKOUT TOWER	0.01

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All XRF Readings $\geq$1.0 mg/cm^2 = Lead Based Paint (LBP)

All XRF Readings <1.0 mg/cm^2 = Lead Containing Coating (LCC)

Lead Testing Data Sheet (OSHA)
Nichols, Melburg & Rosetto

Entek Project #14-2959

Niton: XLP-300 Lead Analyzer

Date: January 16, 2014

Address: Cal Fire- Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

XRF Serial No.: 24015

Source No.: TR2725

Room Equivalent: LOOKOUT TOWER

Inspector: Jack DeLay

Component	Substrate	Color	Test Locations	XRF Reading (mg/cm^2)
DOOR	WOOD	OLIVE GREEN	INTERIOR - EAST SIDE	0.00
DOOR FRAME	WOOD	TAN	INTERIOR - EAST SIDE	**1.7**
WINDOW SILL	WOOD	TAN	INTERIOR - NORTH SIDE	0.26
WALL	WOOD	TAN	INTERIOR - NORTH SIDE	0.22
SIDING	METAL	LIGHT GREEN	EXTERIOR - EAST SIDE	0.00
CORNER BOARD	METAL	DARK GREEN	EXTERIOR - NORTHEAST CORNER	0.00

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All XRF Readings $\geq$1.0 mg/cm^2 = Lead Based Paint (LBP)

All XRF Readings <1.0 mg/cm^2 = Lead Containing Coating (LCC)

Lead Testing Data Sheet (OSHA)
Nichols, Melburg & Rosetto

Entek Project #14-2959

Niton: XLP-300 Lead Analyzer

Date: January 16, 2014

Address: Cal Fire- Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

XRF Serial No.: 24015

Source No.: TR2725

Room Equivalent: MAIN BUILDING - INTERIOR

Inspector: Jack DeLay

Component	Substrate	Color	Test Locations	XRF Reading (mg/cm^2)
WALL	WOOD	TAN	WEST WALL OF GARAGE	**1.3**
WALL	DRYWALL	OLIVE GREEN	NORTH WALL OF GARAGE	0.17
STAIR STRINGER	WOOD	TAN	NORTH SIDE OF GARAGE	**1.7**
HAND RAIL	METAL	TAN	NORTH SIDE OF GARAGE	0.09
STRIPING PAINT	CONCRETE	WHITE	GARAGE	0.09
STRIPING PAINT	CONCRETE	YELLOW	GARAGE	0.05
CEILING	WOOD	WHITE	NORTH SIDE OF GARAGE	**3.0**
DESK TOP	WOOD	VARNISH	OFFICE	0.00
WALL	DRYWALL	WHITE	OFFICE	0.06
DOOR	WOOD	VARNISH	OFFICE	0.00
WALL PANELING	WOOD	VARNISH	OFFICE	0.22
DOOR	WOOD	WHITE	OFFICE LEADING TO GARAGE	0.13
WALL	DRYWALL	WHITE	TV ROOM	0.04
WAINSCOT	WOOD	VARNISH	TV ROOM	0.04
CABINET DOOR	WOOD	VARNISH	TV ROOM	0.00
DOOR	WOOD	VARNISH	CLOSET ENTRY	0.00

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All XRF Readings $\geq$1.0 mg/cm^2 = Lead Based Paint (LBP)

All XRF Readings <1.0 mg/cm^2 = Lead Containing Coating (LCC)

Lead Testing Data Sheet (OSHA)
Nichols, Melburg & Rosetto

Entek Project #14-2959

Niton: XLP-300 Lead Analyzer

Date: January 16, 2014

Address: Cal Fire- Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

XRF Serial No.: 24015

Source No.: TR2725

Room Equivalent: MAIN BUILDING - INTERIOR

Inspector: Jack DeLay

Component	Substrate	Color	Test Locations	XRF Reading (mg/cm^2)
WALL	WOOD	BROWN	RESTROOM #1	0.09
WINDOW SILL	WOOD	WHITE	RESTROOM #1	**1.4**
DOOR	WOOD	VARNISH	RESTROOM #1	0.00
WALL	DRYWALL	BROWN	DINING	0.00
DOOR	METAL	BROWN	DINING (EAST EXIT)	0.00
TABLE	WOOD	VARNISH	DINING (EAST EXIT)	0.02
CABINET DOOR	WOOD	VARNISH	KITCHEN	0.00
WALL	DRYWALL	WHITE	KITCHEN	0.00
WINDOW SILL	WOOD	VARNISH	PANTRY	**1.5**
CABINET	WOOD	WHITE	PANTRY	0.00
WALL	DRYWALL	WHITE	PANTRY	0.00
DOOR	WOOD	VARNISH	PANTRY	0.00
DOOR FRAME	WOOD	WHITE	PANTRY	0.00

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All XRF Readings $\geq$1.0 mg/cm^2 = Lead Based Paint (LBP)

All XRF Readings <1.0 mg/cm^2 = Lead Containing Coating (LCC)

Lead Testing Data Sheet (OSHA)
Nichols, Melburg & Rosetto

Entek Project #14-2959

Niton: XLP-300 Lead Analyzer

Date: January 16, 2014

Address: Cal Fire- Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

XRF Serial No.: 24015

Source No.: TR2725

Room Equivalent: BARRACKS 1 - INTERIOR

Inspector: Jack DeLay

Component	Substrate	Color	Test Locations	XRF Reading (mg/cm^2)
WALL	DRYWALL	WHITE	WEST SIDE	0.00
WALL PANELING	WOOD	VARNISH	WEST SIDE	0.01
WALL	DRYWALL	WHITE	SHOWER AT NORTH WALL	0.00
WINDOW SILL	WOOD	WHITE	SHOWER ROOM	0.00
WALL	DRYWALL	WHITE	RESTROOM AT SOUTH WALL	0.00
DOOR	WOOD	VARNISH	RESTROOM ENTRY	0.00
WALL	DRYWALL	WHITE	EAST WALL	0.00
PARTITION	WOOD	VARNISH	BUNK AREA	0.00
WINDOW SILL	WOOD	WHITE	BUNK AREA	0.00

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All XRF Readings $\geq$1.0 mg/cm^2 = Lead Based Paint (LBP)

All XRF Readings <1.0 mg/cm^2 = Lead Containing Coating (LCC)

Lead Testing Data Sheet (OSHA)
Nichols, Melburg & Rosetto

Entek Project #14-2959

Niton: XLP-300 Lead Analyzer

Date: January 16, 2014

Address: Cal Fire- Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

XRF Serial No.: 24015

Source No.: TR2725

Room Equivalent: BARRACKS 2 - INTERIOR

Inspector: Jack DeLay

Component	Substrate	Color	Test Locations	XRF Reading (mg/cm^2)
WALL	DRYWALL	CREAM	RESTROOM AT NORTH WALL	0.00
DOOR	WOOD	VARNISH	RESTROOM	0.00
WINDOW SILL	WOOD	VARNISH	RESTROOM	0.00
WALL	DRYWALL	WHITE	BUNK AREA AT NORTH WALL	0.00
PARTITION	WOOD	VARNISH	BUNK AREA	0.00
WINDOW SILL	WOOD	VARNISH	BUNK AREA	0.00
DOOR	METAL	LIGHT BROWN	BUNK AREA AT NORTH SIDE	0.00

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All XRF Readings $\geq$1.0 mg/cm^2 = Lead Based Paint (LBP)

All XRF Readings <1.0 mg/cm^2 = Lead Containing Coating (LCC)

Lead Testing Data Sheet (OSHA)
Nichols, Melburg & Rosetto

Entek Project #14-2959

Niton: XLP-300 Lead Analyzer

Date: January 16, 2014

Address: Cal Fire- Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

XRF Serial No.: 24015

Source No.: TR2725

Room Equivalent: VARIOUS STRUCTURES

Inspector: Jack DeLay

Component	Substrate	Color	Test Locations	XRF Reading (mg/cm^2)
SIDING	METAL	LIGHT GREEN	WEST SIDE OF PUMP HOUSE (LOCATED NORTH OF MAIN BLDG.)	0.00
CORNER BOARD	METAL	DARK GREEN	WEST SIDE OF PUMP HOUSE (LOCATED NORTH OF MAIN BLDG.)	0.00
RAIN GUTTER	METAL	OLIVE GREEN	WEST SIDE OF PUMP HOUSE (LOCATED NORTH OF MAIN BLDG.)	0.00
PROPANE TANK	METAL	WHITE	NORTH OF MAIN BUILDING	0.01
PROTECTIVE BOLLARD	METAL	YELLOW	FOUR CORNERS OF PROPANE TANK	**1.3**
FIRE HOSE HOUSING	METAL	DARK GREEN	NORTH OF MAIN BUILDING	0.02
SIDING	METAL	LIGHT GREEN	WEST SIDE OF STORAGE UNIT (LOCATED EAST OF MAIN BUILDING)	0.00
CORNER BOARD	METAL	DARK GREEN	SOUTHWEST CORNER OF STORAGE UNIT (LOCATED EAST OF MAIN BUILDING)	0.00
DOOR FRAME	METAL	BLUE-GREEN	WEST SIDE OF STORAGE UNIT (LOCATED EAST OF MAIN BUILDING)	0.00
DOOR	METAL	TAN	WEST SIDE OF STORAGE UNIT (LOCATED EAST OF MAIN BUILDING)	0.00
SUPPORT COLUMN	WOOD	DARK GREEN	CARPORT AT STORAGE UNIT (LOCATED EAST OF MAIN BUILDING)	0.00

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All XRF Readings $\geq$1.0 mg/cm^2 = Lead Based Paint (LBP)

All XRF Readings <1.0 mg/cm^2 = Lead Containing Coating (LCC)

Lead Testing Data Sheet (OSHA)
Nichols, Melburg & Rosetto

Entek Project #14-2959

Niton: XLP-300 Lead Analyzer

Date: January 16, 2014

Address: Cal Fire- Vina Helitack Base
4520 Highway 99E
Vina, CA 96092

XRF Serial No.: 24015

Source No.: TR2725

Room Equivalent: VARIOUS STRUCTURES

Inspector: Jack DeLay

Component	Substrate	Color	Test Locations	XRF Reading (mg/cm^2)
GASOLINE VESSEL	CONCRETE	WHITE	NORTH SIDE OF VESSEL (UNIT LOCATED SOUTH OF MAIN BUILDING)	0.00
PROTECTIVE BOLLARD	METAL	WHITE	NORTHEAST BOLLARD AT GAS VESSEL (UNIT LOCATED SOUTH OF MAIN BUILDING)	0.02
SIDING	METAL	LIGHT GREEN	NORTH SIDE OF STORAGE UNIT (LOCATED SOUTH OF MAIN BUILDING)	0.00
CORNER BOARD	METAL	DARK GREEN	NORTHEAST CORNER OF STORAGE UNIT (LOCATED SOUTH OF MAIN BUILDING)	0.00
SUPPORT COLUMN	WOOD	TAN	NORTH SIDE OF STORAGE UNIT (LOCATED SOUTH OF MAIN BUILDING)	0.00
SUPPORT PEER	CONCRETE	DARK GREEN	BENEATH SUPPORT COLUMN AT STORAGE UNIT (LOCATED SOUTH OF MAIN BUILDING)	**1.6**
DOOR	METAL	TAN	NORTH SIDE OF STORAGE UNIT (LOCATED SOUTH OF MAIN BUILDING)	0.03
FENCE BOARD	WOOD	REDWOOD STAIN	SOUTHWEST OF MAIN BUILDING	0.00

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All XRF Readings $\geq$1.0 mg/cm^2 = Lead Based Paint (LBP)

All XRF Readings <1.0 mg/cm^2 = Lead Containing Coating (LCC)

Calibration Check Test Results

Nichols, Melburg & Rosetto

Site Name:	Vina Helitack Base	Date:	01-16-14
Address:	4520 Highway 99E		
City:	Vina		
Device:	Niton Xlp 300 (40 mCL source)	Source Assay Date:	10-4-13
XRF Serial No.	24015	Source Number:	TR2725
Contractor:	Entek Consulting Group, Inc.		
Inspector Name:	Jack DeLay		
Inspector Signature:	J DeLay		

Calibration Check Tolerance Used 1.04 ±0.06

First Calibration Check 0830 hours

Red SRM (2573) 0.8 to 1.2 mg/cm^2			Do All Three Checks Meet the Standard?
First Reading	Second Reading	Third Reading	YES
1.0	1.0	1.0	

Second Calibration Check 1020 hours

Red SRM (2573) 0.8 to 1.2 mg/cm^2			Do All Three Checks Meet the Standard?
First Reading	Second Reading	Third Reading	YES
1.1	1.1	1.1	

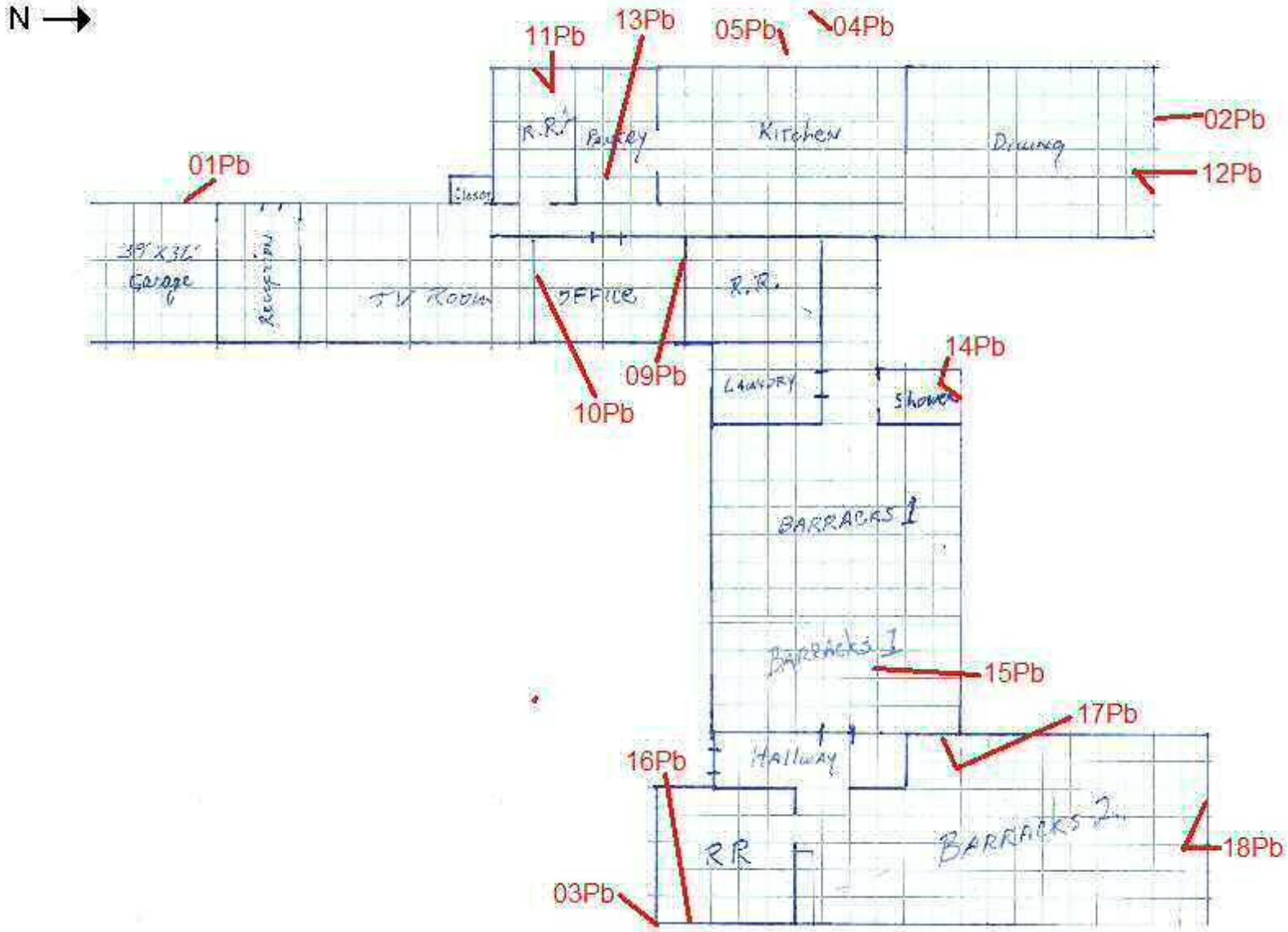
Third Calibration Check N/A

Red SRM (2573) 0.8 to 1.2 mg/cm^2			Do All Three Checks Meet the Standard?
First Reading	Second Reading	Third Reading	N/A
N/A	N/A	N/A	

Fourth Calibration Check N/A

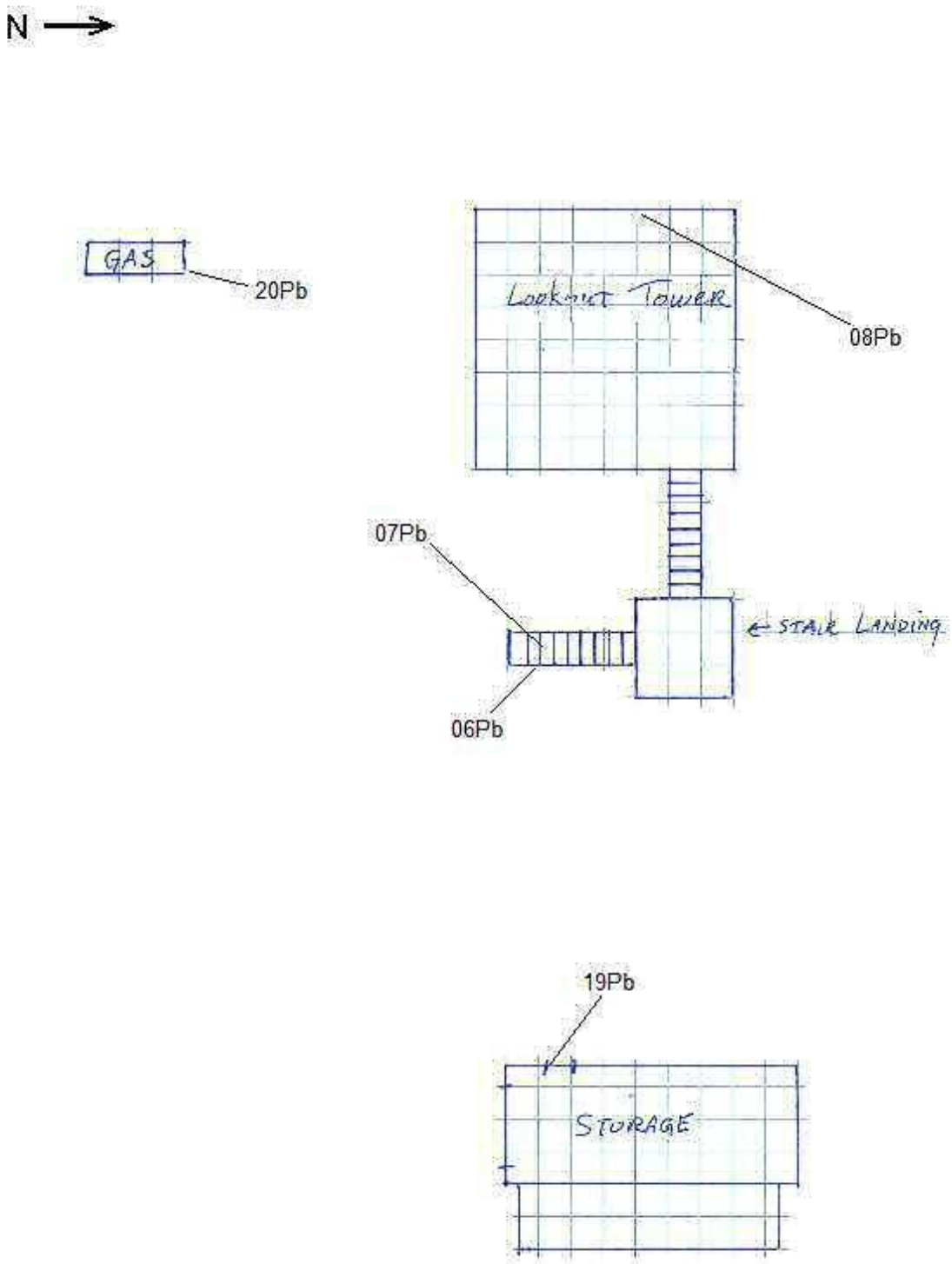
Red SRM (2573) 0.8 to 1.2 mg/cm^2			Do All Three Checks Meet the Standard?
First Reading	Second Reading	Third Reading	N/A
N/A	N/A	N/A	

* If the Calibration Check from the red SRM film value is greater or less than the specified Calibration Check Tolerance for this device, consult the manufacturer's recommendations to bring the instrument back into control. Retest all testing combinations tested since the last successful Calibration Check test.



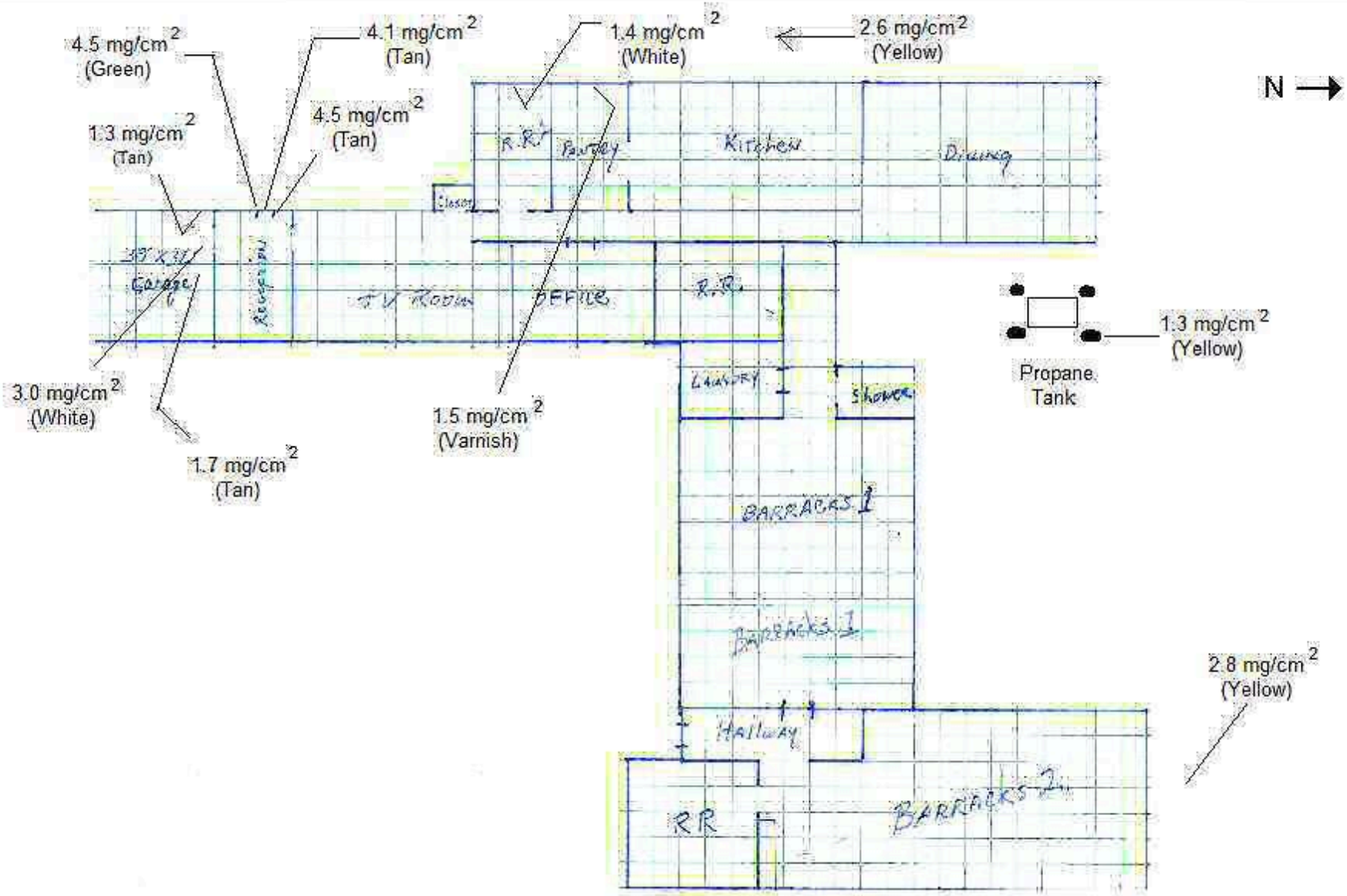
All sample numbers are preceded by ECG-14-2959

Vina Helitack Base 4520 Highway 99E Vina, CA 96092	Entek Consulting Group, Inc. 4200 Rocklin Road, Suite 7 Rocklin, California 95677 Map Not to Scale	Approximate Lead Bulk Sample Locations Collected by Jack DeLay on 1/16/14 Entek Project Number 14-2959

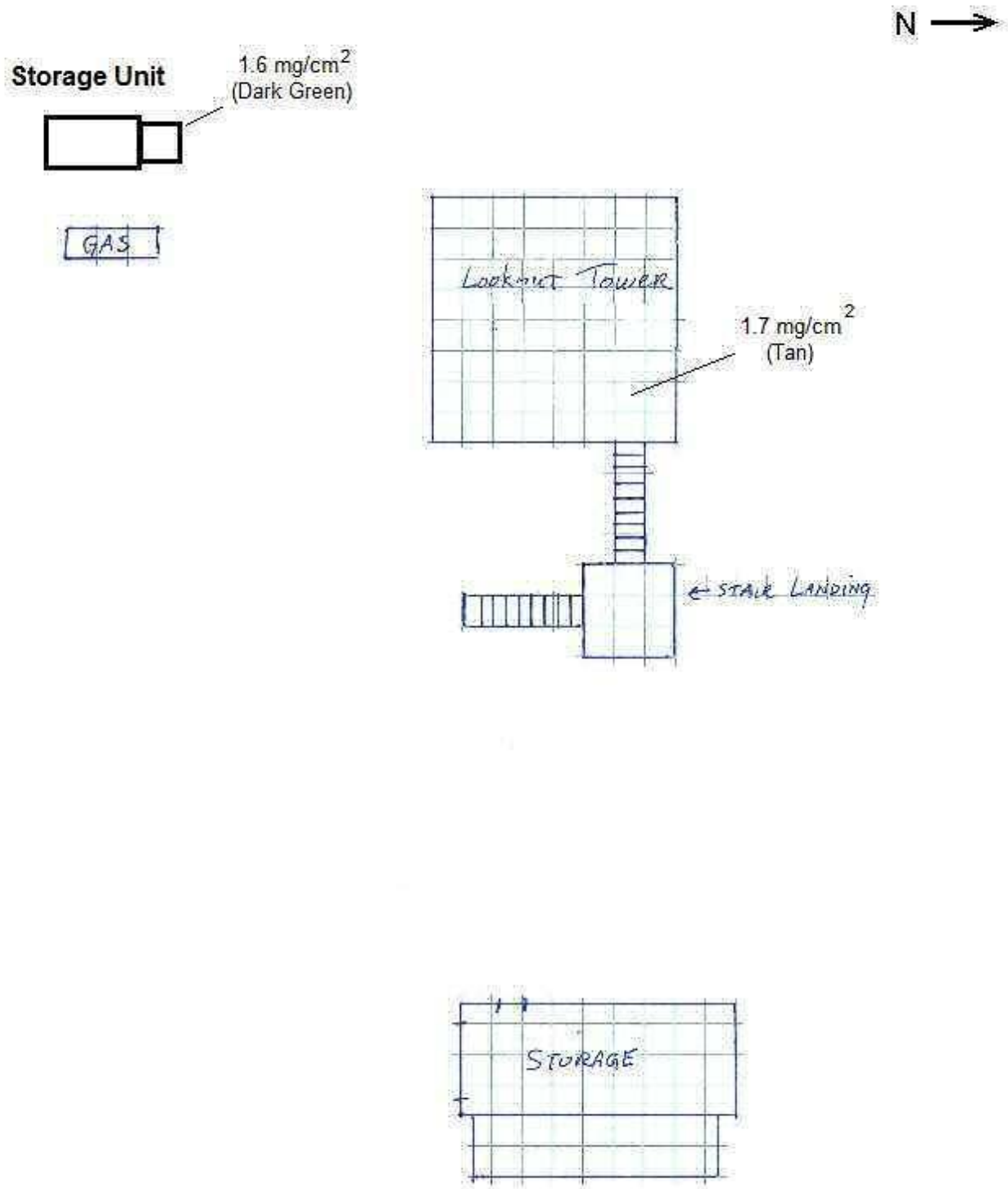


All Sample Numbers Are Preceded by ECG-14-2959-

Vina Helitack Base 4520 Highway 99E Vina, CA 96092	Entek Consulting Group, Inc. 4200 Rocklin Road, Suite 7 Rocklin, CA 95677 Map Not to Scale	Approximate Lead Bulk Sample Locations Collected by Jack DeLay on January 16, 2014 Entek Project Number 14-2959



Vina Helitack Base 4520 Highway 99E Vina, CA 96092	Entek Consulting Group, Inc. 4200 Rocklin Road, Suite 7 Rocklin, California 95677 Map Not to Scale	Approximate Positive XRF Testing Locations by Jack DeLay on January 16, 2014 Entek Project Number 14-2959



Vina Helitack Base 4520 Highway 99E Vina, CA 96092	Entek Consulting Group, Inc. 4200 Rocklin Road, Suite 7 Rocklin, CA 95677 Map Not to Scale	Approximate Positive XRF Testing Locations by Jack DeLay on January 16, 2014 Entek Project Number

LEAD HAZARD EVALUATION REPORT

Section 1 – Date of Lead Hazard Evaluation January 16, 2014

Section 2–Type of Lead Hazard Evaluation (Check one box only)

❒ Lead Inspection ❒ Risk Assessment ❒ Clearance Inspection ■ Other (specify) See Attached Letter dated Dec. 1, 2008

Section 3–Structure Where Lead Hazard Evaluation Was Conducted

Address [number, street, apartment (if applicable)]	City	County	Zip Code
4520 Highway 99E	Vina	Tehama	96092

Construction date (year) of structure	Type of structure (check one box only)
1962	❒ Multi-unit building ❒ School or daycare ❒ Single Family Dwelling ■ Other (specify) Cal Fire Helitack Base

Section 4–Owner of Structure (If business/agency, list contact person)

Name	Telephone Number
Cal Fire / Jeff Schori	(530) 528-5199

Address [number, street, apartment (if applicable)]	City	State	Zip Code
604 Antelope Blvd.	Red Bluff	California	96080

Section 5–Results of Lead Hazard Evaluation (Check all that apply)

❒ No lead-based paint detected. ■ Lead-based paint detected.

❒ No lead hazards detected. ❒ Lead hazards detected.

Section 6–Individual Conducting Lead Hazard Evaluation

Name	Telephone Number
Entek Consulting Group, Inc. - Jack DeLay	(916) 632-6800

Address [number, street, apartment (if applicable)]	City	State	Zip Code
4200 Rocklin Road, Suite 7	Rocklin	CA	95677

CDPH certification number	Signature	Date
6725	J DeLay	01-21-14

Name and CDPH certification number of any other individuals conducting sampling or testing (if applicable)

N/A

Section 7–Attachments

A. A foundation diagram or sketch of the structure indicating the specific locations of each lead hazard or presence of lead-based paint;

B. Each testing method, device, and sampling procedure used;

C. All data collected, including quality control data, laboratory results, indicating laboratory name, address, and phone number.

First copy and attachments retained by inspector

Second copy and attachments retained by owner

Third copy only (no attachments) mailed to:

California Department of Public Health
Childhood Lead Poisoning Prevention Branch Reports
850 Marina Bay Parkway, Building P. Third Floor
Richmond, CA 94804-6403
FAX: (510) 622-5656

APPENDIX G

Noise Assessment

Project:
CAL FIRE Vina Helitak Replace Facility Project
Noise Assessment

Tehama County, California
May 21, 2014

Job # 2013-208

Lead Agency:

Prepared for:

Attn: Chris Stabenfeldt

Prepared by:

j.c. brennan & associates, Inc.

Luke Saxelby, INCE Bd. Cert.
Board Certified, Institute of Noise Control Engineering

1287 High Street, Auburn, California 95603 * 530-823-0960 (p) * (530)823-0961 (f)

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APPENDICES

Appendix A – Acoustical Terminology

INTRODUCTION

The Proposed Project would be located in northern California adjacent to State Highway (Hwy) 99. The 7.4 acre site is approximately 25 miles southeast of the City of Red Bluff and 18 miles northwest of the City of Chico, near the unincorporated community of Vina in Tehama County.

The Proposed Project would involve the replacement and expansion of the existing CAL FIRE Vina Helitack Base complex. The Project would include the demolition and new construction of several elements. The improvements within the Project area would include the following:

- 22-bed barracks building,
- three-bay apparatus building,
- generator/pump/storage building,
- five-blade helicopter hangar (to occur at a later date but is included as a part of this environmental analysis)
- re-constructed primary helipad and a new secondary helipad,
- relocated helicopter fueling infrastructure,
- training tower apparatus, and,
- construction of a new southbound deceleration and acceleration lane, the reconstruction of the northbound lane configuration to accommodate the new lane on Hwy 99, new driveway approach apron, and new roadway drainage infrastructure.

In addition to the improvements described above, the Project would include the following additional components:

<u>On-site</u>

- Demolition of the existing barracks/administration building, demolition of the existing two-bay apparatus building, demolition of the existing storage building, demolition of the existing septic system. Demolition of perimeter and helicopter pad fence, , helicopter pad, misc pavements, and rock retaining wall. Remove fuel vault and demolish pad, remove jet fuel tank and pumps, demolish utilities propane tanks and service, and remove/demo one tree. Demolition of the existing helicopter hangar would occur at a later date but is included as part of this environmental analysis.
- Construction of new improvements consisting of site grading, paving for road and parking areas, water supply, storage and distribution systems, wastewater disposal systems, drainage systems, and erosion control measures.
- Construction of a new paved driveway/access way around the southern portion of the Project site.
- A new 60 foot long by 6 foot wide hose wash rack.

- Two new aboveground water storage tanks (10,000 gallon for domestic water use and 20,000 gallon for fire suppression) and concrete support slabs.

- Installations of a new +/-500 foot deep domestic water supply well, well support improvements to include a new water filtration system, and domestic and fire water distribution systems.

- Two new 1,000 gallon propane tanks, concrete support pads, and underground gas distribution system.

- A new 12,000 gallon aboveground jet fuel tank, concrete support slab, and a fuel dispensing system.

- A new 2,000 gallon self-contained aboveground fuel tank with dispensing stations and concrete support slab. Tanks would be internally divided to provide 1,000 gallon diesel and 500 gallon gasoline.

- A new standard septic system consisting of an approximately 600 foot leach field, a 1,500 gallon septic tank (minimum), and a 600 foot-6 inch gravity main.

- A new storm water collection system consisting of approximately 300 foot of a 12 inch underground storm drain; four drain inlets; 500 foot-6 inch drain connecting building downspouts; and surface water swales to existing drainage systems.

- A drain system for the new wash rack including trench drain, oil/water separator, and diverter valve to connect to the septic system.

- A new 30 foot tall radio tower and foundation.

- A new free standing wood and steel framed training tower, complete with steel stairway, non-slip deck, railings, and an aircraft fuselage.

- New site lighting throughout, including helipad lighting, approach slope indicator lighting system, flag pole, and road identification sign lighting.

- New site landscaping and irrigation system.

- New fire sprinkler system in the existing helicopter hangar building.

- New perimeter fencing: approximately 2,000 feet of 6 foot-tall chain link fencing;

- New automatic gate which controls access to the site.

- New flag pole with in-ground mounted light.

- New underground electrical and telephone distribution systems.

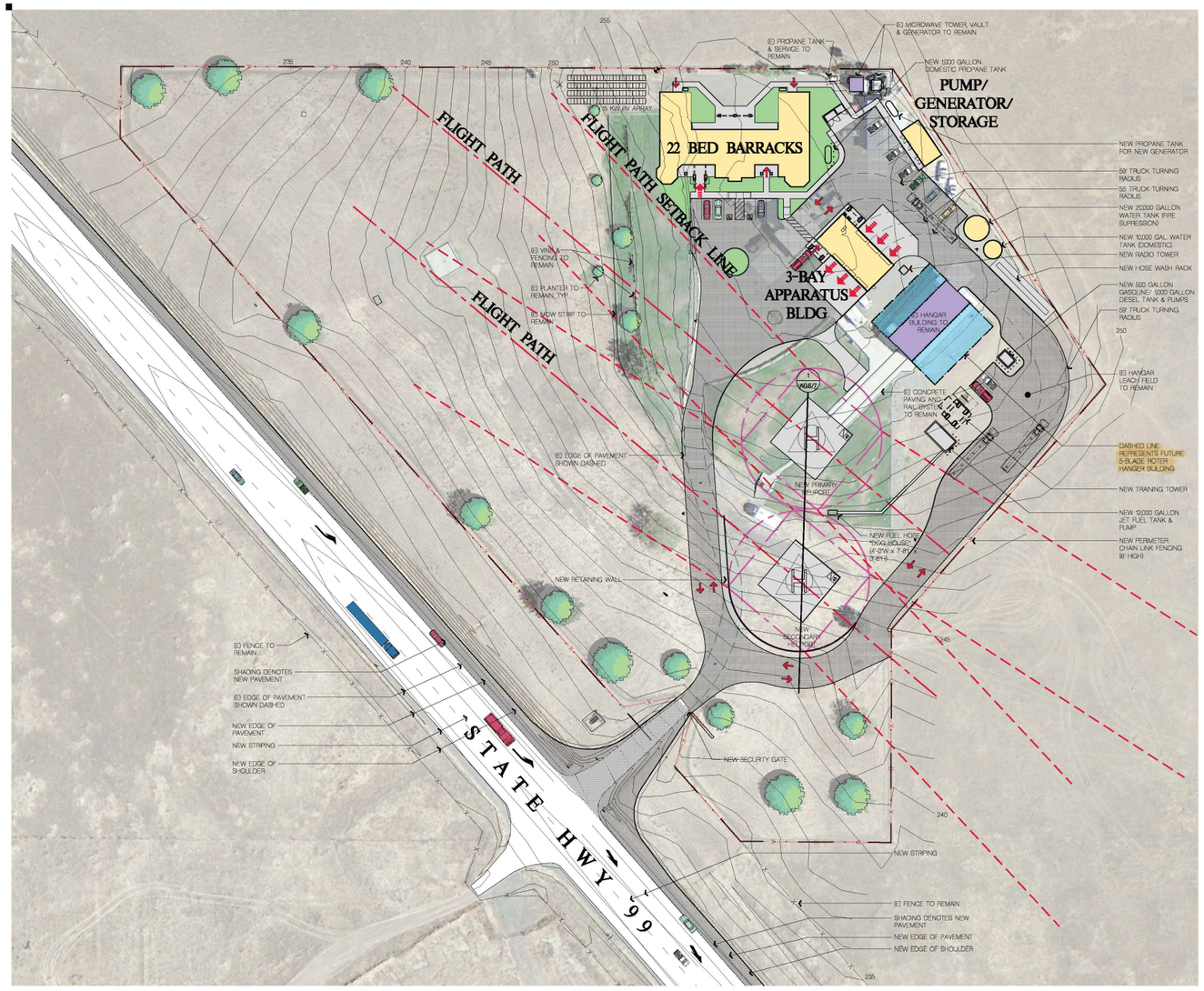
- New solar power system including photo-voltaic solar panels.

- New CAL FIRE station sign and platform.

Off-site

- Widening of Hwy 99 to allow for new left turn lane into Project site and a merging lane out of the Project site going south on Hwy 99. This would also involve the shifting of the existing north-bound travel lane requiring the need for additional pavement and a new gravel shoulder on the north-bound side of the roadway (east side of the existing roadway).

The purpose of this study is to examine the potential noise impacts associated with the Project at any existing noise-sensitive uses in the project vicinity. Figure 1 shows the project site plan.



PARKING ANALYSIS

TYPICAL PARKING STALL SIZE: 9'-6" x 18'-0", U.N.O.

NUMBER OF SPACES
25 SPACES

NUMBER OF ACCESSIBLE SPACES REQUIRED
PER CBC TABLE 11B-208.2
1 SPACE REQUIRED (1 VAN ACCESSIBLE)
2 SPACES PROVIDED (1 VAN ACCESSIBLE)

SITE DATA

SITE AREA = 320,370 S.F. (7.4 ACRES)

BUILDING AREA = 6,700 + 1999 + 648 +1992
11,339 TOTAL S.F.

FLOOR AREA RATIO = 11,339 S.F. / 320,370 S.F. = 0.04

LANDSCAPED AREA = SEE LANDSCAPE PLANS

LEGEND

NEW CONCRETE PAVING

NEW A.C. PAVING

EXISTING TREE TO REMAIN

PROPOSED SITE PLAN

SCALE: 1" = 40'-0"

0' 20' 40' 80' 160'

PROJECT NAME
VINA
HELITACK BASE
- REPLACE FACILITY
FOR

DGS
Department of General Services

4520 HIGHWAY 99E
VINA, CALIFORNIA 96092

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Sym.	Description	By	Date

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Checked By	KJM / LLM
Date Drawn	04/15/2014
Scale	1"=40'-0"
Job No.	13-6386.00

SHEET No.
A0.2

CAL FIRE Vina Helitack Replace Facility Project
Figure 1: Project Site Plan

j.c. brennan & associates
consultants in acoustics

Figure Prepared May 2014

Environmental Setting

Noise Background

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective. Often, someone's music is described as noise by another.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dBA. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dBA, and changes in levels (dBA) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels.

There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but may be expressed as dBA, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dBA apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, and shows very good correlation with community response to noise.

The day/night average level (L_{dn}) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise

environment. Table 1 lists several examples of maximum noise levels associated with common noise sources.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

Table 1: Typical Noise Levels		
Common Outdoor Activities	**Noise Level (dBA)**	**Common Indoor Activities**
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing
Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. November 2009.		

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dBA per doubling of distance from the source,

depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

A complete listing of acoustical terminology is provided in Appendix A.

Existing and Surrounding Land Uses

The Project site is designated by Tehama County within the *Valley Floor Agriculture* land use designation on the Tehama County General Plan Land Use Map and has a zoning designation of *A-2 (Agricultural/Valley District)*. The Project site abuts Hwy 99 to the west and un-developed pastureland/rangeland to the east, south and north. Existing orchard/agricultural uses are approximately ½ mile to the west and north of the Project site.

Highway 99, a two-lane regional State Highway, is located adjacent to the Project site on the west. The nearest residence is located approximately ½ mile to the southeast of the Project site on Tecate Road. Another residence is located approximately ¾ of a mile to the north. The nearest community is Vina, approximately 1.3 miles northwest of the Project. The nearest roadway intersection of significance is the intersection of Hwy 99 and South Avenue which is located approximately ¼ mile to the north.

REGULATORY FRAMEWORK

Federal

There are no federal regulations related to noise that apply to the Proposed Project.

State

The California Environmental Quality Act (CEQA) Guidelines, Appendix G, indicate that a significant noise impact may occur if a project exposes persons to noise levels in excess of local general plans or noise ordinance standards, or cause a substantial permanent or temporary increase in ambient noise levels.

State of California Public Utilities Code

The state legislative authority to adopt noise standards governing the operation of aircraft and aircraft engines for airports is provided in Section 21669, Article 3, Chapter 4, Part 1, Division 9 of the Public Utilities Code (PUC) (Aeronautics Law). The California Department of Transportation (Caltrans) Division of Aeronautics is the agency responsible for compliance with this PUC section.

The PUC differentiates emergency service helicopters from other aircraft by providing exemptions from local ordinances. Section 21662.4(a), Article 3, Chapter 4, Part 1, Division 9 of the PUC states the following concerning exemptions from the noise ordinances:

> Emergency aircraft flights for medical purposes by law enforcement, fire fighting, military, or other persons who provide emergency flights for medical purposes are exempt from local ordinances adopted by a city, county, or city and county, whether general law or chartered, that restricts flight departures and arrivals to

particular hours of the day or night, that restrict the departure or arrival of aircraft based upon the aircraft's noise level, or that restrict the operation of certain types of aircraft.

Caltrans Division of Aeronautics

The Caltrans Division of Aeronautics has adopted Community Noise Equivalent Level (CNEL) as the noise descriptor to be used in describing the noise impact boundary of California airports. The Division of Aeronautics has identified a CNEL value of 65 dB as the noise impact criterion for noise-sensitive land uses, such as single-family or multi-family dwellings. The CNEL is typically about 1 dB more than the L_{dn} because it applies an additional penalty for noise sources between the hours of 7:00 p.m. and 10:00 p.m. The L_{dn} descriptor only applies a penalty to noise levels between the hours of 10:00 p.m. and 7:00 a.m.

Tehama County General Plan

The 2008-2028 Tehama County General Plan contains policies regarding noise issues. Relevant County General Plan policies are summarized below.

Policy N-3.1: The interior and exterior noise level standards for noise-sensitive areas of new uses affected by traffic or railroad noise sources in Tehama County are depicted in Table 9.2 (Table 2 in this report).

Table 2: Noise Standards for New Uses by Traffic and Railroad Noise
Tehama County Noise Element Table 9.2

New Land Uses	Outdoor Activity Area – Ldn	Interior – Ldn/Peak Hour L_{eq}[1]	Notes
All Residential	60-65	45	2, 3, 4
Transient Lodging	65	45	5
Hospitals & Nursing Homes	60	45	6
Theaters & Auditoriums	---	35	
Churches, Meeting Halls, Schools, Libraries, etc.	60	40	
Office Buildings	65	45	7
Commercial Buildings	65	50	7
Playgrounds, Parks, etc.	70	---	
Industry	65	50	7

Notes:
1. For traffic noise within Tehama County, Ldn, and peak-hour L_{eq} values are estimated to be approximately similar. Interior noise level standards are applied within noise-sensitive areas of the various land uses, with windows and doors in the closed position.
2. Outdoor activity areas for single-family residential uses are defined as back yards. For large parcels or residences with no clearly defined outdoor activity area, the standard shall be applicable within a 100-foot radius of the residences.
3. For multi-family residential uses, the exterior noise level standard shall be applied at the common outdoor recreation area, such as at pools, play areas, or tennis courts.
4. Where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB Ldn may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.
5. Outdoor activity areas of transient lodging facilities include swimming pool and picnic areas.
6. Hospitals are often noise generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relation by either hospital staff or patients.
7. Only the exterior spaces of these uses designated for employee or customer relaxation have any degree of sensitivity to noise.

Source: Tehama County General Plan, 2009

Policy N-4.2: The interior and exterior noise level standards for noise-sensitive areas of new uses affected by non-transportation noise sources within Tehama County are depicted in Table 9.3 (Table 3 in this report).

Table 3: Noise Standards for New Uses Affected by Non-Transportation Noise
Tehama County Noise Element Table 9.3

New Land Use	Outdoor Activity Area – L_{eq}		Interior – L_{eq}	
	Daytime	Nighttime	Day & Night	Notes
All Residential	50	45	35	1, 2, 7
Transient Lodging	55	---	40	3
Hospitals & Nursing Homes	50	45	35	4
Theaters & Auditoriums	---	---	35	
Churches, Meeting Halls, Schools, Libraries, etc.	55	---	40	
Office Buildings	55	---	45	5, 6
Commercial Buildings	55	---	45	5, 6
Playgrounds, Parks, etc.	65	---	---	6
Industry	65	65	50	5

Notes:
1. Outdoor activity areas for single-family residential uses are defined as back yards. For large parcels or residences with no clearly defined outdoor activity area, the standard shall be applicable within a 100-foot radius of the residences.
2. For multi-family residential uses, the exterior noise level standard shall be applied at the common outdoor recreation area, such as at pools, play areas or tennis courts. Where such areas are not provided, the standards shall be applied at individual patios and balconies at the development.
3. Outdoor activity areas of transient lodging facilities including swimming pool and picnic areas, and are not commonly used during nighttime hours.
4. Hospitals are often noise generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.
5. Only the exterior spaces of these uses designated for employee or customer relaxation have any degree of sensitivity to noise.
6. The outdoor activity areas of office, commercial and park uses are not typically utilized during nighttime hours.
7. It may not be possible to achieve compliance with this standard at residential uses located immediately adjacent to lodging dock areas of commercial uses while trucks are unloading. The daytime and nighttime noise level standards applicable to loading docks shall be 55 and 50 dB L_{eq}, respectively.

General: The Table 9.3 standards shall be reduced by 5 dB for sounds consisting primarily of speech or music, and for recurring impulsive sounds.

If the existing ambient noise level exceeds the standards of Table 9.3, then the noise level standards shall be increased at 5 dB increments to encompass the ambient.

Source: Tehama County General Plan, 2009

Policy N-5.1: The County shall work to keep current and implement the noise policies in the "Impact of Airport Noise on Land Use" Table 9-4 (Figure 2 in this report).

Implementation Measure N-5.1a

Review all development proposals to ensure compliance with the TCACLUP. Compliance shall include:

a. Airport/Land Use noise compatibility shall be evaluated in terms of the Community Noise Equivalent Level (CNEL), as defined in Title 21 of the California Administration Code.

b. The maximum noise exposure that shall be considered normally acceptable for residential areas is 60 dBA CNEL.

c. The relative acceptability or unacceptability of particular land uses with respect to the noise levels to which they would be exposed as indicated in the "Impact of Airport Noise on Land Use Types" matrix. These criteria shall be the principal determinants of whether a proposed land use is compatible with the noise impact from a nearby airport, but special circumstances, which would affect the specific proposal's noise sensitivity (e.g., the extent or lack of outdoor activity), also shall be taken into account.

d. One of the conditions for approval of a land use which is "marginally acceptable" or "normally unacceptable" for the given noise environment is that the building must provide a satisfactory degree of noise attenuation (see Table 9-4, Land Use Acceptability Definitions, Figure 2 in this report). If the structure can reduce the noise exposure to the indicated level, the use may be acceptable. It should be noted that the interior noise criteria are measured in terms of maximum noise levels of individual events and not average noise levels as represented by CNEL values. Since maximum exterior individual even noise levels are greater than the CNEL value at a given location, the required noise reduction of the structure thus will be greater than the difference between the interior noise level criterion and the CNEL value.

e. In applying the interior noise level criteria, engine run-up noise shall be considered as a source of commonly occurring exterior noise.

f. When applying the noise compatibility criteria to a given location, the basis for evaluation shall be the maximum Community Noise Equivalent Level to which the location is or is forecast to be exposed.

g. If a noise analyses, including noise monitoring, is conducted for a particular location and the results indicate that the maximum CNEL will be less than shown herein, the lower exposure level may be used for the land use evaluation at the discretion of the Airport Land Use Commission.

TABLE 9-4
IMPACT OF AIRPORT NOISE ON LAND USE

Land Use Category	CNEL or LDN, dBA 1				
	50-55	55-60	60-65	65-70	70-75
Residential					
Single family detached and duplexes	+	0	♦	♦♦	♦♦
Multi-family and transient lodging	++	+	0	♦	♦
Mobile homes	+	♦	♦	♦♦	♦♦
Public					
School, libraries, hospitals, nursing homes	+	0	♦	♦	♦♦
Churches, auditoriums, concert halls	+	0	0	♦	♦♦
Transportation, parking, cemeteries	++	++	++	+	0
Commercial and Industrial					
Offices, retail	++	+	0	0	♦
Service commercial, wholesale trade warehousing light industrial	++	++	+	0	0
General manufacturing, utilities, extractive industry	++	++	++	+	+
Agricultural and Recreational					
Cropland	++	++	++	++	+
Livestock breeding	++	+	0	0	♦
Parks, playgrounds, zoos	++	+	+	0	0
Golf courses, riding stables, water recreation	++	++	+	0	0
Outdoor spectator sports	++	+	+	0	♦
Amphitheaters	+	0	♦	♦♦	♦♦

Land Use Acceptability	Interpretations Conditions
++ Clearly Acceptable	The activities associated with the specified land use can be carried out with essentially no interference from the noise exposure.
+ Normally Acceptable	Noise is a factor to be considered in that slight interference with outdoor activities may occur. Normal Construction methods will eliminate most noise intrusions upon indoor activities.
0 Marginally Acceptable	The indicated noise exposure will cause moderate interference with outdoor activities and indoor activities with windows open. This is acceptable upon the conditions that outdoor activities are minimal and construction features which provide for sufficient noise attenuation are used. Under other circumstances, the land use should be discouraged.
♦ Normally Unacceptable	Noise will create substantial interference with both outdoor and indoor activities. Noise intrusion upon indoor activities can be mitigated by requiring special noise insulation construction. Land uses which have conventionally constructed structures and/or involve outdoor activities which would be disrupted by noise should generally be avoided.
♦♦ Clearly Unacceptable	Unacceptable noise intrusion upon land use activities will occur. Adequate structural noise insulation is not practical under most circumstances. This land use should be avoided unless strong overriding factors prevail.

Figure 2: Tehama County General Plan Table 9-4

Determination of a Significant Increase in Noise Levels

California Environmental Quality Act (CEQA) guidelines define a significant impact of a project if it "increases substantially the ambient noise levels for adjoining areas."

Table 4 is based upon recommendations made in August 1992 by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been asserted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the L_{dn}.

Based upon the Table 4 criteria, an increase in the traffic noise level of 1.5 dB or more would be significant where the ambient noise level exceeds 65 dB L_{dn}. The rationale for the Table 4 criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause significant annoyance.

Table 4: Significance of Changes in Cumulative Noise Exposure

Ambient Noise Level Without Project, L_{dn} /CNEL	Increase Required for Significant Impact
<60 dBA	+5.0 dB or more
60-65 dBA	+3.0 dB or more
>65 dBA	+1.5 dB or more
Source: FICON, August 1992.	

Vibration Standards

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

Tehama County does not have specific policies pertaining to vibration levels associated with construction activities.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 5 indicates that the threshold for damage to structures ranges from 2 to 6 peak particle velocity in inches per second (in/sec p.p.v). One-half this minimum

threshold or 1 in/sec p.p.v. is considered a safe criterion that would protect against architectural or structural damage. The general threshold at which human annoyance could occur is noted as 0.1 in/sec p.p.v.

Table 5: Effects of Vibration on People and Buildings

Peak Particle Velocity		Human Reaction	Effect on Buildings
in./sec.	mm/sec.		
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage.

Source: Caltrans. Transportation Related Earthborne Vibrations. TAV-02-01-R9601 February 20, 2002.

Standards of Significance

CEQA Guidelines define a significant adverse impact on the environment as an impact that would:

a. Exposure of persons to or generation of noise levels in excess of standards established in the Butte County General Plan. Specifically, exterior noise levels exceeding 60 dB CNEL.

b. Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels. Specifically, a threshold of 0.1 in/sec p.p.v. is considered a safe criterion that would protect against architectural or structural damage and human annoyance.

b. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, as defined by the FICON criteria contained in Table 4.

c. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project, as defined by the FICON criteria contained in Table 4.

d. For a project located within an airport land use plan or, where such a plan has not be adopted, within two miles of a public airport or public use airport, where the project would expose people residing or working in the area to excessive noise levels.

e. For a project within the vicinity of a private airstrip, where the project would expose people residing or working in the project area to excessive noise levels.

PROJECT IMPACT NOISE ASSESSMENT

Construction Noise

During the construction phases of the project, noise from construction activities would add to the noise environment in the immediate project vicinity. Activities involved in construction would generate maximum noise levels, as indicated in Table 6, ranging from 78 to 85 dBA at a distance of 50 feet. Construction activities would be temporary in nature and are anticipated to occur during normal daytime working hours.

Noise would also be generated during the construction phase by increased truck traffic on area roadways. A significant project-generated noise source would be truck traffic associated with transport of heavy materials and equipment to and from construction sites. This noise increase would be of short duration, and would likely occur primarily during daytime hours.

Table 6: Construction Equipment Noise

Type of Equipment	Maximum Level, dBA at 50 feet
Backhoe	78
Compactor	83
Compactor	80
Dozer	82
Dump Truck	76
Excavator	81
Paver	85
Grader	85
Roller	80
Trencher	81

Source: *Roadway Construction Noise Model User's Guide*. Federal Highway Administration. FHWA-HEP-05-054. January 2006.

The nearest residential receptors are located approximately 2,400 feet south of the project site. At this distance construction activities are not predicted to cause any substantial increase in ambient noise or be a source of annoyance to residents. Therefore, no additional noise control measures would be required.

Construction Vibration Levels

Table 7 shows the typical vibration levels produced by various pieces of construction equipment.

Table 7: Typical Construction Equipment Vibration Levels

Type of Equipment	Peak Particle Velocity @ 25 feet (inches/second)	Peak Particle Velocity @ 50 feet (inches/second)	Peak Particle Velocity @ 100 feet (inches/second)
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/roller	0.210	0.074	0.026

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2006

The Table 7 data indicate that construction vibration levels anticipated for the project are less than the 0.1 in/sec criteria at distances of 50 feet. The nearest residential use is located approximately 2,400 feet from the project site. Therefore, construction vibrations are not predicted to cause damage to existing buildings or cause annoyance to sensitive receptors. Implementation of the proposed project would have a less than significant impact.

Helipad Noise Impact Assessment Methodology

The proposed project does not include increased helicopter operations. The proposed project includes replacement of the primary helipad and a new secondary helipad. This secondary pad will primarily be used to park aircraft, not to accommodate increased operations. Therefore, no substantial change in CNEL noise contours is expected to be associated with this project. However, in order to show the noise exposure associated with helicopter operations, CNEL noise contours were modeled for this project, as discussed below.

Noise levels associated with helicopter operations were determined using the Federal Aviation Administration (FAA) Integrated Noise Model (INM) Version 7.0. The INM has the ability to develop noise contours for both fixed-wing aircraft (airplanes) and helicopter operations. The INM has an extensive database for helicopter operations, and this analysis utilized the Bell 212 Huey (UH-1N) (CH-135) model helicopter. j.c. brennan & associates, Inc., utilized the INM to develop noise level contours for helicopter operations. The contours developed included CNEL contours for three different operating scenarios, as outlined below.

Scenario 1 – Typical Off-Season Operations

- 1-2 daily flights
- All operations typically within the daytime hours of (7:00 am to 10:00 pm)

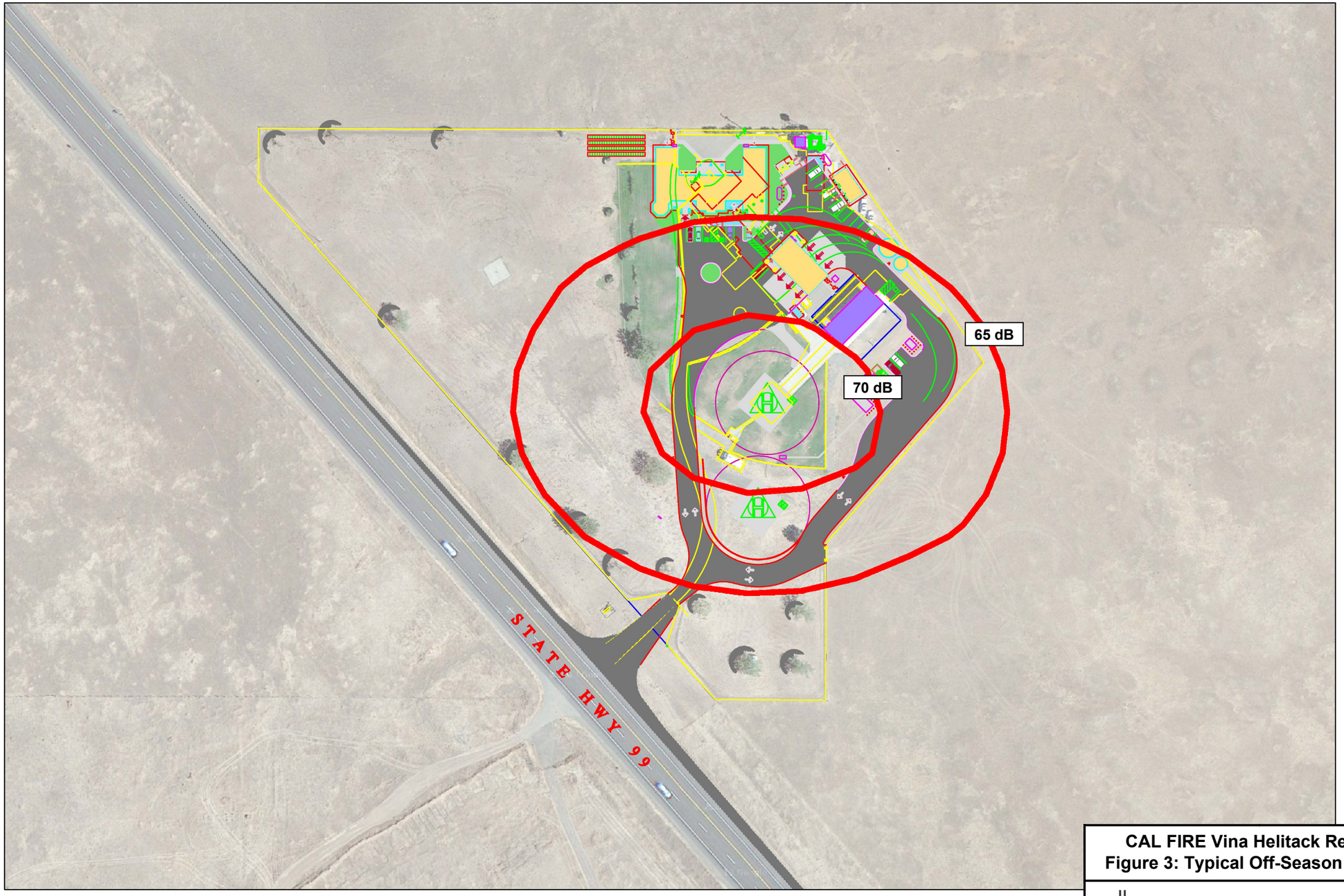
Scenario 2 – Typical Fire Season Operations

- 10-12 daily flights
- All operations typically within the daytime hours of (7:00 am to 10:00 pm)

Scenario 3 – Maximum Event Operations

- 30 daily flights
- All operations typically within the daytime hours of (7:00 am to 10:00 pm)

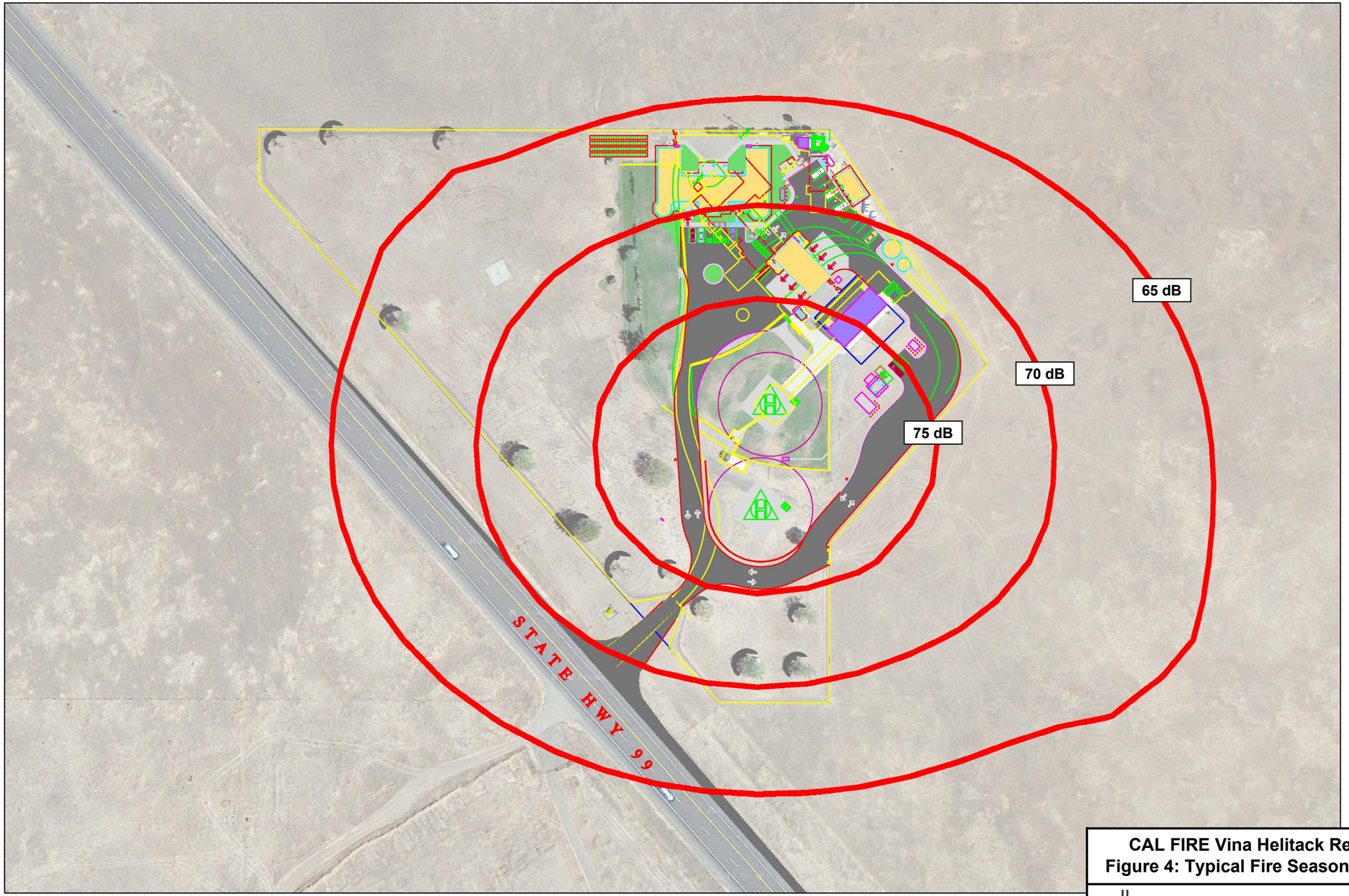
Figures 3-5 shows the predicted CNEL noise contours for each of the above-listed operating Scenarios. As indicated by Figures 3-5, the 65 dB CNEL noise contour would not extend to any sensitive residential areas. Additionally, because the proposed project will not change the number of overall operations, there is no substantial change in overall noise levels due to the proposed project. This would be a less-than-significant impact.



CAL FIRE Vina Helitack Replace Facility Project
Figure 3: Typical Off-Season Noise Contours (CNEL)

j.c. brennan & associates
consultants in acoustics

Figure Prepared May 2014



CAL FIRE Vina Helitack Replace Facility Project
Figure 4: Typical Fire Season Noise Contours (CNEL)

j.c. brennan & associates
consultants in acoustics

Figure Prepared May 2014

CAL FIRE Vina Helitack Replace Facility Project
Figure 5: Maximum Event Noise Contours (CNEL)

j.c. brennan & associates
consultants in acoustics

Figure Prepared May 2014

Traffic Noise Levels

The proposed project will not contribute to a substantial increase in traffic noise levels on the adjacent project roadways. Highway 99 at the project site carries approximately 6,600 vehicles per day (Caltrans ADT Traffic Volumes Book, 2012). The project would have to contribute more than 3,000 vehicles per day to cause an increase of 1.5 dB in traffic noise from Highway 99. The project's contribution to traffic on Highway 99 would be substantially less than 2,700 vehicles per day. Therefore, the proposed project is not predicted to substantially increase traffic noise levels.

NOISE REDUCTION MEASURES

No noise control measures are recommended for this project.

Appendix A
Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz).
L_{dn}	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
L_{max}	The highest root-mean-square (RMS) sound level measured over a given period of time.
$L_{(n)}$	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L_{50} is the sound level exceeded 50% of the time during the one hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
NRC	Noise Reduction Coefficient. NRC is a single-number rating of the sound-absorption of a material equal to the arithmetic mean of the sound-absorption coefficients in the 250, 500, 1000, and 2,000 Hz octave frequency bands rounded to the nearest multiple of 0.05. It is a representation of the amount of sound energy absorbed upon striking a particular surface. An NRC of 0 indicates perfect reflection; an NRC of 1 indicates perfect absorption.
Peak Noise	The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the “Maximum” level, which is the highest RMS level.
RT_{60}	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 Sabin.
SEL	Sound Exposure Level. SEL is s rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event.
STC	Sound Transmission Class. STC is an integer rating of how well a building partition attenuates airborne sound. It is widely used to rate interior partitions, ceilings/floors, doors, windows and exterior wall configurations.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

APPENDIX H

Traffic Assessment Memo

M E M O

To: Chris Stabenfeldt, ECORP Consulting Inc.

From: Ken Anderson, KD Anderson & Associates, Inc.

Date: May 20, 2014

Re: Traffic Assessment For The CDF Vina Helitack Base Facility Replacement Project, Tehama County, CA

This letter summarizes our focused traffic impact assessment for the CDF Vina Helitack Base Replacement Project (#2013-112).

Overview. The CAL FIRE Vina Helitack base exists today along SR 99 near the unincorporated Tehama County community of Vina roughly four miles north of Butte County line. The objective of the project is to replace the existing facility with a new modern helitack facility, a 22 bed barracks building, three-bay apparatus building and other ancillary facilities, and improvements to the site's SR 99 access including a new southbound left turn lane and southbound receiving / merge lane.

Project Characteristics

The characteristics of the project have been identified in terms of activities associated with construction and with regular operation, as well as the new improvements that will be constructed for circulation / access.

The project will be constructed over a year to 1½ year period. 10 to 20 construction employees are expected on the site at various times. Typical construction equipment associated with the building trades would be transported to the site at various times depending on the nature of construction occurring at any time. Various pieces of road construction equipment would be employed to construct improvements to SR 99, and materials for roadway construction would be transported to the site via SR 99 from aggregate sources and asphalt batch plants. On a daily basis, construction could generate 20 to 40 vehicle trips per day, with most of that activity concentrated into the beginning and ending of the work day.

Traffic to and from the site would also occur on a regular basis when the project is in operation, and the amount of traffic will vary seasonally. During the non-peak fire season the typical daily facility crew is four persons. This total increases to ten persons during the peak fire season, and during a maximum fire event staffing could include 20 overnight personnel and 40 day-time personnel.

On average, the Vina station responds to over 170 incidents a year, with a typical peak season period generating 20 to 30 fire event responses per month. These events may involve all of or a portion of the equipment and resources at the facility. During the non-fire season responses drop significantly to approximately one fire and one rescue/medical aid per month. In addition to responding to emergency calls, the facility is open to the public for the purposes of obtaining burn permits, tag and license validations and providing public information.

KDA

The amount of traffic regularly occurring to and from the site may be slightly greater with the project than that already being generated by the current operation. However any increase would be minor in relation to the overall traffic volume on SR 99. While additional barracks are being provided, employees assigned to the site would not be commuting on a daily basis. While proportionately more equipment may be dispatched over the course of the season, any increase would be spread throughout the day and would not be expected to be concentrated in peak periods of background traffic.

The project will make use of the existing Vina station access driveway on SR 99 but will make improvements to promote safety and capacity. The existing access is 20 feet wide and does not include features to accommodate the turning movements of vehicles into and out of the site. The project will include improvements designed to the satisfaction of Caltrans District 2, including:

1 a 305 foot long southbound left turn lane preceded by a 120 foot long bay taper;
2 a 150 foot long southbound receiving lane followed by a 715 foot long transition area.
3 Pavement widening along the east side of SR 99 for roughly 2,200 feet to relocate the northbound travel lane as needed to accommodate the southbound turn lane, and
4 Large radius returns to accommodate truck turns into and out of the site.

Environmental Setting

Existing Roadway Network. The project would be constructed on the Vina CAL FIRE site adjoining SR 99, and both regional and direct access to the site is provided by SR 99. SR 99 links the facility with Red Bluff to the north and with the Chico area to the south. South Avenue intersects SR 49 roughly 0.4 mile north of site and connects the facility with Interstate 5.

***State Route 99 (SR 99)*.** State Route 99 is an important north-south route in Tehama County, and SR 99 links the county to Shasta County to the north and Butte County to the south. SR 49 is part of the Inter-regional Roadway System. In the vicinity of the proposed project SR 99 is a two lane expressway with auxiliary two-way left turn lanes or left turn lanes at major intersections. The posted speed limit on SR 99 is 65 mph in the area of the project.

Caltrans provides *Annual Average Daily Traffic* (AADT) counts for SR 99, and the most recent daily traffic volumes on SR 99 are 11,200 AADT at the Butte County line and 10,805 south of South Avenue. Caltrans data indicates that trucks comprise 8% to 9% of the daily traffic on SR 99 in the study area.

The *SR 99 Transportation Concept Report (TCR) July 2009* is a general guide to the long range plan for improving the state highway. The TCR identifies three alternative visions for long term improvements to SR 99 north of the Butte County line:

1. Improvements on the existing alignment
2. South Avenue alignment
3. New alignment to I-5

Each vision would yield a four lane facility.

KDA

South Avenue. South Avenue is an east-west route that links SR 99 north of the project with Interstate 5 in Corning. South Avenue is a two lane facility classified as an arterial in the Tehama County General Plan. The General Plan Update EIR indicates that South Avenue carried 6,472 vehicles per day.

Traffic Impact Analysis Methodology. Qualitative Level of Service (LOS) analysis was performed for the study area circulation system access based on published information originally derived from the methodologies contained in the *Highway Capacity Manual (HCM).* LOS analysis is used to identify the relative delay experienced by motorists traveling on two lane rural highways. A grading scale of LOS "A" to LOS "F" is used to describe the quality of traffic flow, with LOS A representing uncongested operations and LOS F representing stop-and-go operation with appreciable congestion and delay.

Existing Traffic Operations. Information regarding current traffic operations has been obtained from available documents. As noted in Table 1, the SR 99 TCR indicates that the state highway operates at LOS C in both directions in the vicinity of the project. The Tehama County General Plan Update EIR indicates that South Avenue operates at LOS B.

Regulatory Background

California Department of Transportation (Caltrans)

Caltrans has jurisdiction over SR 99 and the balance of the state highway system. According to the Caltrans' *Guide for the Preparation of Traffic Impact Studies* (Caltrans, 2002), Caltrans aims to maintain a target Level of Service (LOS) at the transition between C and D on state highway facilities. However, Caltrans acknowledges that this may not always be feasible and recommends that the Lead Agency consult with Caltrans to determine the appropriate target LOS. If an existing state highway facility is operating below the appropriate target LOS, the existing LOS should be maintained.

Caltrans' *Transportation Concept Report for State Route 99* (SR 99 TCR; California Department of Transportation District 2, 2009) identifies long-range improvements and establishes the concept (desired) LOS for specific corridor segments. The report identifies long-range improvements needed to bring an existing facility up to expected standards needed to adequately serve 20-year traffic forecasts. Additionally, it identifies the ultimate design concept for conditions beyond the immediate 20-year design period. The SR 99 TCR establishes LOS C as the acceptable planning threshold for SR 99 in Tehama County from the Butte County line to South Avenue.

The Caltrans *Highway Design Manual (HDM)* provides guidance in the design of facilities on state highways. In this case, Chapter 4 identifies design requirements for intersections and turn lanes based on deceleration requirements and acceptable transitions from mainline highway alignment. Satisfaction of HDM requirements would be criteria in evaluating the adequacy of proposed improvements.

Tehama County

The Circulation Element of the *2008-2028 Tehama County General Plan* (Tehama County, 9/2008) provides policy direction for the transportation systems that serve the unincorporated lands of Tehama County and describes how the County intends to serve transportation needs for the next 20 years.

According to Policy Cir-1.1, Level of Service D is the minimum standard during peak hours and LOS C is the minimum standard during non-peak hours.

Tehama County Transportation Commission
The Tehama County 2006 Regional Transportation Plan (RTP) provides a coordinated, 20-year vision of the regionally significant transportation improvements and policies needed to efficiently move goods and people in the region. As the Regional Transportation Planning Agency (RTPA), the Tehama County Transportation Commission (TCTC) is required by California law to adopt and submit an approved RTP to the California Transportation Commission (CTC) every five years. The California Department of Transportation (Caltrans) assists with plan preparation and reviews draft documents for compliance and consistency. The 2006 RTP does not include specific policy regarding minimum Level of Service.

Impact Assessment

Impact to Traffic Operations. Vehicular traffic accompanying the construction or operation of the project will not result in a significant traffic impact. Construction traffic would represent a small incremental addition to the current traffic volumes on SR 99 and South Avenue, and current Levels of Service would not be altered. Because conditions with the project would continue to satisfy the adopted minimum standards, the project's impact would not be significant

Short term traffic controls may be needed on SR 99 as the project's improvements to the state highway are constructed. Traffic controls may include traffic detours or lane closures which may delay motorists for short periods of time. Construction traffic controls would be included in a traffic handling plan as part of the documents included in the encroachment permit granted by Caltrans for work in the state right of way. Because construction traffic controls would be temporary and managed under a plan approved by Caltrans, these short term delays are not judged to be a significant impact.

Cumulative Impacts. The extent to which the proposed project may contribute to cumulative traffic impacts has been considered based on information contained in other documents. The reference materials cited earlier were reviewed to identify information relative to long term conditions on SR 99 and South Avenue.

Various sources suggest future traffic volumes on SR 99. The Tehama County General Plan Update EIR suggests the current AADT may increase to 15,477 vehicles per day by 2028. This volume is indicative of LOS F conditions. The 2006 RTP suggests that passing lanes would be a "shorter term" improvement needed in the area from South Avenue to the Butte County line to accommodate future demands. The same document suggests the route ultimately be widened to a four lane expressway, which is consistent with the 2009 TCR.

Available documents indicate that any project to widen SR 99 to four lanes would occur in the distant future (i.e., up to 50 years in the future). This work is neither funded nor programmed. Because the schedule for implementation is uncertain, Caltrans long range planning staff has indicated that accommodating future expressway widening as part of the Vina station project is not warranted and that the proposed improvements adequately address the project's cumulative impacts[1].

[1] Email from Scott White, California Department of Transportation to KDAnderson & Associates, 5/19/2014)

Information regarding future traffic volumes on South Avenue is less prevalent. The 2006 Tehama County General Plan EIR was accompanied by *Tehama County Daily Traffic Model Report, Omni-Means, 9/2006.* This document was the source of the SR 99 forecast cited above. The report figures suggested that the traffic volume on South Avenue may ultimately increase from the current 6,472 vehicles per day to more than 34,000 ADT. While this forecast may not be reasonable, it is an element of an overall General Plan EIR conclusion that traffic impacts to local and regional roadways were a significant and unavoidable impact.

Table 1
Level of Service Analysis

Facility	from	to	Jurisdiction	Existing		Cumulative	
				Daily Volume	Level of Service	Daily Volume	Level of Service
SR 99	South Avenue	Butte County line	Caltrans	11,200	C*	15,477**	F
South Avenue	Interstate 5	SR 99	Butte County	6,472	B*	34,312***	F

(*) source: 2006 SR 99 Transportation Concept Report
(**) source: Tehama County GP EIR
(***) source: Tehama County Daily Traffic Model Report, Omni-Means , ltd, September 2006

KDA