APPENDIX H

U.S. Army Corps of Engineers Permit, dated January 12, 2009, 2005-673 (includes July 1, 2008 U.S. Department of Interior Fish & Wildlife Service Biological Opinion)

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

January 12, 2009

Regulatory Division (2005-673)

Mr. Leonard Bandell
Madera Quarry, Inc.
P.O. Box 994248
Redding, California 96099-4248

Dear Mr. Bandell:

We are enclosing your copy of Department of the Army Permit 2005-673. Please note you are only authorized to complete the work described in the permit.

If you sell the property associated with this permit, the terms and conditions of this permit will continue to be binding on the new owner. To validate the transfer of this permit, have the succeeding party sign the permit transfer section at the end of the permit and forward a copy to this office, along with their printed name, address, telephone number, and other contact information.

The time limit for completing the work is specified in General Condition 1. If the work will not be completed prior to that date, you may request a time extension. Your request for an extension must be received by this office for consideration at least 30 days before the time limit date.

We appreciate your feedback. At your earliest convenience, please complete our customer survey at *http://www.spk.usace.army.mil/customer_survey.html*. Your passcode is "conigliaro".

Please refer to identification number 2005-673 in any correspondence concerning this project. If you have any questions, please contact me at 1325 J Street, Room 1480, Sacramento, CA 95814, email *Kathleen.A.Dadey@usace.army.mil* or telephone 916-557-7253. You may also use our website: *www.spk.usace.army.mil/regulatory.html*.

Sincerely,

Kathleen A. Dadey, PhD
Chief, California South Branch

Enclosure

Copy Furnished without enclosure:

Ms. Susan Jones, Chief, San Joaquin Valley Branch, Endangered Species Division, U.S. Fish and Wildlife Service, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-3901

Mr. Dave Smith, Wetland Section Chief (W-8), United States Environmental Protection Agency, 75 Hawthorne Street, San Francisco, California 94105

Mr. Bill Loudermilk , Regional Manager, California Department of Fish and Game, Central Region, 1234 E. Shaw Avenue, Fresno, CA 93710

Mr. Bill Orme, Chief, Water Quality Certification Unit, California State Water Resources Control Board, 1001 I Street, Sacramento, California 95814-2828

Mr. W. Dale Harvey, Central Valley Regional Water Quality Control Board, 1685 E Street, Fresno, CA 93706

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY PERMIT

Permittee: Madera Quarry, Inc.

Permit Number: SPK-2005-673

Issuing Office: U.S. Army Engineer District, Sacramento
Corps of Engineers
1325 J Street, Room 1480
Sacramento, California 95814-2922

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below. A notice of appeal options is enclosed.

Project Description:

To to develop a new hardrock quarry on approximately 121 acres of the 540-acre Madera Ranch, including an aggregate processing facility, hot mix asphalt plant, administration complex, parking areas, a new on-site access road, and stockpile and processing areas. The proposed project also includes improvements to County Road 209 from north of its intersection with Hwy 41 to the new on-site access road.

Mining at the Madera Quarry is expected to continue for up to 50 years, through several phases. The initial phase would involve preliminary site clearing and spanning Hildreth Creek for a new access road. Prior to any mining activity, vegetation and topsoil would be removed in immediate work areas and placed in topsoil storage areas. Site clearing would occur sequentially with mine development.

The proposed project would impact 1.29 acres of waters of the U.S. (0.63 acres of seasonal wetlands and 0.66 acres or 5,433 linear feet of ephemeral/intermittent streams)

All work is to be completed in accordance with the attached plans.

Project Location:

Township 10N, Range 20E, Sections 4, 9, 16, 21, 28, and 33 (MDBM; USGS Little Table Mountain, California 7.5-Minute Quadrangle).

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2019. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

1. All terms and conditions of the Order for Technically-Conditioned Section 401 Water Quality Certification, dated July 17, 2008, are expressly incorporated as conditions of this permit.

2. This Corps permit does not authorize you to take an endangered species, in particular the, valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), California tiger salamander (*Ambystoma californiense*), San Joaquin kit fox (*Vulpes macrotis mutica*) or designated critical habitat. In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (e.g., an Endangered Species Act Section 10 permit, or a Biological Opinion under Endangered Species Act Section 7, with "incidental take" provisions with which you must comply). The enclosed Fish and Wildlife Service

Biological Opinion (Number 81420-2008-I-1550 dated July 1, 2008), contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the Biological Opinion. Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take of the attached Biological Opinion, which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with the incidental take statement in the Biological Opinion, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Corps permit. The Fish and Wildlife Service is the appropriate authority to determine compliance with the terms and conditions of its Biological Opinion, and with the Endangered Species Act. You must comply with all conditions of this Biological Opinion, including those ascribed to the Corps.

3. To mitigate for the loss of 1.29 acres of waters of the United States, You shall establish a conservation easement on a 132- acre on-site parcel, which contains 0.086 acre of perennial creek, 0.170 acre of swale, 0.081 acre of ponds, 0.322 acre of seasonal wetland, and a 0.009 acre seep. Additionally, you shall restore least 675 feet of the North Fork of Little Dry Creek in order to achieve the desired 1.55 acres (67,500 square feet) of mitigation. The restoration shall consist of planting riparian vegetation typical of Sierra Nevada foothill riparian habitats in three zones extending out 50 feet from either side of the center line of the creek along this segment. The long-term monitoring plan must be provided to this office prior to proceeding with any activity otherwise authorized by this permit. Restoration work shall follow the Mitigation and Monitoring Plan, Madera Ranch Quarry Project, Madera County, California, prepared by Live Oak Associates, Inc, September 8, 2008.

4. You shall design and construct the Hildreth Creek crossing to retain a natural substrate and to accommodate all reasonably foreseeable wildlife passage and expected high flows.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal projects.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data. The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant.

Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General Condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

MADERA QUARRY, INC.

Permittee

1/6/2009

Date

BY: LEONARD BANDELL, V.P

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Kathleen A. Dadey, PhD
Chief, California South Branch
(For the District Engineer)

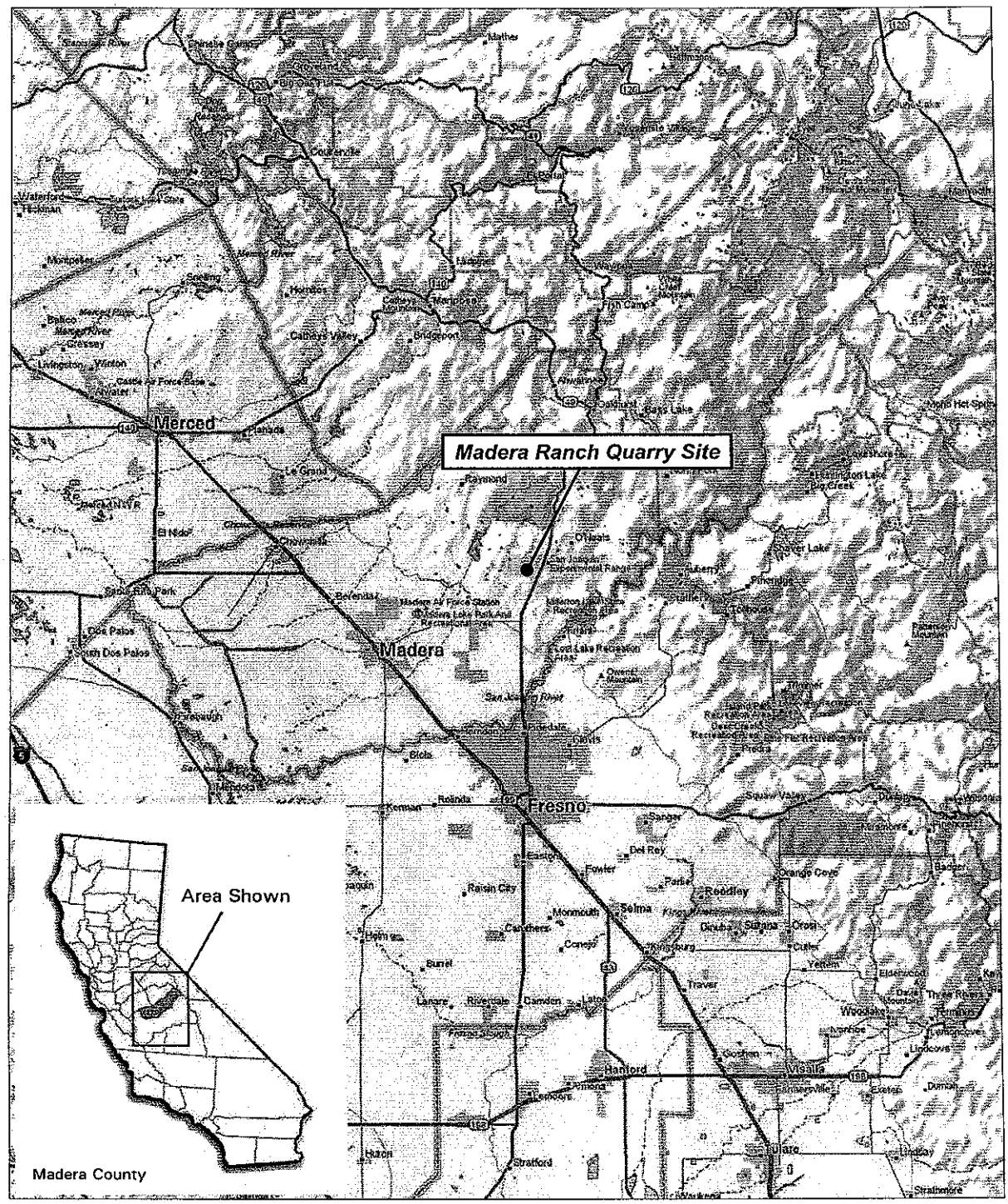
12 Jan 09

Date

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

Transferee

Date



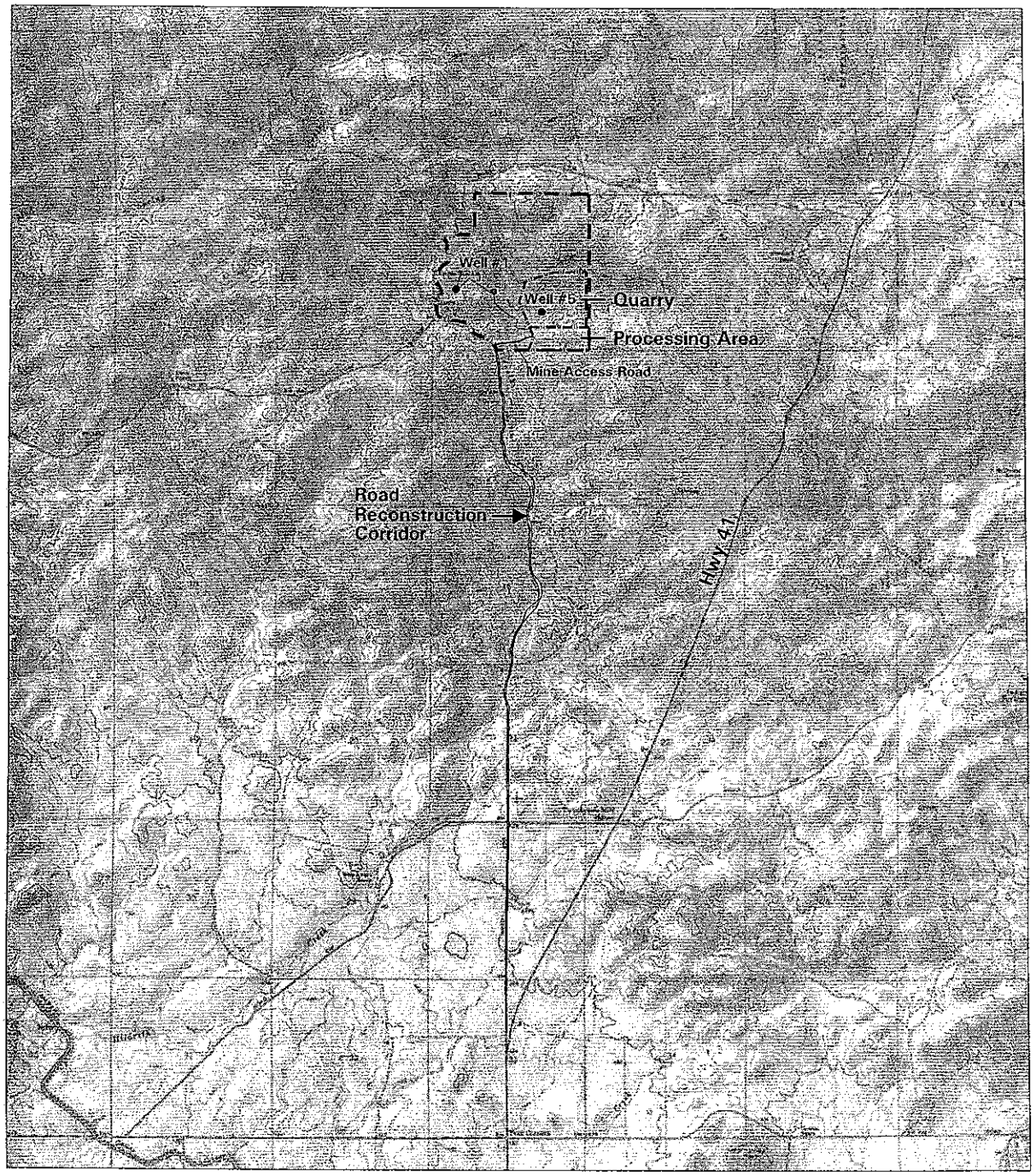
NORTH

0 15 Miles

SCALE: 1" = 15 Miles

Figure 1.0-1
Regional Location
MADERA RANCH QUARRY
MADERA COUNTY, CALIFORNIA

RESOURCE DESIGN TECHNOLOGY, INC.



T. 10 South, R. 20 East, Mt. Diablo B&M

LEGEND

- Madera Ranch Property Boundary
- Proposed Mining Operation/Access Road Limits
- Water Pipeline

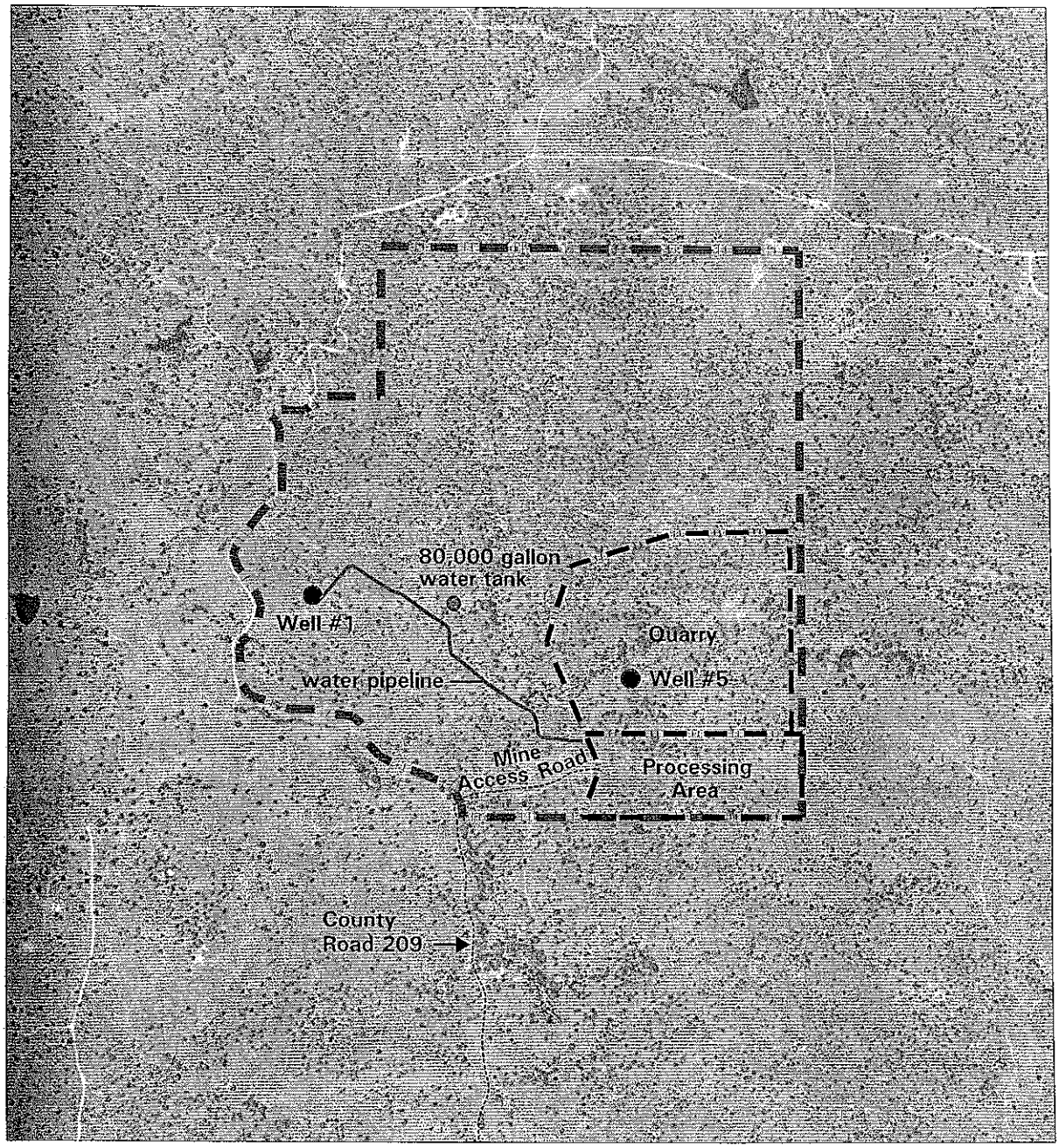
NORTH

0 1 Mile

SCALE: 1" = 1 Mile

Figure 2.0-1
Site Location
MADERA RANCH QUARRY
MADERA COUNTY, CALIFORNIA

RESOURCE DESIGN TECHNOLOGY, INC.



Photograph Source: I.K. Curtis, Date: December 2002

LEGEND

Property Boundary

Proposed Disturbance Limits

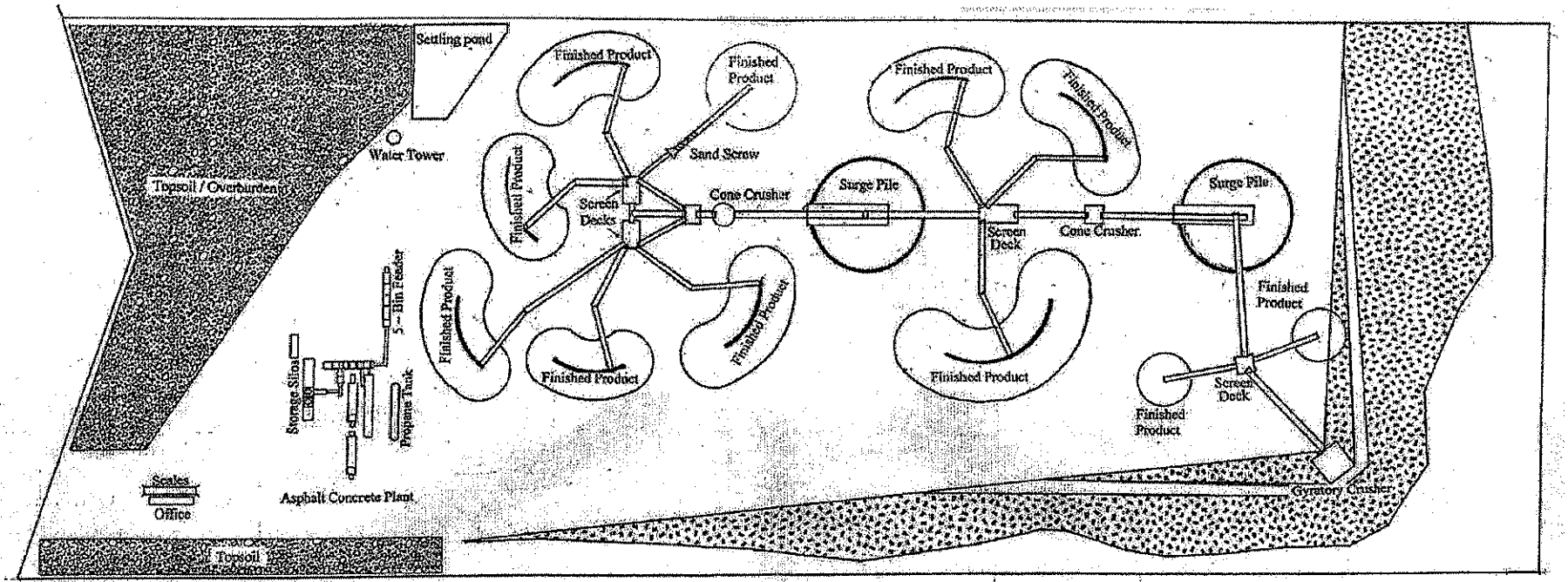
NORTH

0 1500'

SCALE: 1" = 1500'

Figure 2.0-2
Site Aerial Photograph with Major Project Components
MADERA RANCH QUARRY
MADERA COUNTY, CALIFORNIA

RESOURCE DESIGN TECHNOLOGY, INC.



Notes:
1. This information is conceptual and may change.
2. Topsoil and Overburden storage piles will be used as site & sound barrier.
3. Topsoil and Overburden piles will be kept separated and clearly labeled.
4. Stockpile locations may change within mine and plant sites during life of project

Source: DUANE K. MILLER - CIVIL ENGINEER INC.

NORTH

0 200'

SCALE

Figure 2.0-3
Madera Ranch Conceptual Plant Area Layout
MADERA RANCH QUARRY
MADERA COUNTY, CALIFORNIA

RESOURCE DESIGN TECHNOLOGY, INC.

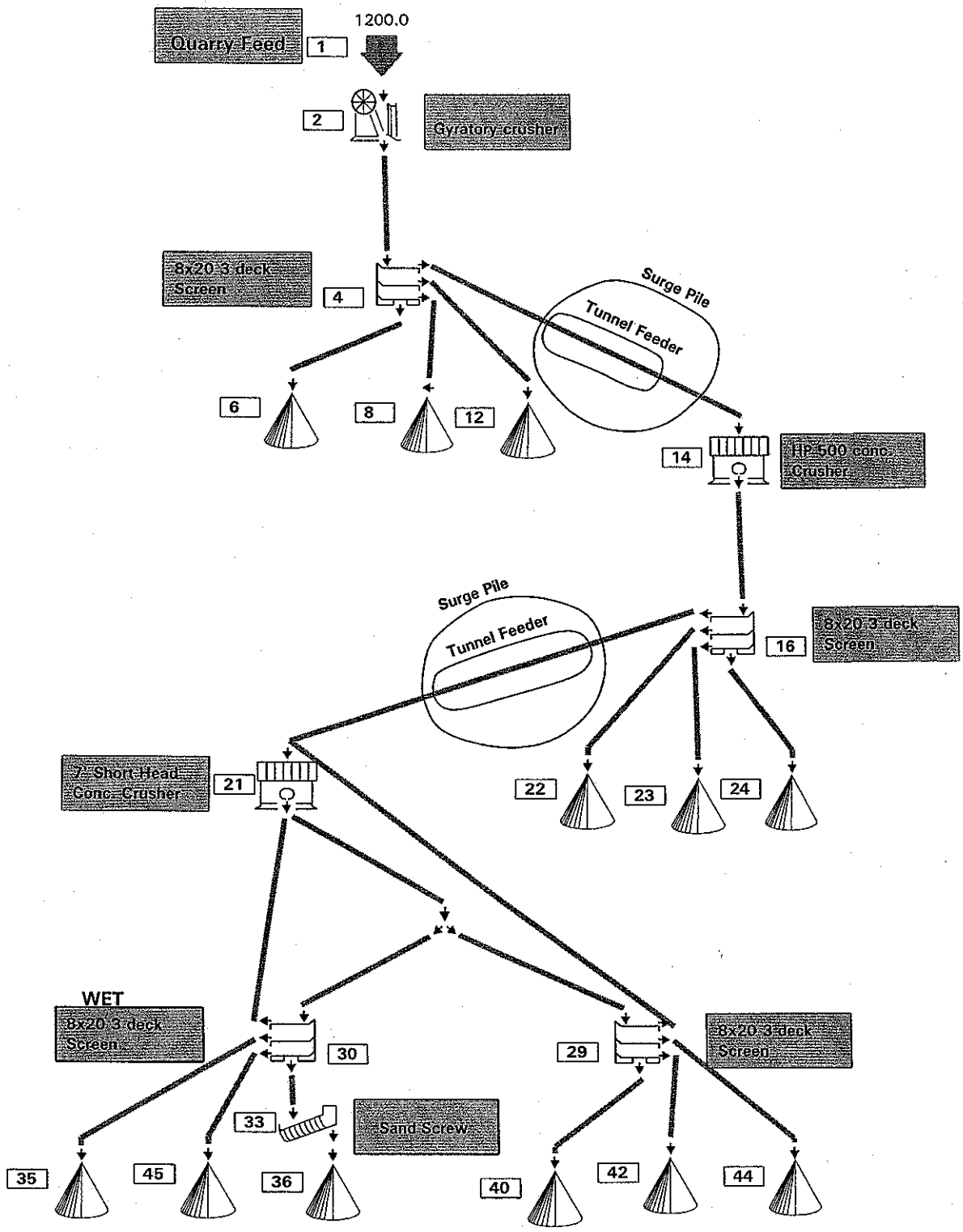
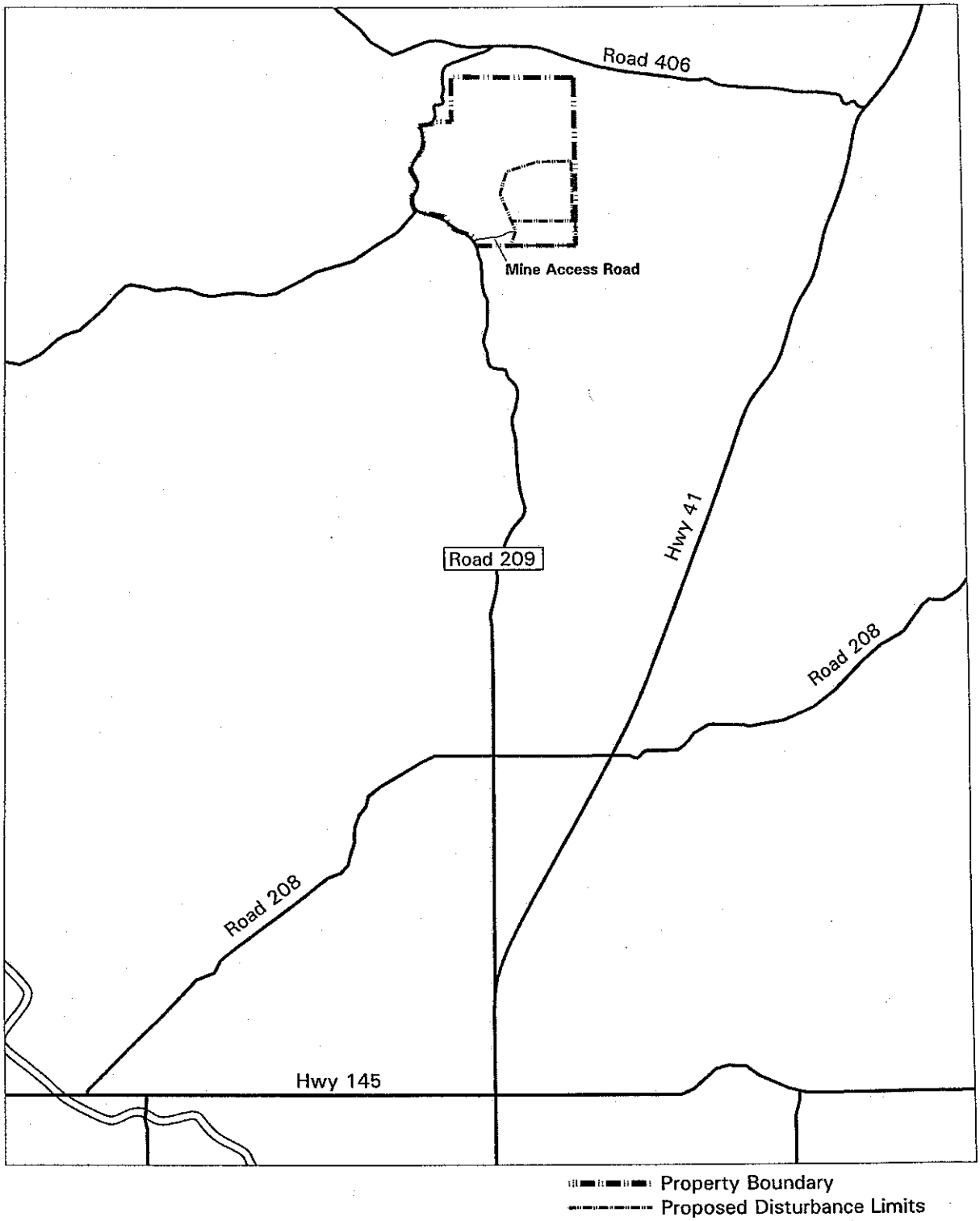


Figure 2.0-4
General Process Flow Diagram
MADERA RANCH QUARRY
MADERA COUNTY, CALIFORNIA

NO SCALE

RESOURCE DESIGN TECHNOLOGY, INC.



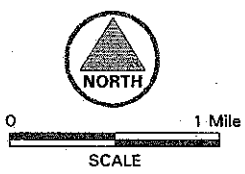
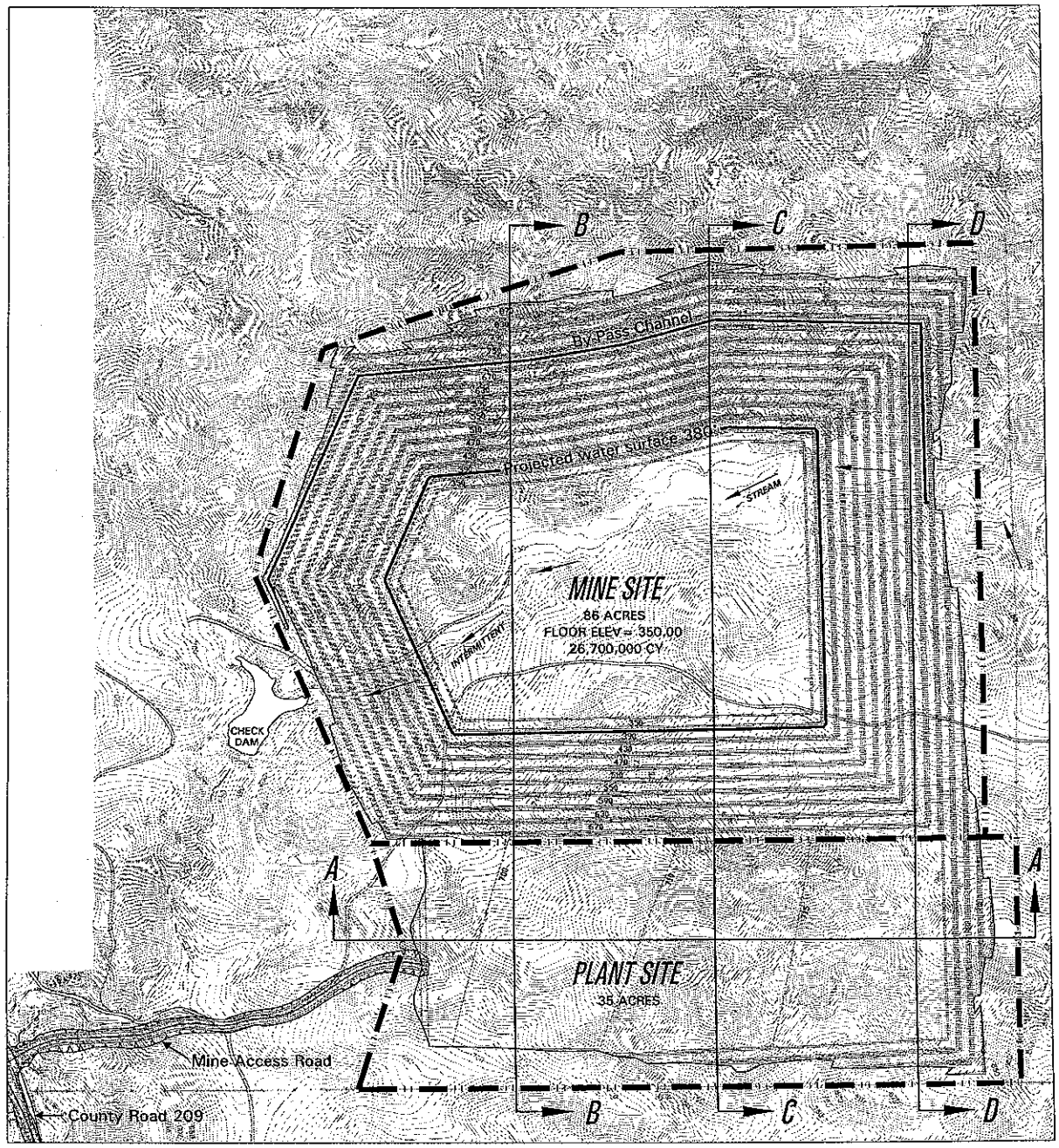


Figure 2.0-5
Regional Transportation Access
MADERA RANCH QUARRY
MADERA COUNTY, CALIFORNIA

RESOURCE DESIGN TECHNOLOGY, INC.



Topography Source: DUANE K. MILLER - CIVIL ENGINEER INC.

LEGEND

Proposed Disturbance Limits

Unpaved Roads

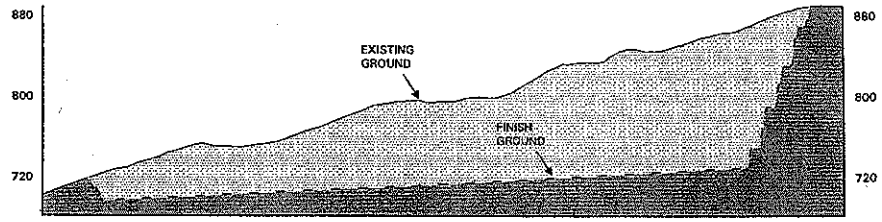
NORTH

0 500'

SCALE: 1" = 500'

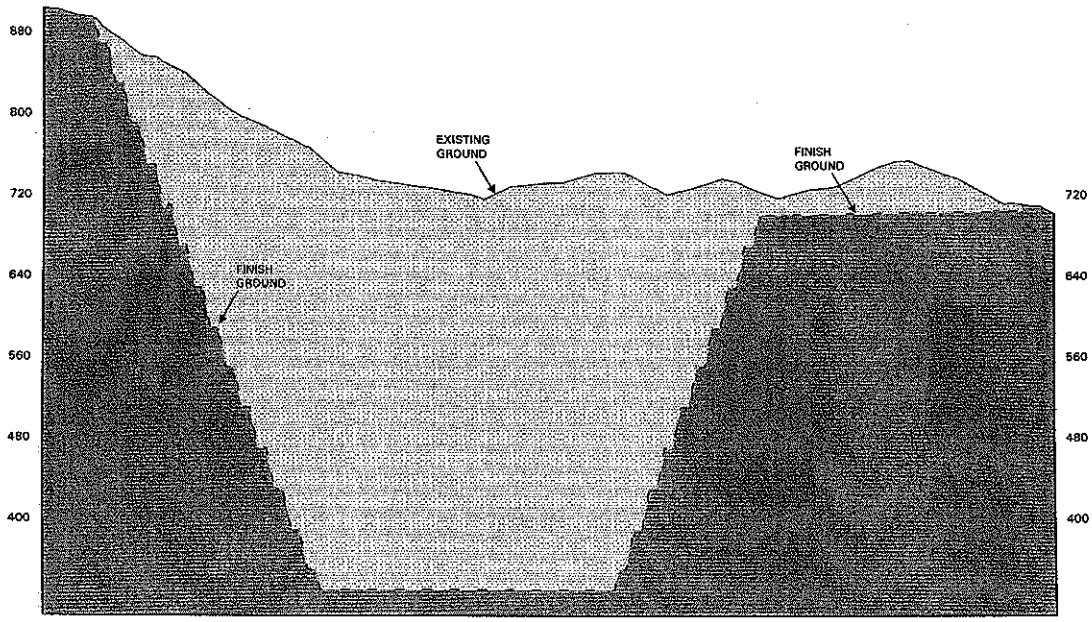
Figure 2.0-7
Mine Plan and Access Road
MADERA RANCH QUARRY
MADERA COUNTY, CALIFORNIA

RESOURCE DESIGN TECHNOLOGY, INC.



SECTION A-A

CROSS-SECTION SCALE:
HORIZONTAL 1" = 300'
VERTICAL 1" = 120'



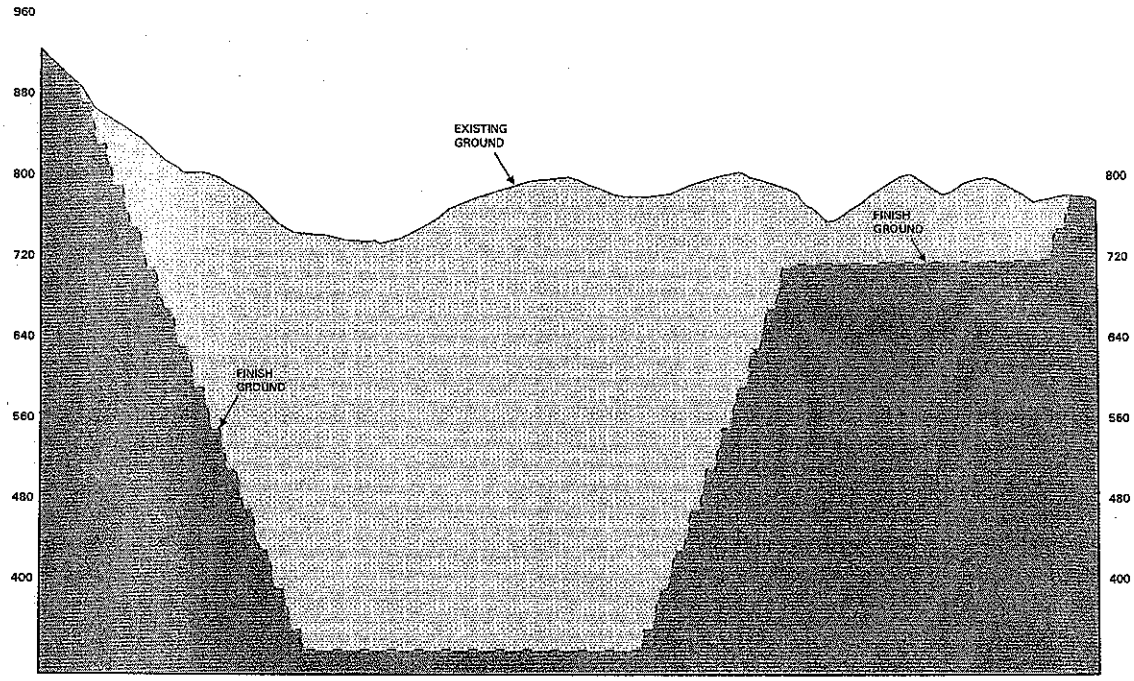
SECTION B-B

CROSS-SECTION SCALE:
HORIZONTAL 1" = 300'
VERTICAL 1" = 120'

Note: See Figure 2.0-7 for Cross-Section Locations
Source: DUANE K. MILLER - CIVIL ENGINEER INC

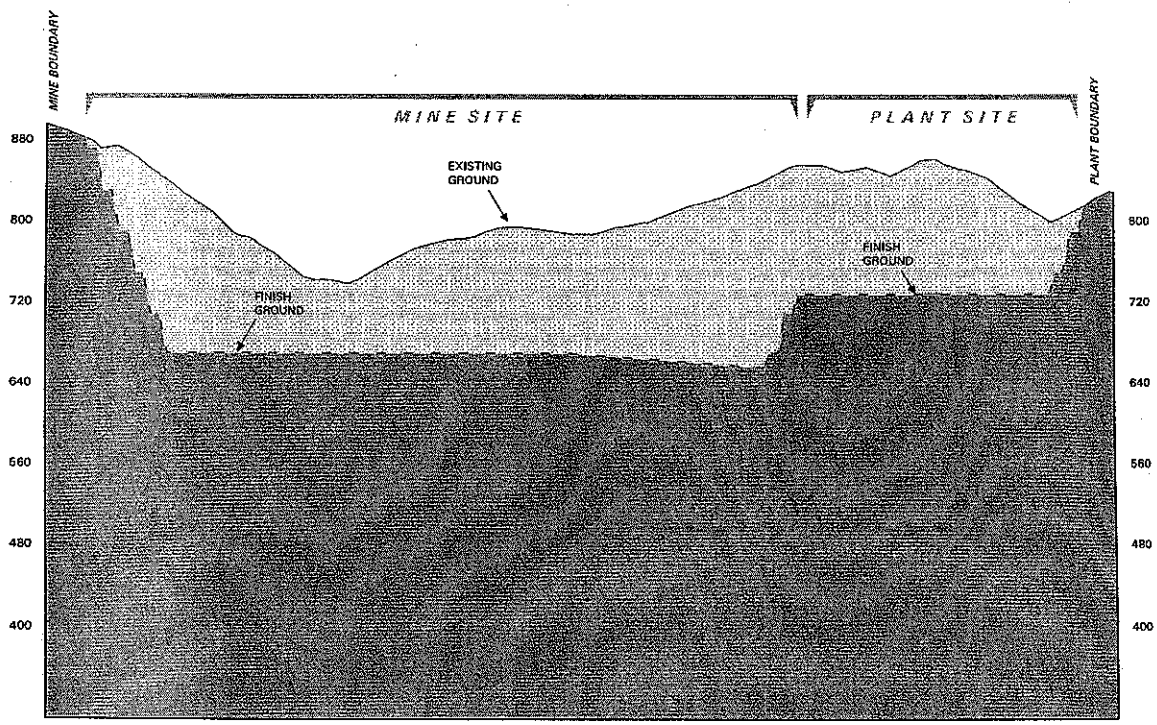
Figure 2.0-8
Mine Plan Cross-Sections A and B
MADERA RANCH QUARRY
MADERA COUNTY, CALIFORNIA

RESOURCE DESIGN TECHNOLOGY, INC.



SECTION C-C

CROSS-SECTION SCALE:
HORIZONTAL 1" = 300'
VERTICAL 1" = 120'



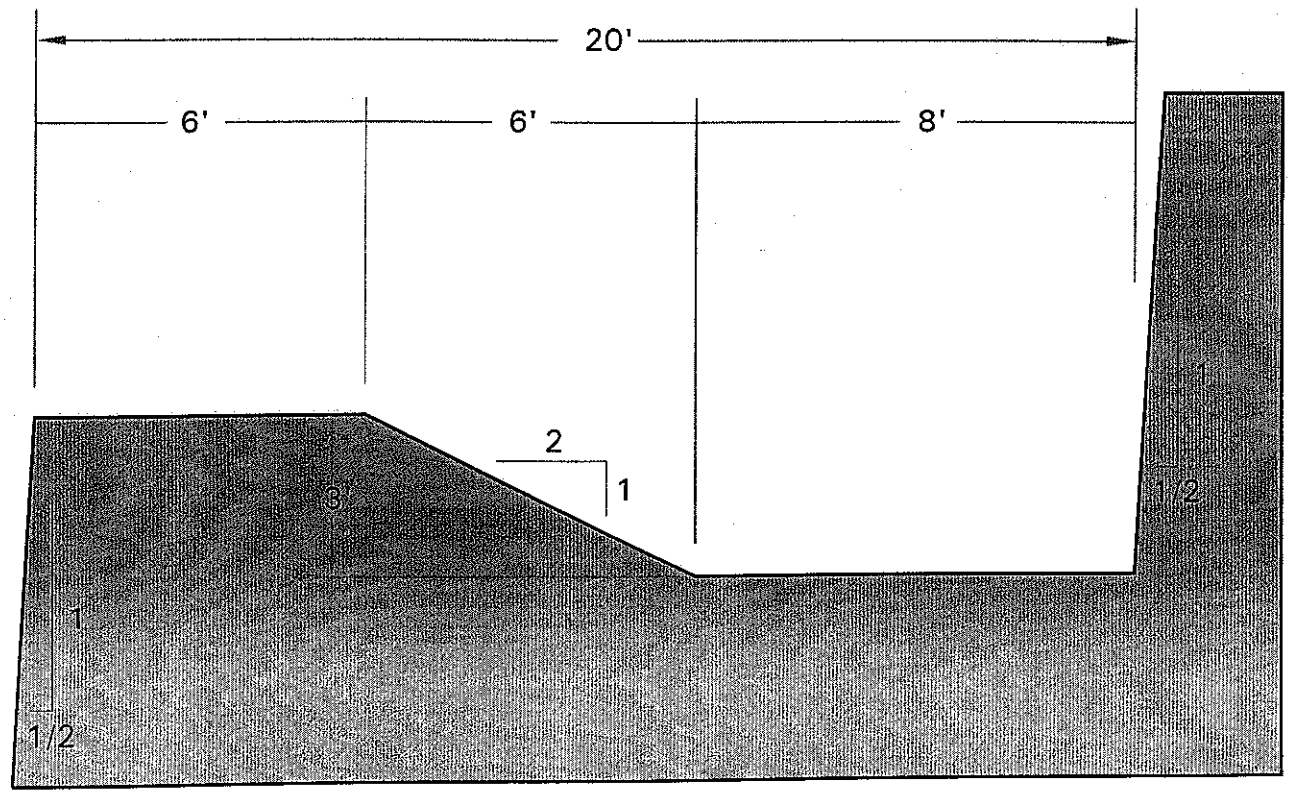
SECTION D-D

CROSS-SECTION SCALE:
HORIZONTAL 1" = 300'
VERTICAL 1" = 120'

Note: See Figure 2.0-7 for Cross-Section Locations
Source: DUANE K. MILLER - CIVIL ENGINEER INC.

Figure 2.0-9
Mine Plan Cross-Sections C and D
MADERA RANCH QUARRY
MADERA COUNTY, CALIFORNIA

RESOURCE DESIGN TECHNOLOGY, INC.

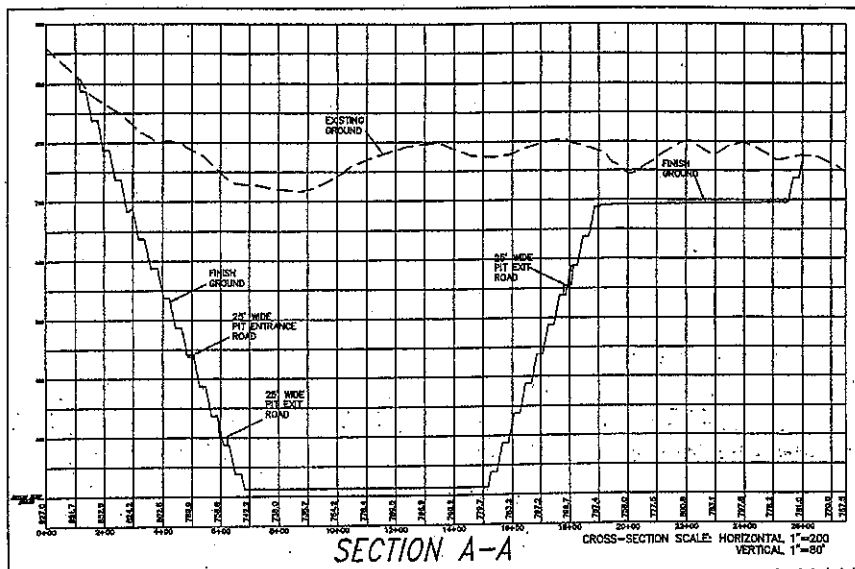


Source: DUANE K. MILLER - CIVIL ENGINEER INC.

Figure 2.0-10
Typical By-Pass Channel Section
MADERA RANCH QUARRY
MADERA COUNTY, CALIFORNIA

NO SCALE

RESOURCE DESIGN TECHNOLOGY, INC.



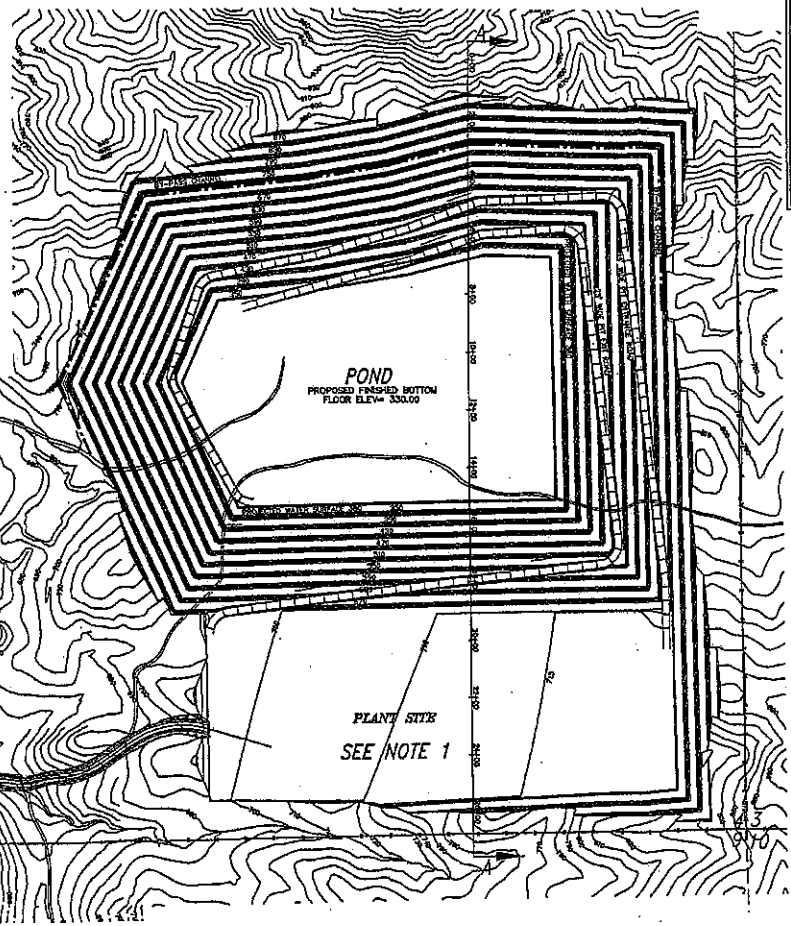
SECTION A-A

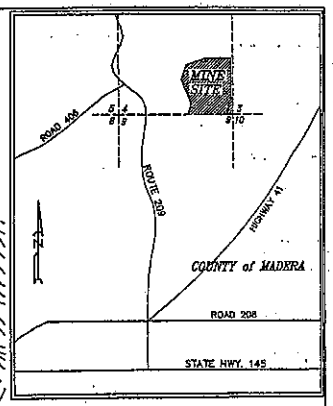
CROSS-SECTION SCALE: HORIZONTAL 1"=200'
VERTICAL 1"=80'

Site Volume Table Unadjusted

Site	Stratum Surf1	Surf2	Cut cuyds	Fill cuyds	Net cuyds	Method
FINAL-REC-PLAN	rec-plan	comp2	fg-6			
			35301811	44	35301767	Grid
			35314439	151	35314079	Composite
			35314165	100427	35213738	End area

TOTAL EXCAVATION: 35,300,000 CUBIC YARDS.



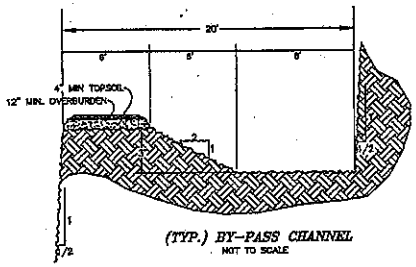


VICINITY MAP

LEGEND

BY-PASS CHANNEL

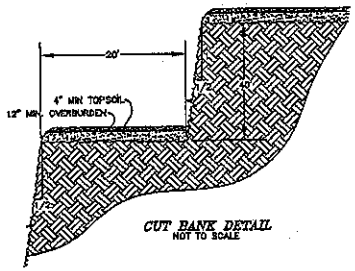
PROJECTED WATER SURFACE 380



(TYP.) BY-PASS CHANNEL
NOT TO SCALE

PLANT SITE
NOT TO SCALE

NOTE 1:
FINAL GRADE WILL BE ACHIEVED WITH PLACEMENT OF OVERBURDEN AND TOPSOIL. FINISHED SURFACE WILL BE REVEGETATED WITH NATIVE GRASSES PER RECLAMATION PLAN TEXT.



CUT BANK DETAIL
NOT TO SCALE

REVISIONS

NO.	DATE	DESCRIPTION	BY
1	11-10-04	ADD VOLUME CALCULATIONS	JB
2	1-06-06	ADD PLANT SITE DETAIL	JB

PLANS PREPARED UNDER THE SUPERVISION OF:
REGISTERED PROFESSIONAL ENGINEER
DUANE K. MILLER
No. 25490
EXP. 3-31-07
CIVIL
STATE OF CALIFORNIA

DUANE K. MILLER, CIVIL ENGINEER INC.
P.O. BOX 1307
ANDERSON, CALIFORNIA 96007
PH. (530) 365-5860
FAX (530) 365-6551

Figure 2.0-11
Madera Ranch Final Reclamation Plan
MADERA RANCH QUARRY
MADERA COUNTY, CALIFORNIA

County of Madera

MADERA RANCH

FINAL RECLAMATION PLAN

SUBMITTED BY: R.C.E. 25490 3-31-07
DUANE K. MILLER
CIVIL ENGINEER INC.

APPROVED BY:

DESIGN BY:

DRAWN BY: 1

DATE: NOV. 19, 2004

SCALE:

SHEET OF 1

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In reply refer to:
81420-2008-F-1550

JUL 01 2008

Ms. Kathleen "Kate" Dadey
Chief, California South Section
U.S. Army Corps of Engineers, Sacramento District
1325 J Street, Room 1480
Sacramento, California 95814-2922

Subject: Formal Consultation on the Proposed Madera Quarry, Inc., Mining Operation, Madera County, California (Corps File No. 200300748)

Dear Ms. Dadey:

This is in response to your request for formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed Madera Quarry, Inc. (MQI), mining operation (proposed project) located on Road 209, 16 miles northeast of the City of Madera, in Madera County, California. Your April 7, 2006, request for consultation on the proposed project was received in our office on April 10, 2006. This document represents the Service's biological opinion on the effects of the action on the federally-listed as threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (VELB), federally-listed as threatened California tiger salamander (*Ambystoma californiense*) (CTS), and federally-listed as endangered San Joaquin kit fox (*Vulpes macrotis mutica*) (SJKF). This document is issued in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

Information addressing VELB and CTS was provided in the *Biological Assessment - Madera Ranch Quarry Mining Operation* (PMC 2006; Pacific Municipal Consultants). The Biological Assessment provides data and analysis supporting the assertion that the proposed project is likely to adversely affect VELB. Furthermore, the Biological Assessment provides data and analysis supporting the assertion that a portion of the project (southern-most portion of Road 209 improvements) is likely to adversely affect CTS. The Service concurs with these determinations. However, the Service does not concur with the determination that CTS is unlikely to occur in other portions of the action area of the proposed project given the historic distribution of CTS in Madera County, presence of suitable habitat throughout the action area (e.g., annual grassland and oak savannah), known ecology of the species, and multiple records of CTS within several

miles south and west of the project. Lastly, the Biological Assessment provides a determination that the proposed project would have no effect on SJKF based on the lack of suitable habitat for the taxon at the proposed project site or in the immediate vicinity. The Service does not concur with this determination given the historic distribution of SJKF in the San Joaquin Valley, presence of suitable habitat throughout the action area (annual grassland and oak savannah), known ecology of the taxon, records of SJKF within less than 20 miles of the project, and the known distances the taxon may travel during short periods of time.

Consequently, the Service has determined that the proposed project is likely to adversely affect VELB, CTS, and SJKF. The proposed project site supports suitable habitat for each of these species. In addition, the proposed project activities (e.g., removal of vegetation within the active mining site [potential negative effect to VELB], grading and earth movement within the active mining site [CTS and SJKF], and roadway and road right-of-way improvements [CTS]) are of the type that could result in take of these species.

In addition, the Service has determined that the proposed project may affect, but is not likely to adversely affect the following species:

- San Joaquin Valley orcutt grass (*Orcuttia inaequalis*; federally-listed as threatened)
- succulent owl's clover (*Castilleja campestris* ssp. *succulenta*; federally-listed as threatened)
- vernal pool fairy shrimp (*Branchinecta lynchi*; federally-listed as threatened)
- vernal pool tadpole shrimp (*Lepidurus packardi*; federally-listed as endangered)

These species occur in vernal pool ecosystems. Since no project actions will occur within 250 feet of the nearest vernal pool, there will be no direct or indirect effects to those species or that ecosystem (see: Service 1996 [page 3]).

The findings and recommendations in this biological opinion are based on the following: (1) Biological Assessment; Madera Ranch Quarry Mining Operation; Prepared by Pacific Municipal Consultants (PMC); dated January 2006); (2) Recovery Plan for Upland Species of the San Joaquin Valley, California (Service 1998); (3) Assistance with the 5-Year Review of the Valley elderberry longhorn beetle (*Desmocereus californicus dimorphus*); Prepared by T. S. Talley et al. (2006); (4) Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*); 5-Year Review: Summary and Evaluation (Service 2006); (5) faxes, telephone calls, and electronic mail messages between the Service and PMC; and (6) other information available to the Service.

Consultation History

June 10, 2003.—North State Resources, Inc. (NSR) submitted a request to the Service for a list of federally-listed or proposed species that could occur in the vicinity of the proposed Madera Quarry mining operation.

July 8, 2003.—Chris Nagano (Service) transmitted a letter providing the species list requested by NSR on June 10, 2003.

January 2006. —Biological Assessment: Madera Ranch Quarry Mining Operation prepared by Pacific Municipal Consultants.

November 28, 2006. —Jeff Jorgenson (Service) met with Joyce Hunting (PMC) and Michael Bumgardner (Bumgardner Biological Consulting [BBC]) in regards to preparation and content of the Service's biological opinion.

March 14, 2007. —Site visit by Jeff Jorgenson (Service) and Ramon Aberasturi (Corps).

October 1, 2007. —Letter from MQI to Service regarding the approved quarry site, the approved processing area, proposed conservation easement, existing ponds (three), and proposed alternative for the fourth pond.

October 10, 2007. —Jeff Jorgenson, Susan Jones, and Ken Sanchez (Service) met with Joyce Hunting, Michael Bumgardner, and Jack Baker and Leonard Bandell (Madera Quarry, Inc. [MQI]) in regards to preparation and content of the Service's biological opinion. In particular, the range of conservation measures committed to by the project proponent that may be acceptable to the Service was discussed.

October 24, 2007. —Letter from MQI to Service regarding CTS and SJKF issues at the proposed project site.

December 17, 2007. —The Service issued a letter (81420-2008-TA-0496) to MQI in response to MQI's electronic mail dated November 19, 2007, requesting concurrence with proposed avoidance, minimization, and compensation measures for the proposed project. The Service's letter provides concurrence with MQI's identified avoidance, minimization, and compensation measures for the proposed project.

April 29, 2008. —Revised draft biological opinion submitted by MQI to Service to be finalized and signed.

BIOLOGICAL OPINION

Description of the Proposed Action

MQI proposes to develop a new hardrock quarry and associated facilities on approximately 121 acres of the 540± acre Madera Ranch in Madera County, California. The proposed project is located on Road 209, 16 miles northeast of the City of Madera. Associated with the quarry would be an aggregate processing facility, hot mix asphalt plant, administration complex, parking areas, various other stockpile and processing areas, and a two-lane paved haul road from the processing area west about ¼ mile to Road 209. In addition, Road 209 between State Route 41 and the new haul road would be improved and realigned to meet Madera County and Caltrans standards.

The proposed project site is located at: Township 10N, Range 20E, Sections 4, 9, 16, 21, 28, and 33 (MDBM; USGS Little Table Mountain, California 7.5-Minute Quadrangle).

Mining at the Madera Quarry would be conducted through several mining phases during up to 50 years. The initial phase will involve preliminary site clearing. Prior to any mining activity, vegetation will be removed in the immediate work areas and all topsoil will be removed and placed in the topsoil storage areas. Once site clearing is complete in the first phase of development, the second phase of the project will commence. This second phase involves mining with portable equipment, and is anticipated to last for approximately 5 to 10 years, depending on market conditions and other economic factors. Improvements to Road 209 and construction of the haul road will commence concurrently with this latter phase of mining. Upon completion of mining to the final grade for the "permanent" processing area, the third phase of the proposed project will commence. This phase involves the establishment of a larger capacity, stationary plant site. The fourth phase of the project will be the diversion of the unnamed intermittent drainage located within the mine area and completion of quarry mining. When sufficient material has been removed from the quarry, the intermittent drainage will be diverted from the point where it enters the quarry. The new channel will proceed northward to the north side of the mine area and then westerly and south to rejoin the original channel. Once this diversion has been completed, the mining of the balance of the site will commence. At the conclusion of aggregate production, a 3-year final reclamation phase would extend the total project lifespan to about 53 years. The maximum proposed aggregate production during the project life would be approximately 900,000 tons per year (about 533,000 cubic yards), resulting in a cumulative total of about 45 million tons (26.7 million cubic yards) of marketable material over the life of the project.

Listed below are conservation measures that have been agreed upon by the project proponent:

Conservation Measures for the Valley Elderberry Longhorn Beetle

To address effects to the VELB, the project proponent will provide compensatory mitigation in accordance with the compensation guidelines set forth in the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Service 1999). Therefore, the following measures will be

implemented as part of the proposed project to provide compensatory mitigation for effects to the VELB:

1. MQI shall remove the seven elderberry shrubs within the action area and transplant the shrubs to a Service-approved conservation area or conservation bank. The shrub removal and transplantation techniques will be in accordance with the guidelines set forth in the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Service 1999). A qualified biologist will be present on-site for the duration of the transplanting activities. The elderberry shrubs will only be transplanted when they are dormant and have lost their leaves (i.e., approximately November through the first 2 weeks of February).

2. Each elderberry stem measuring 1 inch or greater in diameter at ground level that is transplanted or destroyed will be compensated at the ratios recommended in the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Service 1999). Replacement plantings will then be based on the number and diameter of elderberry stems within the action area as shown in Table 1. These planting ratios are minimums, and the project proponent may plant more seedlings. However, success criteria (i.e., annual survival rates) will be based on the minimum number of seedlings required.

3. Stock of either seedlings or cuttings will be obtained from local sources. Cuttings may be obtained from the plants to be transplanted if the project site is near the conservation area. If the parent stock is obtained from a distance greater than 1 mile from the conservation area, approval by the Service of the native plant donor sites will be obtained prior to initiation of the revegetation work. If any elderberry shrubs are determined to be unsuitable candidates for transplanting, the Service will be contacted for permission to plant seedlings or cuttings at a higher ratio than those stated above for each elderberry shrub that cannot be transplanted.

4. If elderberry shrubs are to be transplanted to a conservation area, the conservation area will provide at least 1,800 square feet for each transplanted elderberry shrub and up to 10 plantings (i.e., elderberry seedlings and/or native plantings). The condition of the conservation area and associated elderberry and native plantings will be monitored over a period of 10 consecutive years. Monitoring reports will be submitted every year to the Service. If conservation plantings are done in stages, each stage of planting will have a different start date for the required monitoring time. Other specific items for managing the conservation area (e.g., long-term protection, weed control, pesticide and toxicant control, litter control, fencing, signs, etc.) will be implemented in accordance with the Service's guidelines.

Table 1: Elderberry Seedling and Associated Non-native Plant Compensation for the Madera Quarry Mining Operation.

Location	Stems (maximum diameter at ground level)	Exit Hole on Shrub (Yes or No)	Elderberry Seedling Ratio	Associated Native Plant Ratio	Number of Stems Observed	Required Elderberry Plantings	Required Associated Native Plant Plantings
Non-riparian	stems ≥1" & ≤3"	No	1:1	1:1	8	8	8
		Yes	2:1	2:1			
Non-riparian	stems >3" & <5"	No	2:1	1:1	6	12	12
		Yes	4:1	2:1			
Non-riparian	stems ≥5"	No	3:1	1:1	4	12	12
		Yes	6:1	2:1			
Riparian	stems ≥1" & ≤3"	No	2:1	1:1	5	10	10
		Yes	4:1	2:1			
Riparian	stems > 3" & <5"	No	3:1	1:1	1	3	3
		Yes	6:1	2:1			
Riparian	stems ≥5"	No	4:1	1:1	0	0	0
		Yes	8:1	2:1			
Total replacement plantings						45	45
Total Elderberry shrubs to be transplanted						7	
45/5 equals 9 VELB credits							

5. A minimum survival rate of at least 60 percent of the required elderberry plants and 60 percent of the required associated native plants will be maintained throughout the monitoring period. Within 1 year of discovery that survival has dropped below 60 percent for either set of plantings, failed plantings will be replaced to raise the survival rate above this level. The Service will be contacted to make any determinations regarding replacement responsibilities arising from circumstances beyond MQI's control (e.g., plants damaged or killed as a result of severe flooding or vandalism).

Conservation Measures for the California Tiger Salamander

The following measures will be implemented as part of the proposed project to provide[1] compensatory mitigation for effects to the CTS:

1. MQI shall compensate for the permanent loss of 135 acres of CTS upland habitat associated with development of the quarry, processing plant site, and haul road (120.9 acres [see MQI's Exhibit "A"]) and realignment of County Road 209 (14.6 acres) through the dedication of a Permanent Conservation Easement (PCE) to a monitoring and management entity acceptable to the Service (see measure 3).

2. MQI shall dedicate a Temporary Conservation Easement (TCE) to a monitoring and management entity acceptable to the Service (i.e., easement holder) as security pending the establishment of the PCE. While MQI is undertaking those activities described in Item 3 for the establishment of the PCE, it shall establish the TCE on a minimum of 405 acres of upland habitat as shown on MQI's Exhibit "B." The TCE shall be established to afford MQI time to undertake the activities described in measure 3 while not delaying issuance of the U.S. Army Corps of Engineers' permit for the proposed action.

3. MQI shall comply with the following conditions during establishment of the PCE:

   a. Develop a habitat management plan that will include, but not be limited to the following:

      (i) restrictions on surface disturbances that may affect habitat value for CTS;

      (ii) monitoring and management activities to maintain habitat value for CTS;

      (iii) restrictions on introduction of warm-water gamefish to on-site ponds;

      (iv) use of microbial larvicides, rather than mosquito fish or chemical agents, for mosquito control in on-site ponds;

      (v) restoration of the existing on-site pond noted as Pond #2 on MQI's Exhibit "C" as aquatic breeding habitat through an annual dry-down conducted during August or September to prevent bullfrog breeding and recruitment;

      (vi) creation of a new, on-site pond, shown as Pond #4C on MQI's Exhibit "C" (or other suitable site as determined by hydrologic analysis)[2], as suitable aquatic breeding habitat for CTS; and[2]

1 Exhibits A, B, and C were prepared by MQI and are referenced in the Service's letter dated December 17, 2007.
2 Exhibit D was prepared by MQI and shows two other potential sites for the creation of a new pond (i.e., Pond 4B and 4D). As the PCE boundaries are subject to change and approval by the Service, the fact that Pond 4B is bisected

(vii) delineation of the boundaries of the easement in perpetuity.

b. Dedicate the PCE to a monitoring and management entity acceptable to the Service (i.e., easement holder). The PCE shall be dedicated on that portion of the Madera Ranch shown as PCE on MQI's Exhibit "C" and comprise a minimum of 270 acres. Dedication of the PCE shall be done simultaneously with the Service extinguishing the TCE.

c. Dedicate an endowment to the easement holder for the PCE to cover the annualized costs of monitoring and management within the PCE. Such costs shall be calculated through a PAR analysis that is acceptable to the Service.

4. As an alternative to measure 3 above and at the sole discretion of MQI, MQI shall purchase 405 acres of CTS upland habitat mitigation credits from a Service-approved conservation bank (at a compensation ration of 3:1; acres conserved:acres developed).

5. Hauling operations on Road 209 will be limited to between 30 minutes after sunrise and 30 minutes before sunset during December 1 to February 28 (i.e., the season when most adult CTS would be moving to and from local breeding ponds).

Conservation Measures for the San Joaquin Kit Fox

The following measures will be implemented as part of the proposed project to provide compensation for effects to the SJKF:

1. MQI shall implement measures 1 through 3 under *Conservation Measures for the California Tiger Salamander*. These measures, as they apply to upland habitat, are considered appropriate and sufficient mitigation for the loss of 135 acres of habitat that is suitable for SJKF.

2. As an alternative to implementation of measures 1 through 3 under *Conservation Measures for the California Tiger Salamander* and at the sole discretion of MQI, MQI shall implement measure 4 under *Conservation Measures for the California Tiger Salamander*. However, the mitigation credits shall be purchased from a Service-approved conservation bank within the range of the SJKF as depicted in the Service's June 1, 2006, map of the SJKF Recovery Area.

3. MQI shall conduct preconstruction burrow clearances for SJKF within the 135 acres of suitable habitat that will be affected by development of the quarry, processing plant site, and haul road (120.9 acres [see MQI's Exhibit "A"]) and realignment of County Road 209 (14.6 acres). The burrow clearances shall be conducted in conformance with the

---

by the current boundary is of no consequence. The PCE boundary will be moved to the west to encompass that site if Pond 4B is chosen as the new pond site.

Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance (Service 1999).

Action Area

The action area of this proposed project is all areas to be affected directly or indirectly by the Federal action, and not merely the immediate area involved in the action. For this proposed project, the action area includes the quarry and associated facilities. In addition, the Road 209 improvement/realignment corridor is part of the action area. For the record, noise may also extend beyond the immediate area involved in the action (perhaps 0.5-1.0 miles), and may indirectly affect kit foxes that may be in the area, but will not be quantified at this time.

Status of the Species

Valley Elderberry Longhorn Beetle

On August 8, 1980, the valley elderberry longhorn beetle was listed as a threatened species and two areas along the American River in the Sacramento metropolitan area were designated critical habitat for the species (45 Federal Register 52803) (Service 1980). In addition, an area along Putah Creek, Solano County, and the area west of Nimbus Dam along the American River Parkway, Sacramento County, are considered essential habitat, according to the Recovery Plan for the VELB (Service 1984). These areas support large numbers of mature elderberry (*Sambucus* spp.) shrubs with extensive evidence of use by the VELB.

Longhorn beetles (family Cerambycidae) are characterized by somewhat elongate and cylindrical bodies with long antennae, often in excess of 2/3 of the length from about 13 to 21 mm (measured from the front of the head to the end of the abdomen) with antenna about as long as the body. Females are slightly more robust than males, measuring about 18 to 25 mm, with somewhat shorter antennae. The females are dark metallic-green with a bright red-orange border on the elytra (thickened, hardened forewings). The elytra of the males are mostly red-orange in color and have two metallic-green oblong spots on each wing cover.

The VELB is dependent on elderberry, which is a common component of the remaining riparian forests of the Central Valley. Use of the plant by the VELB, a wood borer, is rarely apparent. Frequently, the only exterior evidence of VELB use of an elderberry shrub is an exit hole created by the larva just prior to the pupal stage. Field work along the Cosumnes River and in the Folsom Lake area indicates that larval galleries can be found in elderberry stems with no evidence of an exit hole since the larvae may succumb prior to constructing an exit hole. Larvae appear to be distributed in stems which are 1 inch or greater in diameter at ground level.

Adult VELBs may be active from March through June. They are uncommon and rarely observed despite their large size and conspicuous coloration. They presumably mate at this time, but how they locate mates is unknown, although some other cerambycids appear to use pheromones. The females lay their eggs on the bark of an elderberry shrub (either *S. mexicana* or *S. racemosa* var. *microbotrys*). The larvae hatch in a few days and bore into the stem, where they remain, feeding

on the pith until they complete their development. The larva then cuts an emergence hole, pupates inside the stem, and finally emerges as an adult in the spring. The complete life cycle is thought to take one or two years. Adults are presumed to die after reproducing.

Population densities of the VELB are probably naturally low (Service 1984). Furthermore, it has been suggested, based on the spatial distribution of occupied elderberry shrubs (Barr 1991), that the VELB is a poor disperser. Thus, low density and limited dispersal capability may cause the VELB to be vulnerable to habitat fragmentation and the negative effects of isolation of small subpopulations.

Collinge *et al.* (2001) found that colonization of previously unoccupied elderberry sites within drainages occupied by the VELB is rare and that dispersal between drainages probably does not occur at all. This pattern implies that even when an individual VELB disperses from its host plant to colonize new habitat, it will only travel along the riparian corridor within its home drainage. Most remaining elderberry habitat and riparian vegetation exist in isolated patches or reaches of drainages. Consequently, the distances between VELB populations and unoccupied VELB habitat are believed to limit the species's ability to successfully colonize new sites.

The VELB, though relatively wide-ranging, is in long-term decline due to human activities that have resulted in widespread alteration and fragmentation of riparian habitats and, to a lesser extent, upland habitats that support the VELB. The primary threat to survival of the VELB continues to be loss and alteration of habitat by agricultural conversion, levee construction, stream and river channelization, removal of riparian vegetation, rip-rapping of shoreline, urban, recreational, industrial development, grazing, and ants.

Due to the secretive nature of the species, little is known about the distribution of the VELB. Its known range is largely based upon the presence of VELB exit holes in elderberry stems. Because of this secretive life history, most analysis of the range and impacts to the VELB are based upon the loss of requisite habitat (i.e., elderberry shrubs).

The VELB's current distribution is patchy throughout the remaining habitat of the Central Valley from Redding to Bakersfield. It appears to be only locally common since it is found in population clusters that are not evenly distributed across the available elderberry shrubs. Surveys conducted by Barr (1991) found evidence of VELB activity at 28 percent of the 230 sites with elderberry shrubs. Previously, Jones and Stokes (1987) had found evidence of occupancy in 65 percent of a total of 4,800 acres of riparian habitat along the Sacramento River. Frequently, only particular clumps or shrubs in the study areas were found to harbor the VELB. Occupied shrubs usually show evidence of repeated use over a period of several years, but sometimes only one or two exit holes are present. Similar observations on the clustered distribution of exit holes were made by Jones and Stokes (1987). Barr (1991) noted that elderberry shrubs with many exit holes were most often large, mature shrubs. Young elderberry shrubs were seldom occupied.

Certain drainages or areas appear to contain clusters or groupings of occupied elderberry shrubs. Areas in the San Joaquin Valley where the VELB has been found include the Kaweah and Tule Rivers in Tulare County, Stanislaus River in San Joaquin and Stanislaus counties, Tuolumne River in Stanislaus County, and the area near the community of Coarsegold in Madera County.

Between the listing of the VELB in 1980 and July 2000, the Service processed 172 consultations that involved the VELB and a total of 17,372 elderberry stems greater than 1 inch in diameter at ground level (Service file 1-1-00-F-0131). It is estimated that 3,784 elderberry shrubs were impacted though these section 7 consultations. This approximates the loss of 31 acres of riparian habitat. An estimated total of 50 elderberry shrubs, with a total of 479 stems over 1 inch in diameter at ground level, were impacted through five section 10(a)(1)(B) permits. Data are lacking for one section 10(a)(1)(B) project. Since January 2001 at least 956 stems over 1 inch at ground level have been impacted though additional section 7 consultations within the San Joaquin Valley and adjacent foothills.

Less study has been done on the loss of riparian areas within the Sierra Nevada foothills. Threats to riparian areas in the foothills include mining operations, hydroelectric generation plants, housing development, diversions for irrigation water or for flood control, and the building of roads and railroads (which often follow riparian corridors) (Kondolf *et al.* 1996).

Mining operations, some dating to the 1850's, impact riparian areas though alteration of the hydrology, changing of flood regimes, and sediment deposition (Kondolf *et al.* 1996). Within the Inyo National Forest alone, over 42,000,000 cubic meters of sediment have been introduced into riparian areas since 1850 (Kondolf *et al.*1996). A debris plain of over 64 square kilometers had been created along the Yuba River, burying many elderberry shrubs in an area known historically to have been inhabited by the VELB (Kondolf *et al.*1996). In a similar fashion, gravel mining may produce siltation, flooding, and other impacts to elderberry shrubs. It is estimated that 100,000,000 metric tons of aggregates, largely from alluvial plains at the base of the foothills, may be mined annually in California (Kondolf *et al.* 1996).

Hydroelectric plants and diversions have changed the previous hydrology in several ways. Inundation of riparian areas can drown elderberry shrubs and associated VELBs. Alteration of flood regimes impacts shrubs by increasing summer flows and reducing winter flows. Sediment load, necessary for periodic scouring of riparian areas, is typically reduced. The reduced scouring allows encroachment by non-native species, increases stress upon the native species, and reduces their competitive vigor. Accompanying hydroelectric facilities result in direct and indirect impacts from road construction, increased public access (both legal and illegal) through these roads, and dam construction. Stream narrowing through reduced flows is another impact that may occur in some areas (e.g., North Fork of the Kings River) (Kondolf *et al.* 1996). Diversions for irrigation purposes or for flood control produce similar impacts (Kondolf *et al.* 1996), both in the Sierra Nevada foothills and downstream in the Central Valley.

As urban encroachment becomes more prevalent, additional VELB habitat is lost through habitat conversion. Foothill riparian areas are often impacted the most by development projects (Kondolf *et al.* 1996). Increased recreational activities, growth of suburban areas into the

foothills along riparian corridors, fragmentation, and increased road building contribute to the loss of elderberry shrubs. Flood control and diversions for downstream urbanization also impact water levels, flood regimes, and subsurface flow dynamics that adversely alter the habitat of the VELB (Kondolf *et al.* 1996).

Valley Elderberry Longhorn Beetle Critical Habitat

Two areas along the American River in the Sacramento metropolitan area were designated as critical habitat for the VELB (45 Federal Register 52803) (Service 1980). Given that the proposed project does not occur in either of these two areas, it would not result in the adverse modification of critical habitat for the VELB.

California Tiger Salamander

The Central California population of the CTS was federally-listed as threatened throughout its range on August 4, 2004 (69 Federal Register 47212) (Service 2004a). Critical habitat for the Central California population of the CTS was designated on August 23, 2005 (70 Federal Register 49380) (Service 2005).

The CTS is a large, stocky, terrestrial salamander with a broad, rounded snout. Adults may reach a total length of 8.2 inches (Petranka 1998; Stebbins 2003). CTS exhibit sexual dimorphism (e.g., males tend to be larger than females). As adults, CTS tend to have creamy yellow to white spotting on the sides that becomes much reduced on the dorsal surface of the animal, whereas other tiger salamander species have brighter yellow spotting that is heaviest on the dorsum.

Historically, the CTS inhabited low elevation grassland and oak savannah in the Central Valley, adjacent foothills, and inner Coast Ranges in California (Storer 1925; Shaffer *et al.* 1993; Jennings and Hayes 1994). The species occurs from near sea level up to approximately 3,900 feet in the Coast Ranges and up to approximately 1,600 feet in the Sierra Nevada foothills (Shaffer *et al.* 2004). Along the Coast Ranges, the species occurred from the vicinity of Santa Rosa in Sonoma County to near Buellton in Santa Barbara County. In the Central Valley and surrounding foothills, the species occurred from northern Yolo County southward to northeastern Kern County and northern Tulare County.

The CTS has an obligate biphasic life cycle (Shaffer *et al.* 2004). Although breeding, egg-laying, and development of the larval salamanders occur in vernal pools and other ponds, the species otherwise spends most of its post-metamorphic life in widely-dispersed, underground retreats (Trenham *et al.* 2001; Shaffer *et al.* 2004). Subadult and adult CTS spend the dry summer and fall months of the year in the burrows of small mammals (e.g., California ground squirrel [*Spermophilus beecheyi*] and Botta's pocket gopher [*Thomomys bottae*]) (Storer 1925; Loredo and Van Vuren 1996; Petranka 1998; Trenham 1998a). These burrows provide protection from the sun and dry winds that are associated with the dry California climate. In addition, Camel crickets and other invertebrates that reside within these burrows provide a prey base for the species. Given that CTS utilize burrows created by other species (rather than dig their own burrows) and these burrows typically collapse within 18 months if not maintained, an active

population of burrowing mammals is necessary to sustain sufficient underground refugia for the species (Loredo *et al.* 1996).

The burrows inhabited by CTS are not estivation sites. Recent studies have demonstrated that individuals move, feed, and remain active in their burrows during the summer months (Trenham 2001; Van Hatten 2004). Individuals may even move between closely located burrows (Trenham 2001). In addition, researchers have long inferred that individuals are feeding while underground since they arrive at breeding ponds in good condition and are heavier when entering the pond than when leaving the pond.

Once the fall or winter rains begin, individuals emerge from their burrow (typically on rainy nights) to feed and migrate to the breeding ponds (Shaffer *et al.* 1993). Adult salamanders mate in the ponds, after which the females lay their eggs in the water (Twitty 1941; Shaffer *et al.* 1993, Petranka 1998). Historically, the CTS utilized vernal pools as breeding ponds. However, many current breeding sites also include stock ponds. Females attach their eggs singly, or in rare circumstances, in groups of two to four eggs to twigs, grass stems, other vegetation, or debris (Storer 1925; Twitty 1941). In ponds with no or limited vegetation, they may be attached to objects such as rocks and boards that are located on the pond bottom (Jennings and Hayes 1994). After breeding, adults leave the pond and return to the small mammal burrows (Loredo *et al.* 1996; Trenham 1998a) where they may continue to exit the burrows nightly for the next few weeks to feed (Shaffer *et al.* 1993). It should be noted that in drought years the seasonal ponds may not fill and adults do not breed (Barry and Shaffer 1994).

CTS eggs hatch in 10 to 14 days with newly hatched larvae ranging from 0.45 t 0.56 inches in total length (Petranka 1998). The larvae are entirely aquatic. The larvae feed on zooplankton, small crustaceans, and aquatic insects for about 6 weeks after hatching, after which they switch to larger prey (typically the larvae of other amphibian species) (J. Anderson 1968). They often rest on the bottom in shallow water, but may also be found at different depths in the water column in deeper water. The larvae are wary and when approached by potential predators, they dart into vegetation on the bottom of the pond (Storer 1925).

The larval stage of the CTS usually lasts 3 to 6x months as most seasonal ponds dry completely during the summer months (Petranka 1998). Amphibian larvae must develop to a critical minimum body size before they can metamorphose to the terrestrial stage (Wilbur and Collins 1973). Individuals collected near Stockton in the Central Valley during April varied from 1.88 to 2.32 inches in length (Storer 1925). Feaver (1971) found that larvae metamorphosed and left the breeding ponds 60 to 94 days after the eggs had been laid. Furthermore, larvae developed faster in smaller, more rapidly drying ponds. Thus, larvae and metamorphosing juveniles are larger in ponds that are inundated longer and are more likely to survive and reproduce (Pechmann *et al.* 1988; Semlitsch *et al.* 1988; Morey 1998; Trenham 1998b). The larvae will perish if the pond dries before metamorphosis is complete (P. Anderson 1968; Feaver 1971). Vollmar Consulting (2002) found that vernal pools occupied by CTS larvae in Merced County averaged 14.8 inches in depth, while vernal pools that were unoccupied averaged 6.0 inches in depth. Pechmann *et al.* (1988) found a strong positive correlation between ponding duration and total number of metamorphosing juveniles in five salamander species. In Madera County, Feaver (1971) found

that only 11 of 30 ponds sampled supported larval CTS, and five of these ponds dried before metamorphosis could occur. Therefore, out of the original 30 ponds, only 6 (20 percent) provided suitable conditions for successful reproduction that year. Size at metamorphosis is positively correlated with stored body fat and survival of juvenile amphibians, and negatively correlated with age at first reproduction (Semlitsch *et al.* 1988; Scott 1994); Morey 1998). In the late spring or early summer, before the ponds dry completely, metamorphosed juveniles leave the ponds and move into the upland habitat. This emigration occurs in both wet and dry conditions (Loredo and Van Vuren 1996; Loredo *et al.* 1996). Unlike during their winter migrations, the wet conditions that CTS prefer do not generally occur during the months when their breeding ponds begin to dry. As a result, juveniles may be forced to leave their ponds on rainless nights. Under these conditions, they may move only short distances to find suitable upland refugia (including leaf litter, desiccation cracks in the soil, and beneath boards or rocks in addition to small mammal burrows). These latter refugia are typically used temporarily and only until more suitable refugia can be found (i.e., small mammal burrows). Upon arrival of the next winter's rains individuals may then move further within the upland habitat. Once juvenile CTS leave their breeding ponds, they may not return to breed for four to five years. However, they remain active in the upland habitat and come to the surface during rainfall events to disperse or forage.

Lifetime reproductive success for CTS is low. Trenham *et al.* (2000) found that the average female bred 1.4 times and produced 8.5 young that survived to metamorphosis per reproductive effort. This resulted in approximately 11 metamorphic offspring over the lifetime of the female. Two reasons for the low reproductive success associated with this preliminary data are that most individuals require two years to become sexually mature, but some individuals may be slower to mature and do not breed until they are 4 to 6 years old (Shaffer et al. 1993). While individuals may survive for more than 10 years, many breed only once, and in some populations, less than five percent of marked juveniles survive to become breeding adults (Trenham 1998b). With such low recruitment, isolated populations are susceptible to unusual, randomly occurring natural events as well as from human caused factors that reduce breeding success and individual survival. Factors that repeatedly lower breeding success in isolated ponds can quickly extirpate a population.

Dispersal and migration movements made by adult CTS can be grouped into three categories: (1) post-metamorphosis dispersal; (2) breeding migration; and (3) interpond dispersal. After metamorphosis, juveniles move away from breeding ponds into the surrounding upland habitat where they live continuously for several years. At a study in Monterey County, it was found that upon reaching sexual maturity, most individuals returned to their natal (i.e., birth) pond to breed. However, 20 percent of the individuals dispersed to other ponds where they breed (Trenham *et al.* 2001). Following breeding, adult CTS return to the upland habitat where they may live for 1 or more years before breeding again Trenham *et al.* 2000).

CTS are known to travel relatively long distances from the breeding ponds into the surrounding upland habitat (given the size of the species). Maximum distances moved are difficult to establish for the species, but an individual in Santa Barbara County was found approximately 1.3 miles from the nearest known breeding pond (Sweet 1998) suggesting that the species may be able to move up to distances of this magnitude. As previously mentioned, CTS are known to

travel between breeding ponds. One study found that 20 to 25 percent of the individuals captured at one pond were later captured at other ponds approximately 1,900 and 2,200 feet away (Trenham *et al.* 2001). In addition to traveling long distances during breeding migrations or interpond dispersals, CTS may reside in burrows that are far from known breeding ponds. At one site in Contra Costa County, hundreds of CTS were captured 3 years in a row in upland habitat approximately 0.75 miles from the nearest known breeding pond (Orloff 2003).

Although observations show that CTS may travel far from breeding ponds, individuals typically reside in upland habitat that is closer to the breeding ponds. Evidence suggests that juvenile CTS disperse further into upland habitats than adult CTS. A trapping study conducted in Solano County during winter 2002-2003 found that juveniles used upland habitats further from breeding ponds than adults (Trenham and Shaffer in press). More juvenile individuals were captured at distances of 328, 656, and 1,312 feet from a breeding pond that at 164 feet. Approximately 20 percent of total captures were found 1,312 feet from a breeding pond. Fitting a distribution curve to the data revealed that 95 percent of juvenile individuals could be found within 2,099 feet with the remaining 5 percent being found at even greater distances. Preliminary results from the 2003-2004 trapping effort detected juvenile CTS at even greater distances, with a large proportion of the total CTS caught at 2,297 feet from the breeding pond (Trenham *et al.*, unpublished data). Surprisingly, most juveniles captured, even those at 2,100 feet, were still moving away from the ponds. In Santa Barbara County, juvenile CTS have been trapped approximately 1,200 feet away while dispersing from their breeding pond (Science Applications International Corporation, unpublished data). Such movements (particularly by juvenile CTS) may reflect a "hardwired" genetic behavior that increases the likelihood that a metapopulation will persist (particularly given the short and long-term ephemeral nature of vernal pool systems) if individuals travel longer distances where they may encounter other breeding ponds. This latter behavior and the known interpond dispersal behavior that has been demonstrated at some sites would appear to support this concept. Furthermore, interpond movements may also reduce local in-breeding depression, genetic drift, and founder effects that could occur if individuals only returned to their natal pond.

Post-breeding movements away from breeding ponds by adults appear to be much smaller. During post-breeding emigration, radio-telemetered adult CTS were tracked to burrows 62 to 813 feet from their breeding ponds (Trenham 2001). These reduced movements may be due to adult CTS having depleted physical reserves after breeding or due to the drier weather conditions that often occur during the period when adults leave the ponds. The reduced movement may also reflect the effects of the internally-placed radio-telemeter on the physiology of the individual. However, the shorter movement distances of adult CTS may also reflect the selective advantages of only moving as far away from the breeding pond as necessary to find suitable refugia (such that more energy goes into reproduction and less into travel costs).

Once CTS have moved into the surrounding upland habitat most individuals do not remain in a single burrow. Most individuals use several successive burrows at increasingly greater distances from the pond. Although the studies discussed above provide an approximation of the distances that CTS move from their breeding ponds, movement in the upland habitat is believed to be driven by the local habitat features. Trenham (2001) found that radio-telemetered adults favored

grassland with scattered large oaks over more densely wooded areas. A drift fence survey at a pond in Santa Barbara County found that many emigrating juveniles moved towards an adjacent strawberry field. However, no adults were captured returning to the pond from this direction. Nor, did many CTS return to the pond from the direction of adjacent sandhill or eucalyptus habitats found in other quadrants. Most of the CTS returning to the pond were captured coming from a nearby, extensive overgrazed grassy flat (Steve Sykes, pers. comm.). Furthermore, based on studies of radio-telemetered individuals, CTS do not appear to favor specific corridors for movement in the upland habitat (Trenham 2001). At two ponds completely encircled by drift fence and pit fall traps, captures of arriving adults and dispersing juveniles were distributed randomly around the ponds. Therefore, it appears that dispersal into the surrounding upland habitat occurs randomly with respect to direction and habitat types.

The CTS is imperiled throughout its range by a variety of human activities (Service 2004a). Current factors associated with declining populations of CTS include continued degradation and loss of habitat due to agriculture and urbanization, hybridization with non-native eastern tiger salamanders (*Ambystoma tigrinum*) (Riley *et al.* 2003; Fitzpatrick and Shaffer 2006), and introduced aquatic predators (e.g., bullfrog, mosquitofish, and gamefish). Other threats include predation and competition from introduced, exotic species; disease; various chemical contaminants; road-crossing mortality; and certain unrestrictive mosquito and rodent control programs. Furthermore, the various primary and secondary threats are not currently being offset by existing Federal, State, or local regulatory mechanisms. The CTS is also vulnerable to chance environmental or demographic events (particularly small populations which are especially vulnerable).

Although most populations are likely threatened by more than one factor, conversion of natural habitat to modified habitat for urban and agricultural uses (T. Jones *in litt.* 1993; Service 2003, 2004a, 2004b; Shaffer *et al.* 1993), and fragmentation of existing habitat represent the most significant current threats to the CTS. Some of the largest remaining populations of CTS are in areas that are severely threatened by new urban development, including the Livermore Valley, Santa Clara Valley, and eastern Fresno County. Urban effects that threaten CTS survival include housing, commercial, and industrial developments; road construction and widening; golf course construction and maintenance; trash dumping, landfill operation, and expansion; and the operation of gravel mines and quarries. Agricultural activities that threaten CTS survival include disking and deep-ripping, as well as the cultivation, planting, and maintenance of row crops, orchards, and vineyards. Historically, California supported approximately 15.59 million acres of valley and coastal grasslands, blue oak/foothill pine, valley oak, or mixed hardwood lands (Kuchler 1988). Urbanization and intensive agriculture have eliminated virtually all valley grassland and oak savanna habitat from the Central Valley floor. Currently there are about 1.1 million acres of such habitat where the California tiger salamander is still potentially extant.

The relative loss of native habitat has been even more extreme with respect to vernal pools, the historic breeding habitat of the CTS. Remaining vernal pool complexes are now fragmented and reduced in area. Where vernal pools remain, they are often disturbed and degraded by drainage modification, overgrazing, off road vehicles use, non-native plant invasion, trash dumping, road construction, and urban development (Jones and Stokes Associates 1987, Service 1994). The

annual loss of vernal pool habitat in Madera County from 1987 to 1997 was estimated by Holland (1998) at 0.4 percent (413 acres per year). However, there is reason to believe that the amount of vernal pool loss may have been underestimated for all counties assessed by Holland (including Madera County) given that the 1987 baseline mapping methodology was less refined than the mapping used in 1997.

While CTS breed successfully in artificial ponds (e.g., bermed or stock ponds), these ponds often are poorer habitat for CTS than are natural vernal pools. Hydroperiods in artificial ponds may be so short that larvae cannot metamorphose, or so long that predatory fish and bullfrogs can colonize the pond (Shaffer *et al.* 1993, Seymour and Westphal 1994). Artificial ponds that are managed to maintain year-round water often become attractive as a site for the introduction of gamefish. The result of these introductions is the extirpation of the CTS that breed in the ponds (Shaffer *et al.* 1993, Seymour and Westphal 1994).

In addition to direct loss of habitat, the widespread conversion of undisturbed land to residential and agricultural uses has fragmented habitat throughout the range of the CTS and has isolated several remaining populations (Shaffer *et al.* 1993). Isolation and fragmentation of habitats within many watersheds have precluded dispersal between subpopulations and jeopardized the viability of metapopulations (i.e., adjacent subpopulations that occasionally exchange individuals (and genes) through dispersal and that are capable of colonizing new habitat patches or recolonizing habitat from which a population was extirpated).

A number of non-native species have adversely affected the CTS through predation and competition. A strong negative correlation exists between bullfrog presence and CTS presence (Shaffer *et al.* 1993, Seymour and Westphal 1994). Morey and Guinn (1992) documented a shift in amphibian community composition at a vernal pool complex, with CTS becoming proportionally less abundant as bullfrogs increased in number. Mosquito fish (*Gambusia affinis*) likely have also adversely affected CTS via predation and competition. Loredo-Prendeville *et al.* (1994) failed to find any CTS inhabiting ponds containing mosquito fish. About 50 local mosquito abatement districts introduce this species of fish throughout the state (Boyce *in litt.* 1994).

A number of other non-native species have been directly implicated in predation of CTS or appear to have the potential to do so. Introductions of largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), catfish (*Ictalurus* spp.), and fathead minnows (*Pimephales promelas*) likely eliminated tiger salamanders from several breeding sites in Santa Barbara County (Service 2000a). Non-native sunfish, catfish, and bullheads (*Ameiurus* spp.) have been and still are widely introduced into many ponds in California for sport fishing. Crayfish (*Pacifastacus, Orconectes,* and *Procambarus* spp.) are known to prey on California newt eggs and larvae, despite toxins they produce (Gamradt and Kats 1996). Thus, these crayfish also likely prey on CTS.

Like most amphibians, CTS inhabit both aquatic and terrestrial habitats at different stages in their life cycle. They are exposed, therefore, to both aquatic and terrestrial pollutants due to their highly permeable skin (Blaustein and Wake 1990). During 2001, the 23 counties where CTS

occur used over 105 million pounds of pesticides (California Department of Pesticide Regulation Internet website, December 2002). Some of these pesticides are extremely toxic to aquatic organisms, including amphibians and the organisms on which they prey. Some of these pesticides, such as chloropyrifos, malathion, and endosulfin are cholenesterase inhibitors. Reduced cholenesterase activity has been linked to uncoordinated swimming, increased vulnerability to predation, depressed growth, and increased mortality in larvae (de Lamas *et al.* 1985, Rosenbaum *et al.* 1988, Bridges 1997, Berrill *et al.* 1998, Sparling *et al.* 2001). Even when toxic or detectable amounts of pesticides are not found in breeding ponds or groundwater, CTS may still be affected, particularly by chemicals applied during the migration and dispersal seasons. Sparling *et al.* (2001) examined pesticide usage and amphibian (*Rana* and *Bufo* spp.) population declines in California and provided evidence that pesticides are instrumental in the declines of these species.

Widespread control of ground squirrels and pocket gophers may also pose a significant threat to the CTS. Ground squirrel control is conducted by trapping, shooting, fumigation, toxic (including anticoagulant) baits, and habitat modification (including deep-ripping of burrow areas) (UCIPM Internet website, January 2003). Ground squirrel and pocket gopher control may have the indirect effect of reducing the number of upland burrows available to specific CTS populations (Loredo-Prendeville *et al.* 1994).

Light-to-moderate livestock grazing by cattle, sheep, and horses is generally thought to be compatible with continued successful use of rangelands by the CTS, provided the grazed areas do not also have intensive burrowing rodent control efforts (T. Jones, *in lit.* 1993, Shaffer *et al.* 1993, S. Sweet, personal communication 1998, B. Shaffer and P. Trenham, personal communication 2003). By maintaining shorter vegetation, grazing may make areas more suitable for ground squirrels whose burrows are essential to CTS.

Conservation of the CTS requires a five-pronged approach: (1) maintaining the current genetic structure across the species' range; (2) maintaining the current geographic, elevational, and ecological distribution; (3) protecting the hydrology and water quality of breeding pools and ponds; (4) retaining or providing for connectivity between breeding locations for genetic exchange and recolonization; and (5) protecting sufficient barrier-free upland habitat around each breeding location to allow for sufficient survival and recruitment to maintain a breeding population over the long term. Specific actions that help meet these goals include, but are not limited to (1) protection, restoration, and management of large blocks of contiguous aquatic and terrestrial habitat; (2) management of stock ponds to eliminate or reduce populations of non-native predators; (3) elimination of non-native tiger salamanders and their hybrids; and (4) reduced exposure to contaminants, particularly in the vulnerable larval stages (Service 2004b, 2005).

California Tiger Salamander Critical Habitat

Critical habitat was designated in a final rule for the Central California population of the CTS on August 23, 2005 (70 Federal Register 49380) (Service 2005). Critical habitat had been proposed for the Central California population on August 10, 2004 (69 Federal Register 48570) (Service

2004b). The Service divided the current range of the Central California population into four geographic regions: (1) Central Valley; (2) Southern San Joaquin Valley; (3) East Bay; and (4) Central Coast. These latter regions reflect the unique genetic structure of the population. A total of 15,089 acres were designated as critical habitat for the species in Madera County. However, the action area is located outside of the designated critical habitat units. The nearest critical habitat unit is Unit 1a (Millerton Unit - Southern San Joaquin Valley Geographic Region) which is located southeast of the proposed project. This 3,803-acre unit is located approximately 1.5 miles east of State Route 41 and north of the San Joaquin River. The northern boundary is south of Berry Hill along O'Neal Road.

San Joaquin Kit Fox

The SJKF was federally-listed as endangered throughout its range on March 11, 1967 (32 Federal Register 4001). It was subsequently listed as a threatened species by the State of California on June 27, 1971. The recovery of the taxon is addressed in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (Service 1998). Critical habitat for SJKF has not been designated or proposed.

The SJKF is a small canid with an average body length of 20 inches. It is lightly built, with long legs and large ears, and weighs approximately 5 pounds. Pelage color ranges from tan to buffy gray in the summer to silvery gray in the winter. The belly is whitish and the tail is black-tipped. The SJKF is active year-round and most activity is nocturnal. The grizzled coloration and black-tipped tail assist in distinguishing the SJKF from larger canids, such as red fox (*Vulpes vulpes*) (4 to 5 kilograms; 9 to 11 pounds) and gray fox (*Urocyon cinereoargenteus*) (approximately 3.6 kilograms; 8 pounds). The gray fox is similar in coloration to the SJKF, but has a dark stripe running the length of the top of tail (Grinnell *et al.* 1937).

In the San Joaquin Valley prior to 1930, the range of the SJKF extended from southern Kern County north to Tracy, San Joaquin County, on the west side, and to near La Grange, Stanislaus County, on the east side (Grinnell *et al.* 1937; Service 1998). Historically, the taxon occurred in several San Joaquin Valley native plant communities. In the southernmost portion of the range, these communities included valley sink scrub, valley saltbush scrub, upper Sonoran subshrub scrub, and annual grassland. The SJKF has also exhibited a capacity to utilize habitats that have been altered by man. It is present in many oil fields, grazed pasture lands, and "wind farms" (Cypher 2000). It can inhabit the margins and fallow lands near irrigated row crops, orchards, and vineyards, and may forage occasionally in these agricultural areas (Service 1998). The SJKF appears to prefer more gentle terrain and generally decreases in abundance when terrain ruggedness increases (Grinnell *et al.* 1937; Morrell 1972; Warrick and Cypher 1998).

Dens are used by the SJKF for temperature regulation, shelter from adverse environmental conditions, and escape from predators. It excavates its own dens, but also uses dens or burrows excavated by other animals. It may also use human-made structures (e.g., culverts, abandoned pipelines, and banks in sumps or roadbeds). It often changes dens and may use many dens throughout the year. Individuals have been reported to use up to 70 different dens (Hall 1983). At the Naval Petroleum Reserve, individual SJKFs used an average of 11.8 dens per year

(Koopman *et al.* 1998). The SJKF is subject to competitive exclusion or predation by other species, such as the non-native red fox, coyote (*Canis latrans*), domestic dog (*C. familiaris*), bobcat (*Felis rufus*), and large raptors. Den switching by the taxon may be function of predator avoidance, local food availability, or external parasite infestations (e.g., fleas) in dens (Egoscue 1956).

The diet of the SJKF varies geographically, seasonally, and annually, based on temporal and spatial variation in abundance of potential prey. In the southern portion of its range, kangaroo rats (*Dipodomys* spp.), pocket mice (*Perognathus* spp.), white-footed mice (*Peromyscus* spp.), and other nocturnal rodents comprise about 1/3 or more of the diet. The SJKF also preys on the California ground squirrel, black-tailed hare (*Lepus californicus*), San Joaquin antelope squirrel (*Ammospermophilus nelsoni*), desert cottontail (*Sylvilagus audubonii*), ground-nesting birds, and insects.

The diets and habitats selected by coyotes and SJKFs living in the same area are often quite similar. Consequently, the potential for resource competition between these canids may be quite high when prey resources are scarce such as during droughts (a condition that occurs with some regularity in semi-arid central California). Competition for resources between coyotes and SJKFs may result in SJKF mortalities. Coyote-related injuries accounted for 50 to 87 percent of the mortalities of radio-collared SJKF at the Carrizo Plain Natural Area, Lokern Natural Area, Naval Petroleum Reserves, and Camp Roberts (Cypher and Scrivner 1992; Standley *et al.* 1992).

The SJKF is primarily nocturnal, although individuals are occasionally observed resting or playing (mostly pups) near their dens during the day (Grinnell *et al.* 1937). It occupies home ranges that vary in size from 4.3 to 11.6 square kilometers (1.7 to 4.5 square miles) (White and Ralls 1993). Each home range is usually occupied by a mated pair of SJKF and their current litter of pups. Other adults, usually offspring from previous litters, also may be present (Koopman *et al.* 2000), but individuals often move independently within their home range (Cypher 2000). Average distances traveled each night range from 9.4 to 14.6 kilometers (5.8 to 9.1 miles) and are greatest during the breeding season (Cypher 2000).

Individuals maintain core home range areas that are exclusive to mated pairs and their offspring (White and Ralls 1993; Spiegel 1996; White and Garrott 1997). This territorial spacing behavior eventually limits the number of SJKF that can inhabit an area owing to shortages of available space and/or per capita prey. Consequently, as habitat is fragmented or destroyed, the carrying capacity of an area is reduced and a larger proportion of the population is forced to disperse. Increased dispersal generally leads to lower survival rates and, in turn, decreased abundance because greater than 65 percent of dispersing juvenile SJKF die within 10 days of leaving their natal range (Koopman *et al.* 2000).

The SJKF is primarily monogamous and usually breeds in December and January. After a gestation of 48 to 54 days, pups are born during late January to March (Zoellick et al. 1987). Mean litter sizes reported for the SJKF include 2.0 pups on the Carrizo Plain (White and Ralls 1993), 3.0 pups at Camp Roberts (Spencer et al. 1992), 3.7 pups in the Lokern Natural Area (Spiegel and Tom 1996), and 3.8 pups at the Naval Petroleum Reserves (Cypher et al. 2000).

Pups appear above ground at about 3 to 4 weeks of age, and are weaned at 6 to 8 weeks of age. Reproductive rates, the proportion of females bearing young, of adult SJKF vary annually with environmental conditions such as food availability. The annual rate ranges from 0 to 100 percent while reported mean rates include 61 percent at the Naval Petroleum Reserves (Cypher et al. 2000), 64 percent in the Lokern Natural Area (Spiegel and Tom 1996), and 32 percent at Camp Roberts (Spencer et al. 1992). Although some yearling female SJKF will produce young, most do not produce until 2 years of age (Spencer et al. 1992; Spiegel and Tom 1996; Cypher et al. 2000). Some young of both sexes, but particularly females, may delay dispersal and may assist their parents in raising the following year's litter of pups (Spiegel and Tom 1996).

Juvenile SJKF begin dispersing as early as June with peak dispersal occurring in July. The age at dispersal ranges from 4 to 32 months (Cypher 2000). Among juvenile SJKF surviving to July 1 at the Naval Petroleum Reserves, 49 percent of the males dispersed from natal home ranges while 24 percent of the females dispersed (Koopman et al. 2000). Among dispersing SJKF, 87 percent did so during their first year of age. As indicated above, most of the dispersing juveniles (i.e., 65.2 percent) at the Naval Petroleum Reserves died within 10 days of leaving their natal home den (Koopman et al. 2000). Some SJKF delay dispersal and may inherit their natal home range. Dispersal distances of up to 123 kilometers (76.3 miles) have been documented for the SJKF (Scrivner et al. 1993).

Mean annual survival rates reported for adult SJKF include 0.44 percent at the Naval Petroleum Reserves (Cypher et al. 2000), 0.53 percent at Camp Roberts (Standley et al. 1992), 0.56 percent at the Lokern Natural Area (Spiegel and Disney 1996), and 0.60 percent on the Carrizo Plain (Ralls and White 1993). However, survival varies widely among years (Spiegel and Disney 1996; Cypher et al. 2000). Mean survival rates for juvenile SJKF (< 1 year old) are lower than rates for adults. Survival to 1 year of age was 0.14 percent at the Naval Petroleum Reserves (Cypher et al. 2000), 0.20 percent at Camp Roberts (Standley et al. 1992), and 0.21 percent on the Carrizo Plain (Ralls and White 1995). For both adults and juveniles, survival rates of males and females are similar. SJKF may live to 10 years of age in captivity (McGrew 1979) and 8 years of age in the wild (Berry et al. 1987), but most SJKF do not live past 2 to 3 years of age.

Several species prey upon the SJKF. In addition, some predators, such as coyote, bobcat, red fox, American badger (*Taxidea taxus*), and golden eagle (*Aquila chrysaetos*) will kill SJKF in non-predatory encounters. The coyote, red fox, and American badger also may compete for den sites (Service 1998).

Since the listing of the SJKF in 1967, several threats that limit the taxon's populations have been identified. These threats include, but are not limited to, loss of habitat, competitive interactions with other canids, disease, pesticides and rodenticides, roadway mortality, increased ambient noise, and risk of extinction from small population size, isolation, and high natural fluctuation in abundance.

Less than 20 percent of the habitat within the historical range of the SJKF remained when the taxon was listed as federally-endangered in 1967, and there has been a substantial net loss of habitat since that time. Historically, the SJKF occurred within much of the San Joaquin Valley

and adjacent foothills. However, extensive land conversions in the San Joaquin Valley began as early as the mid-1800s with the Arkansas Reclamation Act and by the 1930s the range of the SJKF had been reduced to the southern and western parts of the San Joaquin Valley (Grinnell et al. 1937). The primary factor contributing to this restricted distribution was the conversion of native habitat to irrigated cropland, industrial uses (e.g., hydrocarbon extraction), and urbanization (Laughrin 1970; Jensen 1972; Morrell 1972, 1975). Approximately one-half of the natural communities in the San Joaquin Valley were tilled or developed by 1958 (Service 1980a).

This rate of loss accelerated following the completion of the Central Valley Project and State Water Project, which diverted and imported new water supplies for irrigated agriculture (Service in litt. 1995a). Approximately 1.97 million acres of habitat, or about 66,000 acres per year, were converted in the San Joaquin Valley region between 1950 and 1980 (California Department of Forestry and Fire Protection 1988). The counties noted as having the highest wildland conversion rates included Kern, Tulare, Kings, and Fresno counties (all of which were occupied by the SJKF). From 1959 to 1969 alone, an estimated 34 percent of natural lands were lost within the range of the SJKF as it was known at that time (Laughrin 1970).

By 1979, approximately 370,000 acres out of a total of approximately 8.5 million acres on the San Joaquin Valley floor remained as non-developed land (Williams 1985; Service 1980a). Data from the CDFG (1985) and Service file information indicate that between 1977 and 1988, essential habitat for the blunt-nosed leopard lizard (*Gambelia sila*), a species that occupies habitat that is also suitable for the SJKF, declined by approximately 80 percent (from 311,680 acres to 63,060 acres or approximately 22,000 acres per year) (Biological Opinion for the Interim Water Contract Renewal, Ref. No. 1-100F-0056 February 29, 2000). Virtually all of the documented loss of essential habitat was the result of conversion to irrigated agriculture.

During 1990 to 1996, a gross total of approximately 71,500 acres of habitat was converted to farmland in 30 counties within the Conservation Program Focus areas of the Central Valley Project. This figure includes 42,520 acres of grazing land and 28,854 acres of "other" land which is predominantly comprised of native habitat. During this same time period, approximately 101,700 acres were converted to urban land use within the Conservation Program Focus areas (California Department of Conservation 1994, 1996, 1998). This figure includes 49,705 acres of farmland, 20,476 acres of grazing land, and 31,366 acres of "other" land which is predominantly comprised of native habitat. Given that these assessments include a substantial portion of the Central Valley and adjacent foothills, they provide the best scientific and commercial information currently available regarding the patterns and trends of land conversion within the SJKF's range. In summary, more than 1 million acres of suitable habitat for the SJKF have been converted to agriculture, municipal, or industrial uses since the listing of the SJKF. In contrast, less than 500,000 acres have been preserved or are subject to community-level conservation efforts designed, at least in part, to further the conservation of the SJKF (Service 1998).

Land conversions contribute to declines in SJKF abundance through direct and indirect mortalities, displacement, reduction of prey populations and den sites, changes in the distribution and abundance of larger canids that compete with the SJKF for resources, and reductions in

carrying capacity. The SJKF may also be buried in dens during land conversion activities (Knapp and Chesemore 1987) or permanently displaced from areas where structures are erected or the land is intensively irrigated (Jensen 1972; Morrell 1975). Furthermore, even moderate fragmentation or loss of habitat may significantly impact the abundance and distribution of the SJKF. Capture rates of SJKF at the Naval Petroleum Reserves in the Elk Hills were negatively associated with the extent of oil-field development after 1987 (Warrick and Cypher 1998). Likewise, the California Energy Commission found that the relative abundance of SJKF was lower in oil-developed habitat than in nearby undeveloped habitat on the Lokern Natural Area (Speigel 1996). Researchers from both studies inferred that the most significant effect of the oil development was the lowered carrying capacity for populations of both SJKF and their prey species due to changes in habitat characteristics or loss and fragmentation of habitat (Speigel 1996; Warrick and Cypher 1998).

Dens are essential for the survival and reproduction of the SJKF. The taxon uses dens year-round for shelter and escape, and in the spring for rearing pups. Hence, SJKFs generally have dozens of dens scattered throughout their territory. However, land conversion reduces the number of typical, earthen dens available to the taxon. For example, the average density of typical, earthen SJKF dens at the Naval Petroleum Reserves was negatively correlated with the intensity of the petroleum development (Zoellick et al. 1987), and almost 20 percent of the dens in developed areas were found to be in well casings, culverts, abandoned pipelines, oil well cellars, or in the banks of sumps or roads (O'Farrell 1983). These results are important because the California Energy Commission found that even though SJKF frequently used pipes and culverts as dens in oil-developed areas of western Kern County, only earthen dens were used to birth and wean pups (Speigel 1996). Similarly, SJKFs in Bakersfield use atypical dens, but have only been found to rear pups in earthen dens (P. Kelly, Endangered Species Recovery Program, Fresno, pers. comm.. to P. White, Fish and Wildlife Service, April 6, 2000). Hence, the fragmentation of habitat and destruction of earthen dens could adversely affect the reproductive success of SJKF. Furthermore, the destruction of earthen dens may also affect SJKF survival by reducing the number and distribution of escape refugia that are used to avoid predators.

Land conversions and associated human activities can lead to widespread changes in the availability and composition of mammalian prey for the SJKF. For example, oil field disturbances in western Kern County have resulted in shifts in the small mammal community from the primarily granivorous species (e.g., *Dipodomys* spp.), that are the staple prey of the SJKF (Speigel 1996; Cypher et al. in press), to species adapted to early successional vegetation and disturbed areas (e.g., California ground squirrel) (Speigel 1996; Cypher et al. in press). Since SJKF reproductive rates are strongly influenced by food supply, decrease during periods of prey scarcity (White and Garrott 1997, 1999), and more than 70 percent of the diet of the SJKF consists of leporids (*Lepus* and *Sylvilagus* spp.) and kangaroo rats (*Dipodomys* spp.), changes in small mammal community composition may then influence SJKF reproductive rates (particularly given that SJKF continues to feed on the staple prey species during ephemeral periods of prey scarcity).

Extensive habitat destruction and fragmentation have contributed to smaller, more isolated populations of the SJKF. Small populations have a higher probability of extinction than larger

populations because their low abundance renders them susceptible to stochastic (i.e., random) events such as high variability in age and sex ratios, and catastrophes such as floods, droughts, or disease epidemics (Lande 1988; Frankham and Ralls 1998; Saccheri et al. 1998). Similarly, isolated populations are more susceptible to extinction by accidental or natural catastrophes because their recolonization is hampered. These chance events can adversely affect small, isolated populations with devastating results, as evidenced by the decimation of the sole remaining wild colony of black-footed ferrets (*Mustela nigripes*) following its infection with canine distemper (May 1986). Extirpation can even occur when the members of a small population are healthy, since whether the population increases or decreases in size is less dependent on the age-specific probabilities of survival and reproduction than on raw chance (sampling probabilities). Owing to the probabilistic nature of extinction, many small populations will eventually go extinct when faced with these stochastic risks (Caughley and Gunn 1996).

Oil fields in the southern half of the San Joaquin Valley also continue to be an area of expansion and development activity. This expansion is reasonably certain to increase in the near future owing to market-driven increases in the price of oil. The cumulative and long-term effects of oil extraction activities on SJKF populations are not fully known, but recent studies indicate that moderate to high-density oil fields may contribute to a decrease in carrying capacity for SJKFs due to habitat loss or changes in habitat characteristics (Speigel 1996; Warrick and Cypher 1998).
In summary, the new infrastructure and increased reserve capacity necessary for continued population growth and development within the Central Valley is currently being provided. There are no limiting factors or regulations that are likely to retard this development or force it to other areas which are already served. Hence, it is reasonably certain that development will continue to destroy and fragment SJKF habitat into the foreseeable future.

The diets and habitats selected by coyotes and SJKFs living in the same geographic area are often quite similar (White et al. 1995; Cypher and Spence 1998). Hence, the potential for resource competition between these two canids may be quite high when prey resources are scarce. Land conversion and associated human activities have led to changes in the distribution and abundance of coyotes, which compete with SJKFs for resources. Coyotes occur in most areas with abundant populations of the SJKF. Furthemore, during the last few decades coyote abundance has increased in many areas owing to a decrease in ranching operations, favorable landscape changes, and reduced control efforts (Orloff et al. 1986; Cypher and Scrivner 1992; White and Ralls 1993; White et al. 1995). Coyotes may attempt to lessen resource competition by killing SJKFs. Coyote-related injuries accounted for 50 to 87 percent of the mortalities of radio-collared SJKF at the Carrizo Plain Natural Area, Lokern Natural Area, Naval Petroleum Reserves, and Camp Roberts (Cypher and Scrivner 1992; Standley et al. 1992). Coyote-related deaths of adult SJKF appear to be largely additive (i.e., in addition to deaths caused by other mortality factors such as disease and starvation) rather than compensatory (i.e., tending to replace deaths due to other mortality factors) (White and Garrott 1997). Hence, the survival rates of adult SJKF decrease significantly as the proportion of mortalities caused by coyotes increase (Cypher and Spencer 1998; White and Garrott 1997), and increases in coyote abundance may contribute to significant declines in SJKF abundance (Cypher and Scrivner 1992; Ralls and White 1995; White et al. 1996). There is some evidence that the proportion of juvenile SJKF killed by coyotes increases

as SJKF density increases (White and Garrott 1999). This density-dependent relationship would provide a feedback mechanism that reduces the amplitude of SJKF population dynamics and keeps SJKF at lower densities than they might otherwise attain. As such, coyote-related mortalities may dampen or prevent SJKF population growth or accentuate, hasten, or prolong population declines.

Land use changes also contributed to the expansion of the non-native red fox into areas inhabited by the SJKF. Historically, the geographic range of the native red fox did not overlap with that of the SJKF. However, by the 1970s introduced and escaped red foxes had established breeding populations in many areas inhabited by the SJKF (Lewis et al. 1993). The larger and more aggressive red foxes are known to kill SJKFs (Ralls and White 1995), and may displace SJKFs, as has been observed in the arctic when red foxes expanded into the range of the smaller arctic fox (Hersteinsson and MacDonald 1992). The increased abundance and distribution of non-native red foxes will also likely adversely affect the status of the SJKF since they are closer morphologically and taxonomically, and will likely have higher dietary overlap, potentially resulting in more intense competition for resources. Two documented deaths of SJKF due to red foxes have been reported (Ralls and White 1995), and red foxes appear to be displacing SJKFs in the northwestern part of their range (Lewis et al. 1993). At Camp Roberts, red foxes have usurped several dens that were used by SJKFs during previous years (California Army National Guard, Camp Roberts Environmental Office, unpubl. data). In addition, opportunistic observations in the cantonment area of Camp Roberts have increased five-fold since 1993, and no SJKF have been sighted or captured in this area since October 1997. Furthermore, a telemetry study of sympatric red foxes and SJKFs in the Lost Hills area has detected spatial segregation between the two species, suggesting that SJKFs may avoid or be excluded from red fox-inhabited areas (P. Kelly, Endangered Species Recovery Program, Fresno, pers. comm.. to P. White, Fish and Wildlife Service, April 6, 2000). Such avoidance would limit the resources available to local populations of the SJKF and possibly result in decreased SJKF abundance and distribution.

Wildlife diseases do not appear to be a primary mortality factor that consistently limits SJKF populations throughout the taxon's range (McCue and O'Farrell 1988; Standley and McCue 1992; Miller et al. 1998). However, central California has a high incidence of wildlife rabies cases (Schultz and Barrett 1991), and high seroprevalence of canine distemper virus and canine parovirus indicate that SJKF populations have been exposed to these diseases (McCue and O'Farrell 1988; Standley and McCue 1992; Miller et al. 1998). Hence, disease outbreaks could potentially cause substantial mortality or contribute to reduced fertility in seropositive females, as was noted in closely-related swift foxes (*Vulpes velox*) (Miller et al. 1998). For example, there are some indications that the rabies virus may have contributed to a catastrophic decrease in SJKF abundance at Camp Roberts (San Luis Obispo County) during the early 1990s. San Luis Obispo County had the highest incidence of wildlife rabies cases in California during 1989 to 1991, and striped skunks (*Mephitis mephitis*) were the primary vector (Barrett 1990; Schultz and Barrett 1991; Reilly and Mangiamele 1992). A rabid skunk was trapped at Camp Roberts during 1989 and two SJKF were found dead due to rabies in 1990 (Standley et al. 1992). Captures of SJKF during annual livetrapping sessions at Camp Roberts decreased from 103 to 20 individuals during 1988 to 1991. Captures of SJKF were positively correlated with captures of skunks during 1988 to 1997, suggesting that some factor such as rabies virus was contributing to

concurrent decreases in the abundance of these species. Also, captures of the SJKF at Camp Roberts were negatively correlated with the proportion of skunks that were rabid when trapped by the County Public Health Department personnel during the previous two years. These data suggest that a rabies outbreak may have occurred in the skunk population and spread into the SJKF population. A similar time lag in disease transmission and subsequent population reduction was observed in Ontario, Canada, although in this instance the transmission was from red foxes to striped skunks (MacDonald and Voigt 1985).

Pesticides and rodenticides pose a threat to SJKFs through direct or secondary poisoning. SJKFs may be killed if they ingest a rodenticide in a bait application, or if they eat a rodent that has consumed the bait. Even a sublethal dose of a rodenticide may lead to the death of a SKKF by impairing its ability to escape predators or find food. Pesticides and rodenticides may also indirectly affect the survival of SJKFs by reducing the abundance of staple prey species. For example, the California ground squirrel, which is the staple prey of the SJKF in the northern portion of its range, was thought to have been eliminated from Contra Costa County in 1975, after extensive rodent eradication programs. Field observations indicated that the long-term use of ground squirrel poisons in this county severely reduced SJKF abundance through secondary poisoning and suppression of populations of its staple prey species (Orloff et al. 1986).

The SJKF occupies habitats adjacent to agricultural lands and is also likely to come into contact with insecticides applied to crops given runoff or aerial drift. SJKFs could be affected through direct contact with sprays and treated soils, or through consumption of contaminated prey. Data from the California Department of Pesticide Regulation indicate that acephate, aldicarb, azinphos methyl, bendiocarb, carbofuran, chlorpyrifos, endosulfan, s-fenvalerate, naled, parathion, permethrin, phorate, and trifluralin are used within one mile of SJKF habitat. A wide variety of crops (alfalfa, almonds, apples, apricots, asparagus, avocados, barley, beans, beets, bok choy, broccoli, cantaloupe, carrots, cauliflower, celery, cherries, chestnuts, chicory, Chinese cabbage, Chinese greens, Chinese radish, collards, corn, cotton, cucumbers, eggplants, endive, figs, garlic, grapefruit, grapes, hay, kale, kiwi fruit, kohlrabi, leeks, lemons, lettuce, melons, mustard, nectarines, oats, okra, olives, onions, oranges, parsley, parsnips, peaches, peanuts, pears, peas, pecans, peppers, persimmons, pimentos, pistachios, plums, pomegranates, potatoes, prunes, pumpkins, quinces, radishes, raspberries, rice, safflower, sorghum, spinach, squash, strawberries, sugar beets, sweet potatoes, Swiss chard, tomatoes, walnuts, watermelons, and wheat), as well as buildings, Christmas tree plantations, commercial/industrial areas, greenhouses, nurseries, landscape maintenance, ornamental turf, rangeland, rights-of-way, and uncultivated agricultural and non-agricultural land, occur in close proximity to SJKF habitat.

Efforts have been underway to reduce the risk of rodenticides to the SJKF (Service in litt. 1993). The Federal government began controlling the use of rodenticides in 1972 with a ban of Compound 1080 on Federal lands pursuant to Executive Order. Above-ground application of strychnine within the geographic ranges of listed species was prohibited in 1988. A July 28, 1992 biological opinion regarding the Animal Damage Control Program (now known as Wildlife Services) by the U.S. Department of Agriculture found that this program was likely to jeopardize the continued existence of the SJKF owing to the potential for rodent control activities to take the SJKF. As a result, several reasonable and prudent measures were implemented, including a ban

on the use of M-44 devices, toxicants, and fumigants within the recognized occupied range of the SJKF. Also, the only chemical authorized for use by the Wildlife Services within the occupied range of the SJKF was zinc phosphide, a compound known to be minimally toxic to the SJKF (Service 1992).

Despite these efforts, the use of other pesticides and rodenticides still pose a significant threat to the SJKF, as evidenced by the death of two SJKFs at Camp Roberts in 1992 owing to secondary poisoning from chlorophacinone applied as a rodenticide (Berry et al. 1992; Standley et al. 1992). Also, the livers of three SJKFs that were recovered by the City of Bakersfield during 1999 were found to contain detectable residues of the anticoagulant rodenticides chlorophacinone, brodifacoum, and bromadialone (CDFG 1999).

To date, no specific research has been conducted on the effects of different pesticide or rodent control programs on the SJKF (Service 1998). This lack of information is problematic because Williams (in litt. 1989) documented widespread pesticide use in known SJKF and Fresno kangaroo rat (*Dipodomys nitratoides exilis*) habitat adjoining agricultural lands in Madera County. In a separate report, Williams (in litt. 1989) documented another case of pesticide use near Raisin City, Fresno County, were treated grain was placed within an active Fresno kangaroo rat precinct. Also, farmers have been allowed to place bait on Reclamation property to maximize the potential for killing rodents before they entered adjoining fields (Biological Opinion for the Interim Water Contract Renewal, Ref. No. 1-100F-0056 February 29, 2000). A September 22, 1993 biological opinion for the Environmental Protection Agency (EPA) regarding the regulation of pesticide use (31 registered chemicals) through administration of the Federal Insecticide, Fungicide, and Rodenticide Act found that use of aluminum and magnesium phosphide fumigants, chlorophacinone anticoagulants, diphacinone anticoagulants, pival anticoagulants, potassium nitrate and sodium nitrate gas cartridges, and sodium cyanide capsules would likely jeopardize the continued existence of the SJKF (Service 1993). Reasonable and prudent alternatives to avoid jeopardy included restricting the use of aluminum and magnesium phosphides, and potassium and sodium nitrates within the geographic range of the SJKF to qualified individuals, and prohibiting the use of chlorophacinone, diphacinone, pival, and sodium cyanide within the geographic range of the SJKF, with certain exceptions (e.g., agricultural areas that are greater than one mile from any SJKF habitat) (EPA 1999). However, the EPA's position on the use of rodenticides within the geographic range of the SJKF is that rodent control compounds will have no adverse effects on the SJKF provided that the EPA registered compounds are applied with strict observance of EPA approved label restrictions (April 11, 2000, pers. comm.. from L. Turner, EPA, Washington, D.C., to V. Campbell, Service, Sacramento, California). However, even the minimal evidence provided above refutes this position.

Occurrence of vehicle strikes involving SJKFs have been well documented and such strikes occur throughout the range of the taxon. Sources of SJKF were examined during 1980 to 1995 at the Naval Petroleum Reserves in western Kern County (Cypher et al. 2000). During this period, 341 adult SJKFs were monitored using radio telemetry, and 225 of these individuals were found dead. Of the 225 carcasses recovered, 20 individuals were determined to have been struck by vehicles. During this same period, 184 juvenile SJKF (i.e., less than 1 year old) were monitored.

Of these SJKF, 142 individuals were found dead and 11 were determined to have been struck by vehicles. For both adult and juvenile SJKF, vehicles strikes accounted for less than 10 percent of all SJKF deaths in most years. However, in some years, roadway mortality accounted for up to 20 percent of all deaths.

In other areas of western Kern County, SJKFs were also radio-collared and monitored (49 individuals in the highly developed Midway-Sunset Oil Field and 54 individuals in the Lokern Natural Area) during 1989 to 1993 (Spiegel and Disney 1996). Of these SJKFs, 60 individuals were recovered dead and only one was determined to have been struck by a vehicle. However, six non-collared individuals were also found in this area and determined to have been struck by vehicles. Forty-one SJKFs were radio-collared and monitored during 1989 to 1991 on the Carrizo Plain Natural Area (Ralls and White 1995). Twenty-two individuals were found dead and only one death was attributed to roadway mortality. At Camp Roberts, 94 SJKFs were radio-collared and monitored during 1988 to 1992 (Standley et al. 1992). Forty-nine individuals were found dead, but only two deaths were attributed to vehicle strikes. In western Merced County, 28 SJKFs were radio-collared and monitored during 1985 to 1987 (Briden et al. 1992). Seventeen of these latter individuals were recovered dead and two deaths were determined to have been caused by vehicle strikes.

In the City of Bakersfield, 113 SJKFs were radio-collared and monitored during 1997 to 2000 (Cypher 2000). Thirty-five individuals were found dead. Twenty-three adults (39 percent) and 12 pups (50 percent) of these deaths were attributed to vehicle strikes. At this urban site, coyotes and bobcats are rare, and vehicles are the primary cause of SJKF mortality. However, survival rates are higher in this latter population than rates among SJKFs in non-urban areas, and roadway mortality does not appear to be limiting the population size.

The local and range-wide effect of roadway mortality on the SJKF has not been adequately assessed. Vehicle strikes appear to occur most frequently where roads traverse areas where SJKFs are abundant. However, the linear quantity of roads in a given area may not be directly related to the number of vehicle strikes in a given area, as exemplified by the situation at the Naval Petroleum Reserves. The type of road (e.g., number of lanes), traffic volume, and average speed of vehicles likely all influence the number of SJKF vehicle strikes. The number of strikes likely increases with road size, traffic volume, and average speed (Clevenger and Waltho 1999). Another factor influencing the number of vehicles striking SJKFs, but for which little data is available, is the frequency with which the taxon crosses a given road and exposes itself to risk. The proportion of successful road crossings by the taxon likely declines with road size, traffic volume and density, and vehicle speeds. In addition, the proportion of SJKFs successfully crossing roads may increase in areas where they obtain more experience crossing roads such as in and near urban areas.

Increases in ambient noise level are unlikely to cause direct harm to SJKFs, though no specific research in regards to this issue has been conducted on the SJKF. However, the enlarged pinna and reduced tragic of the SJKF suggest that hearing is more acute in the taxon than in humans. Furthermore, a "safe, short-term level" for humans has been determined to be approximately 75 decibles (dBA) (NIH 1990; Burglund and Lindvall 1995). Variation in response to intense noise

has been found to vary in humans by as much as 30 to 50 dBA between individuals (NIH 1990). Similar variation has been found in animal studies (NIH 1990). In addition, the ability to habituate to noise appears to vary widely between species (NPS 1990). Typical construction machinery produces noise in the range of 75 dBA (arc-welder) to 85 dBA (bulldozer) (Burglund and Lindvall 1995). Long-term noise levels of 85 dBA have been found to cause permanent hearing loss in humans (NIH 1990). Noise at the 85 dBA level has also been correlated with hypertension in Philippine cynomolgus monkeys (*Macaca fasicularis*) (Comman 2001). Increased reproductive failure in laboratory mice (*Mus musculus*) was found to occur after a level of 82 to 85 dBA for one week (Comman 2001). However, measurable loss of hearing was found to occur in chinchillas (*Chinchilla laniger*) at a sustained level of 70 dBA (Peters 1965). Hearing loss from motorcycle traffic has been documented for kangaroo rats (*Dipodomys* spp.) (Bondello and Brattstrom 1979). Furthermore, desert kangaroo rats (*Dipodomys deserti*) showed a significant reduction in reaction distance to the sidewinder (*Crotalus cerastes*) after exposure to 95 dBA (Comman 2001). Other desert mammals appear to sustain similar impacts from noise (Bondello and Brattstrom 1979).

California condors (*Gymnogyps californianus*) have been shown to abandon nesting sites in response to vehicle noise (Shaw 1970). Grizzly bears (*Ursus arctos*), mountain goats (*Oreamnos canadensis*), caribou (*Rangifer* spp.), and bighorn sheep (*Ovis* spp.) have all been found to abandon foraging or calving areas in response to aircraft noise (Chadwick 1973; McCourt et al. 1974; Ballard 1975; Krausman and Hervert 1983; Gunn et al. 1985; Bleich 1990). Consequently, harassment from long-term noise may also cause SJKFs and their prey species to vacate an area. However, observations from a variety of sources also suggest that SJKFs may not be significantly affected by disturbance (including noise), even when the source is prolonged or continuous (Cypher 2000).

Historically, the SJKF may have existed in a metapopulation structure of core and satellite populations, some of which periodically experienced local extinction and recolonization (Service 1998). Today's populations exist in an environment drastically different from the historic situation and extensive fragmentation results in geographic isolation (e.g., loss of movement corridors), smaller population sizes, and reduced genetic exchange among populations, all of which increase the vulnerability of SJKF populations to extinction. Populations of SJKF are extremely susceptible to the risks associated with small population size and isolation because they are characterized by marked instability in population density. For example, the relative abundance of SJKF at the Naval Petroleum Reserves decreased 10-fold during 1981 to 1983, increased 7-fold during 1991 to 1994, and then decreased 2-fold during 1995 (Cypher and Scrivner 1992, Cypher and Spencer 1998).

Many populations of SJKF are at risk of extinction owing to small population size and isolation. This risk has been prominently illustrated during recent, drastic declines in the populations of SJKF at Camp Roberts and Fort Hunter Liggett. Captures of SJKF during annual livetrapping sessions at Camp Roberts decreased from 103 to 20 individuals during 1988 to 1991. This decrease continued through 1997 when only three SJKF were captured (White et al. 2000). A similar decrease in SJKF abundance occurred at nearby (approximately 20 km) Fort Hunter Liggett where only two SJKFs have been reported since 1995 (L. Clark, Wildlife Biologist, Fort

Hunter Liggett, pers. comm.. to P. White, Fish and Wildlife Service, Sacramento, February 15, 2000). It is unlikely that the current low abundance of SJKF at Camp Roberts and Fort Hunter Liggett will increase substantially in the near future owing to the limited potential for recruitment. The chance of substantial immigration is low because the nearest core population on the Carrizo Plain is distant (greater than 80 km) and separated from these installations by barriers to SJKF movement such as roads, developments, and irrigated agricultural areas. Also, there is a relatively high abundance of sympatric predators and competitors on these installations that contribute to low survival rates for SJKF, and as a result may limit population growth (White et al. 2000). Hence, these populations may be on the verge of extinction.

The destruction and fragmentation of habitat could also eventually lead to reduced genetic variation in populations of SJKFs that are small and geographically isolated. Historically, SJKFs likely existed in a metapopulation structure of core and satellite populations, some of which periodically experienced local extinction and recolonization (Service 1998). Preliminary genetic assessments indicate that historic gene flow among populations was quite high, with effective dispersal rates of at least 1 to 4 dispersers per generation (M. Schwartz, University of Montana, Missoula, pers. comm.. on March 23, 2000 to P. White, Fish and Wildlife Service, Sacramento, California). This level of genetic dispersal should allow for local adaptation while preventing the loss of any rare alleles. Based on these results, it is likely that northern populations of SJKF were once panmictic (i.e., randomly mating in a genetic sense), or nearly so, with southern populations. As such, there were no major barriers to dispersal among populations. Current levels of gene flow also appear to be adequate. However, extensive habitat loss and fragmentation continue to form more or less geographically distinct populations of SJKFs, which could potentially reduce exchange between populations. An increase in inbreeding and the loss of genetic variation could increase the risk of extirpation for small, isolated populations of SJKFs by interacting with demography to reduce fecundity, juvenile survival, and lifespan (Lande 1988; Frankham and Ralls 1998; Saccheri et al. 1998). One area of particular concern is Santa Nella in western Merced County where pending development plans threaten to eliminate the little suitable habitat that remains and provides a dispersal corridor for SJKF between the northern and southern portions of its range. Preliminary estimates of expected heterozygosity from SJKFs in this area indicate that this population may already have reduced genetic variation. Other populations that may be showing the initial signs of genetic isolation are associated with the Lost Hills area and Salinas-Pajaro River watershed (which include Camp Roberts and Fort Hunter Liggett). Preliminary estimates of the mean number of alleles per locus from SJKFs in these populations indicate that allelic diversity is lower than expected. Although these results may, in part, be due to the small number of SJKFs sampled in these areas, they may also be indicative of an increase in the amount of inbreeding due to population subdivision (M. Schwartz, University of Montana, Missoula, pers. comm.. on March 23, 2000 to P. White, Fish and Wildlife Service, Sacramento, California). Further sampling and analyses are necessary to adequately assess the effects of these potential genetic bottlenecks.

Arid systems are characterized by unpredictable fluctuations in precipitation, which lead to high frequency, high amplitude fluctuations in the abundance of mammalian prey for SJKFs (Williams and Germano 1992; Goldingay et al. 1997; White and Garrott 1998; Cypher et al. 1992). Because the reproductive and neonatal survival rates of SJKFs are strongly depressed at

low prey densities (White and Ralls 1993, White and Garrott 1997, 1999), periods of prey scarcity owing to drought or excessive rain events can contribute to population crashes and marked instability in the abundance and distribution of SJKFs (White and Garrott 1999). In other words, unpredictable, short-term fluctuations in precipitation and, in turn, prey abundance can generate frequent, rapid decreases in SJKF density that increase the risk of extinction for small, isolated populations.

A dead SJKF was found approximately 1 mile southeast of the Grantland Avenue exit on State Route 99 approximately 15 miles southwest of the southern-most portion of the action area in 1993 (CDFG 2007). This latter occurrence is within a broad movement corridor for the taxon on the east side of the San Joaquin Valley that has been identified in studies that support the Recovery Plan for Upland Species of the San Joaquin Valley, California (Service 1998). In addition, SJKFs may move 9 miles or more in a single night (Service 1998). Suitable habitat is found on and adjacent to the project site. Such suitable habitat consists of annual grassland and oak savannah. Therefore, given the ecology of the taxon, presence of suitable habitat on and adjacent to the project site, and records within the project vicinity, the SJKF may inhabit the action area of the proposed project.

San Joaquin Kit Fox Critical Habitat

Critical habitat for SJKF has not been designated or proposed.

Environmental Baseline

Valley Elderberry Longhorn Beetle

Field assessments of the action area were conducted by North State Resources, Inc. (NSR) biologists on March 4-5, April 9-11, and May 19-21, 2003. During these field assessments, all areas within the action area were visually inspected for the presence of elderberry shrubs. A total of seven elderberry shrubs were identified within the action area during the field assessments. On January 29, 2004, NSR biologists inspected the seven elderberry shrubs for evidence of VELB and collected additional information in accordance with the survey guidelines set forth in the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Service 1999).

During the January 2004 survey, the elderberry shrubs were flagged, assigned a number, and located using a Pathfinder Pro Global Positioning System (GPS) capable of sub-meter accuracy. For each elderberry shrub, all live stems measuring 1 inch or greater in diameter at ground level were counted, assessed for the presence of VELB exit holes, and assigned to a size class (i.e., stems 1-3 inches, 3-5 inches, and greater than 5 inches). Native woody vegetation occurring in the immediate vicinity was also recorded. The results of the January 2004 field survey are presented in Table 1.

The field survey determined that the seven elderberry shrubs comprise a total of 24 live stems equal to or greater than 1 inch in diameter at ground level. No exit holes attributable to the VELB (i.e., circular or slightly oval, and 7-10 mm in diameter) were observed on any of the

stems. However, larval galleries of the VELB can be found in stems with no evidence of exit holes (Barr 1991; Service 1996).

Few VELB have been reported in the immediate vicinity of the proposed project. According to California Natural Diversity Data Base (CNDDB; 2008), the nearest reported sighting was about 10 miles away, 11 miles south of the community of Oakhurst (Occurrence Number 120), while another reported sighting was located about 17 miles south, near the community of Pinedale (Occurrence Number 135).

California Tiger Salamander

Bumgardner Biological Consulting conducted an on-site biological resources assessment on January 29, 2004, that addressed the potential for CTS to occur within the boundaries of the proposed Madera Quarry and associated 1.2-mile Road 209 road realignment corridor (i.e., right-of-way). The January 31, 2004, biological resources assessment identifies that there are no suitable aquatic sites within 0.6 miles of the mine site boundaries that could be used by CTS as breeding ponds since all ponds within 0.6 miles are perennial ponds with evidence of introduced predatory fishes (frequently an exclusionary criteria for CTS). Furthermore, the biological resources assessment identifies that there are no documented CTS breeding ponds within less than 1.3 miles (with the exception of a single pond located approximately 0.7 miles north of the site where CTS larvae were last documented in 1973). However, given that this latter pond is separated from the site by a steep, rocky ridge and is 0.7 miles away, the biological resources assessment determined it is unlikely that individuals would use the terrestrial habitat within the mine site (i.e., move between the mine site and pond). Therefore, no appropriate combination of suitable aquatic and terrestrial habitat on or immediately adjacent to the mine site that would support a population of CTS occurs within the mine site boundaries. Nonetheless, additional assessment was conducted by BBC within the aquatic habitats that are within 1.3 miles of the mine site and to which legal access could be obtained to address comments made by the California Department of Fish and Game (CDFG) on the Draft Environmental Impact Report (DEIR) for the Madera Ranch Quarry (CDFG 2005).

Seven perennial ponds are located within 1.3 miles of the mine site boundaries based on review of aerial photography for the area. Six of these ponds were surveyed on November 16 and 17, 2005, by BBC to identify evidence of other species in these ponds that would preclude occupation by CTS (Table 2). These reconnaissance-level surveys determined that all of the ponds have substantial populations of bullfrogs. Furthermore, many of the ponds have populations of mosquito fish that were likely introduced by the local county mosquito abatement district. Though no direct evidence of introduced predatory fishes was obtained during these latter surveys, the presence of bullfrogs (particularly in extremely large numbers) and mosquito fish suggest that a breeding population of CTS would not persist in these ponds since both species have been implicated in the extirpation of CTS from known aquatic breeding sites. Nonetheless, additional surveys were conducted by Mr. Cal Tatum (National Bass West, fisheries consultant) at the request of BBC on November 26 and 27 and December 30, 2005, to document presence of introduced predatory fishes in the ponds. This latter survey consisted of establishing baited throw-lines and jug-lines in each pond to capture predatory fishes (if present). The surveys

found direct evidence of introduced predatory fishes in six of the seven perennial ponds (i.e., live individuals) and indirect evidence in the last pond (old bass spawning beds). Thus, the available evidence suggests that none of the ponds within 1.3 miles of the mine site (including the pond 0.7 miles to the north that was previously documented to contain CTS) is considered suitable as aquatic breeding habitat for CTS.

It should be noted that the project description was amended after the January 31, 2004, biological resources assessment was prepared to include roadway realignment all the way to the confluence with State Route 41. Therefore, the lower 3.2 miles of proposed roadway improvements on Road 209 were not addressed by the original biological resources assessment. Consequently, the biological resources assessment conducted by BBC on November 16 and 17, 2005, also evaluated the potential for CTS to be affected by the southern-most 3.2 miles of proposed roadway improvements. This latter assessment found no evidence of known CTS breeding ponds within 1.3 miles of the proposed roadway improvements based on occurrences reported to the CNDDB (2005). Two ponds within 1.3 miles of the southern-most proposed roadway improvements were identified from aerial photography of the area. However, these ponds are on private lands to which access could not be obtained. Nonetheless, the habitat located south of a point approximately 2.4 miles south of the mine entrance changes from rolling oak woodland to a relatively flat vernal pool/swale landscape. Therefore, there may be vernal pools located within this landscape that could be used as breeding ponds by CTS, but that would not be apparent from the aerial photography. Forty-five occurrences of CTS have been documented for Madera County in the California Natural Diversity Data Base (CNDDB 2005, 2008). According to CNDDB (2008), the nearest reported record is immediately adjacent to the proposed project site along Road 406 (Occurrence Number 90), while others have been reported from the O'Neals Experimental Range (about 2 miles to the northeast; e.g., Occurrence Number 62) and approximately 5 miles to the south (Occurrence Numbers: 73, 74, 94, 164, 222, 223, 319, 320, 614, 733, 735, and 904). With one exception, all of these occurrences are below 1,200 feet in elevation. In addition, unlike other portions of California where CTS are now often restricted to breeding in artificial ponds (e.g., bermed or stock ponds), many of the occurrences in Madera County are associated with vernal pools. Consequently, occupied but currently unknown CTS breeding sites (i.e., vernal pools) may occur in the vicinity of Road 209 and CTS may occur in the terrestrial habitat (i.e., vernal pool grassland) located within and adjacent to the right-of-way of Road 209. Furthermore, CTS may occur to the north in terrestrial habitat (i.e. annual grassland and oak savannah) in the vicinity of the mine site even though no suitable or occupied breeding sites have been found in this area if occupied but currently unknown CTS breeding sites exist in the area.

San Joaquin Kit Fox

No focused surveys for SJKF were conducted on or near the action area of the proposed project. In addition, no information in regards to the presence or distribution of the taxon in the project vicinity was provided in the Biological Assessment for the proposed project. However, an occurrence of SJKF has been documented along State Route 99 approximately 15 miles southwest of the action area (CDFG 2007). Furthermore, the Service has identified the interface between the floor of the San Joaquin Valley and Sierra Nevada foothills as an important

movement corridor for the SJKF in the recovery plan that addresses the taxon (Service 1998). The above occurrences and assessment indicate that the SJKF may occur in the action area.

Table 2: Result of Studies Conducted in Ponds Near the Proposed Madera Quarry.

Pond No.	Survey/Study Results
1	bullfrogs (extremely large number estimated at 400+ individuals); no direct evidence of gamefish, but apparent black bass spawning beds were observed
2	bullfrogs (extremely large number estimated at 500+ individuals); mosquito fish (large number of individuals); black bass; and fish-eating birds (e.g., common merganser, hooded merganser, belted kingfisher)
3	bullfrogs (large number estimated at 100+ individuals); mosquito fish; and bluegill
4	bullfrogs (extremely large number estimated at 500+ individuals); mosquito fish (large number of individuals); and bluegill
5	bullfrogs (extremely large number estimated at 200+ individuals) and fish-eating birds (e.g., pied-billed grebe)
6	bullfrogs (extremely large number estimated at 300+ individuals) and fish-eating birds (e.g., pied-billed grebe)
7	bullfrogs (small number); black bass and bluegill (large numbers)

Effects of the Proposed Action

Valley Elderberry Longhorn Beetle

The proposed action would result in the removal and relocation of seven elderberry shrubs (and the 24 associated live stems equal to or greater than 1 inch in diameter at ground level).[3] All of these shrubs have stems greater than 1 inch in diameter at ground level and therefore may be occupied by the VELB. Since VELB larvae and pupae occur exclusively within elderberry stems, it is not possible to quantify the exact number of individuals that could be taken as a result of the removal and relocation of the seven elderberry shrubs. Consequently, the level of take is expressed as the number of shrubs (and stems greater than 1 inch in diameter at ground level) being removed and transplanted. Furthermore, all VELB larvae or pupae occupying the seven elderberry shrubs are assumed to be adversely affected during or after the removal and relocation process. Adverse effects to the species may include: (1) direct mortality of larvae or pupae; (2) interruption of the species' life cycle; (3) reduced habitat quality of the shrub for larvae and

3 The initial elderberry shrub surveys were conducted in 2003 and 2004. Given that survey results are valid for only 2 years for purposes of consultation under the Act, the effects described here may no longer be valid. On the other hand, given the proactive and cooperative nature of the discussions between the project proponent and the Service, the Service is willing to allow up to 10% additional effects without the need to revise the current biological opinion. Prior to groundbreaking, however, the Service recommends that elderberry surveys be repeated and that, if warranted, this document be amended.

pupae when branches are cut, broken, or crushed as a result of the removal and relocation process; and (4) reduced habitat quality of the relocated shrub for larvae and pupae due to stresses associated with changes in soil, hydrology, microclimate, or associated vegetation. The removal and relocation process may also impair the shrub's future production of habitat-quality stems or result in the death of the shrub (ceasing to provide habitat for the VELB).

California Tiger Salamander

The proposed action may result in a number of adverse effects to CTS. Mining activities could result in the entombment or crushing of an unknown number of CTS in small burrows within the mine site. Furthermore, individuals that are exposed on the surface during removal of overburden may be injured or subjected to increased predation or desiccation. Individuals could also fall into pits, trenches, or other excavations and be killed directly or indirectly (through desiccation, entombment, or starvation).

Mining activities would also result in the permanent loss of up to 120.9 acres of suitable habitat (i.e., non-native grassland and oak savannah). This loss of habitat would involve removal of potential refugia associated with small mammal burrows and landscape that CTS may travel over during migration and dispersal.

The construction activities associated with the realignment of Road 209 could result in the entombment or crushing of an unknown number of CTS located in small mammal burrows within the ROW. In addition, individuals that are exposed on the surface during excavation or grading within the ROW may also be injured or subjected to increased predation or desiccation. Individuals could also fall into pits, trenches, or other excavations and be killed directly or indirectly (through desiccation, entombment, or starvation). Individuals could become entangled if plastic mono-filament netting is used for erosion control and then be subject to predation, starvation, or desiccation (Stuart *et al.* 2001). CTS within the Road 209 ROW could also be subject to increased levels of harassment due to the use of artificial lighting during night construction activities (Wise and Buchanan 2002).

Realignment and widening of Road 209 would also result in the permanent loss of approximately 14.6 acres of suitable upland habitat (i.e., non-native grassland). This loss of habitat would involve removal of potential refugia associated with small mammal burrows and landscape that CTS may travel over during migration and dispersal. The area directly affected would be associated with the extension of pavement and other associated ground disturbance over the 4.4 miles of proposed roadway improvement between the haul road and intersection of State Route 41 and County Road 209. It should be noted that the calculation of 14.6 acres of permanent habitat loss associated with the roadway improvements was determined using computer aided design (CAD) analysis of the design footprint (including cut and fill, new pavement, and shoulder extension).

The increased width of the road and higher levels of vehicle traffic could also be expected to result in greater mortality of CTS that are moving to or from breeding ponds. However, hauling operations would be limited to the period from 30 minutes after sunrise to 30 minutes before

sunset during December 1 to February 28 (i.e., the season when most adults would be moving to and from the breeding ponds). Therefore, there would be no expected increase in the number of CTS mortalities during this time of the year due to the hauling operations associated with the mine. The timing of juvenile dispersal away from the breeding ponds is more difficult to predict since it is based on when individual breeding ponds dry and the timing of this event can vary considerably from year to year. However, typical mine and hauling operations would normally be finished for the day by 7:00 pm. during late spring to summer (when metamorphs would typically be dispersing away from their natal ponds). Therefore, increased roadway mortality during juvenile dispersal would not be expected during normal operations since individuals would not move until after dark (an hour or more after hauling operations have ceased for the day). Hauling operations would only have the potential to affect dispersing juvenile CTS during the occasional contract that requires night-time delivery of the mine's products.

There are no potential breeding ponds for CTS within the mine site or Road 209 ROW. Therefore, mining and roadway realignment activities would have no direct effect on CTS breeding ponds. In addition, no measurable effects to CTS breeding habitat outside the mine site or road ROW are expected since the applicant would be required to comply with all BMPs and other measures required in the storm water pollution prevent plan (SWPPP) for the proposed project. Thus, no contaminants (including significant sedimentation) would be expected to reach and adversely affect potential breeding ponds outside the mine site or road ROW.

Although roadways can fragment CTS habitat, the proposed roadway realignment is expected to contribute minimally to habitat fragmentation in the vicinity of Road 209. The roadway already exists and does not preclude movement by CTS (e.g., due to non-negotiable curbs or other structures). Nor would the road preclude movement by the species once the realignment is completed. Therefore, the roadway improvements would not isolate any habitat that could by used by the species. The increase in average daily trips (ADT) on Road 209 could be expected to result in an incremental increase in roadway mortality of migrating and dispersing individuals as discussed above, but the potential effects of this roadway mortality (e.g., reduced gene flow and ability to recolonize areas where the species has been extirpated) is unlikely to have more than a negligible effect in such a large complex of suitable habitat (i.e., several thousand acres of surrounding vernal pool grassland).

San Joaquin Kit Fox

The proposed action may result in a number of adverse effects to SJKF. Mining activities could result in the entombment, crushing, or injury of an unknown number of SJKF in burrows or dens within the mine site. Individuals could also fall into pits, trenches, or other excavations and be killed directly or indirectly (through injury, starvation, dehydration, or predation). Individuals may also be killed by predators attracted to food or trash left at the mine site. Removal of vegetation and soils at the mine site and creation of the quarry pit may affect SJKF movement in the project vicinity if established movement corridors are dissected. Mining activities could also affect SJKF that occur in the project vicinity through disruption of normal SJKF foraging or social behaviors or the activities of staple prey species from noise and lighting.

Mining activities would also result in the permanent loss of up to 120.9 acres of suitable habitat (i.e., non-native grassland and oak savannah). This loss of habitat would result in removal of foraging habitat, reduction in associated prey populations, and loss of potential den sites.

The construction activities associated with the realignment of Road 209 could result in the entombment or crushing of an unknown number of SJKF located in burrows or dens within the ROW. In addition, individuals could fall into pits, trenches, or other excavations and be killed directly or indirectly (through injury, starvation, dehydration, or predation). SJKF within the Road 209 ROW could also be subject to increased levels of harassment due to the use of artificial lighting during night construction activities.

Realignment and widening of Road 209 would also result in the permanent loss of approximately 14.6 acres of suitable upland habitat (i.e., non-native grassland). This loss of habitat would result in removal of foraging habitat, reduction in associated prey populations, and loss of potential den sites. The area directly affected would be associated with the extension of pavement and other associated ground disturbance over the 4.4 miles of proposed roadway improvement between the haul road and intersection of State Route 41 and County Road 209.

Roadway improvements may also facilitate the invasion and establishment of non-native plant species. Some of these taxa are aggressively invasive, can alter natural vegetation communities, and may affect wildlife habitat quality. A problematic species within the range of the SJKF is yellow star-thistle (*Centaurea solstitialis*). Dense stands of this plant can form along roadsides and spread into adjacent habitat. The plant displaces native vegetation, competes with native plants for resources, does not appear to be used by the SJKF's staple prey species, occurs in dense stands, and may be difficult for SJKFs to move through due to its large size (up to 1 meter tall) and numerous sharp spines (Cypher 2000).

The increased width of the road and higher levels of vehicle traffic could also be expected to result in greater mortality of SJKF. Though hauling operations would be limited to the period from 30 minutes after sunrise to 30 minutes before sunset during December 1 to February 28 and typical mine and hauling operations would normally be finished for the day by 7:00 pm during the remainder of the year, the proposed project could result in increased traffic during the normal activity period of the SJKF (i.e., after sunset). Overlap between SJKF activity and hauling operations could occur during October to November (i.e., when the 7:00 pm mine operations termination time can occur up to two hours after sunset). Therefore, increased roadway mortality may occur during normal mining and hauling operations. Furthermore, mining and hauling operations may extend to later hours with the occasional contract that requires night-time delivery of the mine's products. The chance of roadway mortalities would increase during such operations.

Although roadways can fragment SJKF habitat, the proposed roadway realignment is expected to contribute minimally to habitat fragmentation in the vicinity of Road 209. The roadway already exists and does not preclude movement by SJKF. Nor would the road preclude movement by the taxon once the realignment is completed. Therefore, the roadway improvements would not isolate any habitat that could be used by the species. The increase in average daily trips (ADT)

on Road 209 could be expected to result in an increase in roadway mortality of SJKF as discussed above, but the potential effects of this roadway mortality (e.g., reduced gene flow and ability to recolonize areas where the species has been extirpated) is unlikely to have more than a negligible effect in such a large complex of suitable habitat (i.e., several thousand acres of surrounding annual grassland).

Cumulative Effects

Cumulative effects are those effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The Service has not identified other projects or actions currently under review by State, county, and local authorities within the action area that would affect the VELB, CTS, or SJKF. Such projects could include urban expansion, other road improvement projects, creek channelization, and agricultural conversions of rangeland. Consequently, no cumulative effects for these species are identified within the action area of the proposed project.

Conclusion

After assessing the current status of the VELB, CTS, and SJKF environmental baselines for the action area, effects of the proposed action, and cumulative effects, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the VELB, CTS, or SJKF. Critical habitat has not been designated or proposed for the SJKF. Critical habitat has been designated for the VELB and CTS. However, this action does not affect any designated critical habitat unit and no destruction or adverse modification of critical habitat would therefore occur.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited

taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the U.S. Army Corps of Engineers (Corps) so that they become binding conditions of any grant or permit issued to an applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate activities covered by this incidental take statement. If the Corps: (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

Valley Elderberry Longhorn Beetle

The Service anticipates that incidental take of the VELB will be difficult to detect for the following reasons: (1) the relatively small body size makes the finding of a dead specimen unlikely; (2) the secretive nature of the species; (3) losses may be masked by seasonal fluctuations in numbers or other causes; and (4) the species occurs in a habitat (woody interior of elderberry shrubs) that makes it difficult to detect. For these reasons, the Service anticipates that all VELB larvae and pupae will be taken in conjunction with the removal and relocation of seven elderberry shrubs (and the 24 associated live stems equal to or greater than 1 inch in diameter at ground level).[4] This incidental take is expected to be in the form of harm, harassment, capture, injury, and mortality to VELB larvae and pupae from removal and relocation of occupied elderberry shrubs. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Madera Quarry mining operations in the form of harm, harassment, capture, injury, and mortality to VELB larvae and pupae from removal and relocation of occupied elderberry shrubs will become exempt from prohibitions described under section 9 of the Act.

California Tiger Salamander

The Service anticipates that incidental take of the CTS will be difficult to detect for the following reasons: (1) when this amphibian is not at its breeding ponds, or foraging, migrating, dispersing, or conducting other surface activity, it inhabits the burrows of ground squirrels or other rodents; (2) occupied burrows may be located relatively long distances from breeding ponds; (3) dispersal and migration occurs during limited periods on rainy or humid nights during fall, winter, or spring; and (4) its relatively small body size hinders finding injured or dead individuals. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or other environmental disturbances. For these reasons, the Service anticipates that all adult and juvenile

4 See previous footnote. The Service is willing to allow up to 10% additional take at this time, given that elderberry shrub surveys are repeated prior to groundbreaking and that, if warranted, additional shrubs are relocated and plantings and seedlings are planted, per the guidelines.

CTS will be taken in conjunction with the permanent loss of 135 acres of the species' upland habitat. This incidental take is expected to be in the form of harm, harassment, capture, trap, injury, and mortality to adult and juvenile CTS from loss and modification of upland habitat, construction-related disturbance, and maintenance and operation activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Madera Quarry mining operations in the form of harm, harassment, capture, trap, injury, and mortality to adult and juvenile CTS from loss and modification of upland habitat, construction-related disturbance, and maintenance and operation activities will become exempt from prohibitions described under section 9 of the Act.

San Joaquin Kit Fox

The Service anticipates that incidental take of the SJKF will be difficult to detect or quantify for the following reasons: (1) when this mammal is not foraging, mating, or conducting other surface activity, it takes refuge in dens or burrows; (2) it may range over a large territory; (3) it is primarily active at night; (4) it is a highly intelligent animal that typically avoids humans; (5) it occurs in low population densities in the eastern San Joaquin Valley; and (6) its relatively small body size hinders finding injured or dead individuals. For these reasons, the Service anticipates that all adult and juvenile SJKF will be taken in conjunction with the permanent loss of 135 acres of the species' habitat. This incidental take is expected to be in the form of harm, harassment, capture, trap, injury, and mortality to adult and juvenile SJKF from loss and modification of suitable habitat, construction-related disturbance, and maintenance and operation activities. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Madera Quarry mining operations in the form of harm, harassment, capture, trap, injury, and mortality to adult and juvenile SJKF from loss and modification of suitable habitat, construction-related disturbance, and maintenance and operation activities will become exempt from prohibitions described under section 9 of the Act.

Effect of the Take

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the VELB, CTS, and SJKF. Critical habitat for the SJKF has not been designated or proposed. Therefore, none will be affected by the proposed project. Critical habitat has been designated for the VELB and CTS. However, none is located in the action area. Therefore, none will be affected by the proposed project.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the effects of the Madera Quarry mining operations on the VELB, CTS, and SJKF.

Valley Elderberry Longhorn Beetle

1. Take in the form of harassment or harm of the VELB during construction activities and implementation of the proposed project shall be minimized.

2. Effects of permanent losses and degradation of habitat of the VELB shall be minimized and, to the greatest extent practicable, habitat restored.

California Tiger Salamander

3. Take in the form of harassment or harm of the CTS during construction activities and implementation of the proposed project shall be minimized.

4. Effects of permanent losses and degradation of habitat of the CTS shall be minimized and, to the greatest extent practicable, habitat restored or compensated.

San Joaquin Kit Fox

5. Take in the form of harassment or harm of the SJKF during construction activities and implementation of the proposed project shall be minimized.

6. Effects of permanent losses and degradation of habitat of the CTS shall be minimized and, to the greatest extent practicable, habitat restored or compensated.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Corps must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary:

1. The following terms and conditions implement reasonable and prudent measures number one (1) and two (2):

   a. Comply with the terms and conditions of the Programmatic Formal Consultation Permitting Projects with Relatively Small Effects on the Valley Elderberry Longhorn Beetle Within the Jurisdiction of the Sacramento Field Office, California (Corps File #199600065) (provided below).

   b. Complete avoidance (i.e., no adverse effects) may be assumed when a 100-foot (or wider) buffer is established and maintained around elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level. Firebreaks may not be included in the buffer zone. In buffer areas construction-related disturbance should be minimized, and any damaged area should be promptly restored following construction. The Service must be consulted before any disturbances within the buffer area are considered. In addition, the Service must be provided with a map identifying the avoidance area and written details describing avoidance measures.

c. Fence and flag all areas to be avoided during construction activities. In areas where encroachment on the 100-foot buffer has been approved by the Service, provide a minimum setback of at least 20 feet from the dripline of each elderberry shrub.

d. Brief contractors on the need to avoid damaging the elderberry shrubs and the possible penalties for not complying with these requirements.

e. Erect signs every 50 feet along the edge of the avoidance area with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs should be clearly readable from a distance of 20 feet, and must be maintained for the duration of construction.

f. Instruct work crews about the status of the VELB and the need to protect its elderberry host plant.

g. Restore any damage done to the buffer area (area within 100 feet of elderberry shrubs) during construction. Provide erosion control and re-vegetate with appropriate native plants.

h. Buffer areas must continue to be protected after construction from adverse effects of the project. Measures, such as fencing, signs, weeding, and trash removal, are usually appropriate.

i. No insecticides, herbicides, fertilizers, or other chemicals that might harm the VELB or its host plant should be used in the buffer areas, or within 100 feet of any elderberry shrub with one or more stems measuring 1 inch or greater in diameter at ground level.

j. The applicant must provide a written description to the Service before groundbreaking of how the buffer areas are to be restored, protected, and maintained after construction is completed.

k. Mowing of grasses/ground cover may occur from July through April to reduce fire hazard. No mowing should occur within 5 feet of elderberry shrub stems. Mowing must be done in a manner that avoids damaging plants (e.g., stripping away bark through careless use of mowing/trimming equipment).

l. Elderberry shrubs must be transplanted if they can not be avoided by the proposed project. All elderberry shrubs with one or more stems measuring 1 inch or greater in diameter at ground level must be transplanted to a conservation area. At the Service's discretion, a shrub that is unlikely to survive transplantation because of poor condition or location, or a shrub that would be extremely difficult to move

because of access problems, may be exempted from transplantation. In cases where transplantation is not possible the minimization ratios in Table 1 may be increased to offset the additional habitat loss.

m. Trimming of elderberry shrubs (e.g., pruning along roadways, bike paths, or trails) with one or more stems 1 inch or greater in diameter at ground level, may result in take of VELB. Therefore, trimming is subject to appropriate minimization measures as outlined in Table 1.

n. A qualified biologist (monitor) must be on-site for the duration of the transplanting of the elderberry shrubs to insure that no unauthorized take of the VELB occurs. If unauthorized take occurs, the monitor must have the authority to stop work until corrective measures have been completed. The monitor must immediately report any unauthorized take of the VELB or its habitat to the Service and to the California Department of Fish and Game.

o. Transplant elderberry shrubs when the plants are dormant, approximately November through the first two weeks in February, after they have lost their leaves. Transplanting during the non-growing season will reduce shock to the shrub and increase transplantation success.

p. Transplanting Procedure: (i.) Cut the shrub back 3 to 6 feet from the ground or to 50 percent of its height (whichever is taller) by removing branches and stems above this height. The trunk and all stems measuring 1.0 inch or greater in diameter at ground level should be replanted. Any leaves remaining on the shrub should be removed. (ii.) Excavate a hole of adequate size to receive the transplant. (iii.) Excavate the shrub using a Vemeer spade, backhoe, front end loader, or other suitable equipment, taking as much of the root ball as possible, and replant immediately at the conservation area. Move the shrub only by the root ball. If the shrub is to be moved and transplanted off site, secure the root ball with wire and wrap it with burlap. Dampen the burlap with water, as necessary, to keep the root ball wet. Do not let the roots dry out. Care should be taken to ensure that the soil is not dislodged from around the roots of the transplant. If the site receiving the transplant does not have adequate soil moisture, pre-wet the soil a day or two before transplantation. (iv.) The planting area must be at least 1,800 square feet for each elderberry transplant. The root ball should be planted so that its top is level with the existing ground. Compact the soil sufficiently so that settlement does not occur. As many as five (5) additional elderberry plantings (cuttings or seedlings) and up to five (5) associated native species plantings (see below) may also be planted within the 1,800 square foot area with the transplant. The transplant and each new planting should have its own watering basin measuring at least three (3) feet in diameter. Watering basins should have a continuous berm measuring approximately eight (8) inches wide at the base and six (6) inches high. (v.) Saturate the soil with water. Do not use fertilizers or other supplements or paint the tips of stems with pruning substances, as the

effects of these compounds on the VELB are unknown. (vi.) Monitor to ascertain if additional watering is necessary. If the soil is sandy and well-drained, shrubs may need to be watered weekly or twice monthly. If the soil is clayey and poorly-drained, it may not be necessary to water after the initial saturation. However, most transplants require watering through the first summer. A drip watering system and timer is ideal. However, in situations where this is not possible, a water truck or other apparatus may be used.

q. Each elderberry stem measuring one inch or greater in diameter at ground level that is adversely affected (i.e., transplanted or destroyed) must be replaced, in the conservation area, with elderberry seedlings or cuttings at a ratio ranging from 1:1 to 8:1 (new plantings to affected stems). Minimization ratios are listed and explained in Table 1. Stock of either seedlings or cuttings should be obtained from local sources. Cuttings may be obtained from the plants to be transplanted if the project site is in the vicinity of the conservation area. If the Service determines that the elderberry shrubs on the proposed project site are unsuitable candidates for transplanting, the Service may allow the applicant to plant seedlings or cuttings at higher than the stated ratios in Table 1 for each elderberry plant that cannot be transplanted.

r. Studies have found that the VELB is more abundant in dense native plant communities with a mature overstory and a mixed understory. Therefore, a mix of native plants associated with the elderberry shrubs at the project site or similar sites will be planted at ratios ranging from 1:1 to 2:1 [native tree/plant species to each elderberry seedling or cutting (see Table 1)]. These native plantings must be monitored with the same survival criteria used for the elderberry seedlings. Stock of saplings, cuttings, and seedlings should be obtained from local sources. If the parent stock is obtained from a distance greater than one mile from the conservation area, approval by the Service of the native plant donor sites must be obtained prior to initiation of the revegetation work. Planting or seeding the conservation area with native herbaceous species is encouraged. Establishing native grasses and forbs may discourage unwanted non-native species from becoming established or persisting at the conservation area. Only stock from local sources should be used.

s. The conservation area is distinct from the avoidance area (though the two may adjoin), and serves to receive and protect the transplanted elderberry shrubs and the elderberry and other native plantings. The Service may accept proposals for off-site conservation areas where appropriate.

t. The conservation area must provide at least 1,800 square feet for each transplanted elderberry shrub. As many as 10 conservation plantings (i.e., elderberry cuttings or seedlings and/or associated native plants) may be planted within the 1800 square foot area with each transplanted elderberry. An additional 1,800 square feet shall be provided for every additional 10 conservation plants.

Each planting should have its own watering basin measuring approximately three feet in diameter. Watering basins should be constructed with a continuous berm measuring approximately 8 inches wide at the base and 6 inches high.

u. The planting density specified above is primarily for riparian forest habitats or other habitats with naturally dense cover. If the conservation area is an open habitat (i.e., elderberry savanna, oak woodland) more area may be needed for the required plantings. Contact the Service for assistance if the above planting recommendations are not appropriate for the proposed conservation area.

v. No area to be maintained as a firebreak may be counted as conservation area. Like the avoidance area, the conservation area should connect with adjacent habitat wherever possible, to prevent isolation of VELB populations.

w. Depending on adjacent land use, a buffer area may also be needed between the conservation area and the adjacent lands. For example, herbicides and pesticides are often used on orchards or vineyards. These chemicals may drift or runoff onto the conservation area if an adequate buffer area is not provided.

x. The conservation area must be protected in perpetuity as habitat for the VELB. A conservation easement or deed restrictions to protect the conservation area must be arranged. Conservation areas may be transferred to a resource agency or appropriate private organization for long-term management. The Service must be provided with a map and written details identifying the conservation area; and the project proponent must receive approval from the Service that the conservation area is acceptable prior to initiating the conservation program. A true, recorded copy of the deed transfer, conservation easement, or deed restrictions protecting the conservation area in perpetuity must be provided to the Service before project implementation.

y. Adequate funds must be provided to ensure that the conservation area is managed in perpetuity. The applicant must dedicate an endowment fund for this purpose, and designate the party or entity that will be responsible for long-term management of the conservation area. The Service must be provided with written documentation that funding and management of the conservation area will be provided in perpetuity.

z. Weeds and other plants that are not native to the conservation area must be removed at least once a year, or at the discretion of the Service and the California Department of Fish and Game. Mechanical means should be used. Herbicides are prohibited unless approved by the Service.

aa. Measures must be taken to insure that no pesticides, herbicides, fertilizers, or other chemical agents enter the conservation area. No spraying of these agents must be done within one 100 feet of the area, or if they have the potential to drift,

flow, or be washed into the area in the opinion of biologists or law enforcement personnel from the Service or the California Department of Fish and Game.

bb. No dumping of trash or other material may occur within the conservation area. Any trash or other foreign material found deposited within the conservation area must be removed within 10 working days of discovery.

cc. Permanent fencing must be placed completely around the conservation area to prevent unauthorized entry by off-road vehicles, equestrians, and other parties that might damage or destroy the habitat of the VELB, unless approved by the Service. The applicant must receive written approval from the Service that the fencing is acceptable prior to initiation of the conservation program. The fence must be maintained in perpetuity, and must be repaired/replaced within 10 working days if it is found to be damaged. Some conservation areas may be made available to the public for appropriate recreational and educational opportunities with written approval from the Service. In these cases appropriate fencing and signs informing the public of the VELB's threatened status and its natural history and ecology should be used and maintained in perpetuity.

dd. A minimum of two prominent signs must be placed and maintained in perpetuity at the conservation area, unless otherwise approved by the Service. The signs should note that the site is habitat of the federally threatened VELB and, if appropriate, include information on the VELB's natural history and ecology. The signs must be approved by the Service. The signs must be repaired or replaced within 10 working days if they are found to be damaged or destroyed.

ee. The population of VELB, the general condition of the conservation area, and the condition of the elderberry and associated native plantings in the conservation area must be monitored over a period of either 10 consecutive years or for 7 years over a 15-year period. The applicant may elect either 10 years of monitoring, with surveys and reports every year; or 15 years of monitoring, with surveys and reports on years 1, 2, 3, 5, 7, 10, and 15. The conservation plan provided by the applicant must state which monitoring schedule will be followed. No change in monitoring schedule will be accepted after the project is initiated. If conservation planting is done in stages (i.e., not all planting is implemented in the same time period), each stage of conservation planting will have a different start date for the required monitoring time.

ff. In any survey year, a minimum of two site visits between February 14 and June 30 of each year must be made by a qualified biologist. Surveys must include: (i.) A population census of the adult VELB, including the number of VELB observed, their condition, behavior, and their precise locations. Visual counts must be used. Mark-recapture or other methods involving handling or harassment must not be used. (ii.) A census of VELB exit holes in elderberry stems, noting their precise locations and estimated ages. (iii.) An evaluation of the elderberry shrubs and

associated native plants on the site, and on the conservation area, if disjunct, including the number of plants, their size and condition. (iv.) An evaluation of the adequacy of the fencing, signs, and weed control efforts in the avoidance and conservation areas. (v.) A general assessment of the habitat, including any real or potential threats to the VELB and its host plants, such as erosion, fire, excessive grazing, off-road vehicle use, vandalism, excessive weed growth, etc.

gg. The materials and methods to be used in the monitoring studies must be reviewed and approved by the Service. All appropriate Federal permits must be obtained prior to initiating the field studies.

hh. A written report, presenting and analyzing the data from the project monitoring, must be prepared by a qualified biologist in each of the years in which a monitoring survey is required. Copies of the report must be submitted by December 31 of the same year to the Service (Deputy Assistant Field Supervisor, Valley Branches, Endangered Species Program, Sacramento Fish and Wildlife Office, 2800 Cottage Way, Room W-2605, Sacramento, California 95825-1846), and the Department of Fish and Game (Supervisor, Environmental Services, Department of Fish and Game, 1416 Ninth Street, Sacramento, California 95814; and Staff Zoologist, California Natural Diversity Data Base, Department of Fish and Game, 1220 S Street, Sacramento, California 95814). The report must explicitly address the status and progress of the transplanted and planted elderberry and associated native plants and trees, as well as any failings of the conservation plan and the steps taken to correct them. Any observations of VELB or fresh exit holes must be noted. Copies of original field notes, raw data, and photographs of the conservation area must be included with the report. A vicinity map of the site and maps showing where the individual adult VELB and exit holes were observed must be included. For the elderberry and associated native plants, the survival rate, condition, and size of the plants must be analyzed. Real and likely future threats must be addressed along with suggested remedies and preventative measures (e.g., limiting public access, more frequent removal of invasive non-native vegetation, etc.).

ii. A copy of each monitoring report, along with the original field notes, photographs, correspondence, and all other pertinent material, should be deposited at the California Academy of Sciences (Librarian, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118) by December 31 of the year that monitoring is done and the report is prepared. The Service's Sacramento Fish and Wildlife Office should be provided with a copy of the receipt from the Academy library acknowledging receipt of the material, or the library catalog number assigned to it.

jj. Biologists and law enforcement personnel from the California Department of Fish and Game and the Service must be given complete access to the project site to monitor transplanting activities. Personnel from both these agencies must be

given complete access to the project and the conservation area to monitor the VELB and its habitat in perpetuity.

kk. A minimum survival rate of at least 60 percent of the elderberry plants and 60 percent of the associated native plants must be maintained throughout the monitoring period. Within 1 year of discovery that survival has dropped below 60 percent, the project proponent must replace failed plantings to bring survival above this level. The Service will make any determination as to the project proponent 's replacement responsibilities arising from circumstances beyond its control, such as plants damaged or killed as a result of severe flooding or vandalism.

2. The following terms and conditions implement reasonable and prudent measures number three (3), four (4), five (5), and six (6):

a. MQI and its' contractors shall minimize the potential for harm and harassment of the CTS and SJKF resulting from project-related activities by implementation of the project description (including the conservation measures) described in the initiation letter (and associated biological assessment) from the Corps to the Service dated April 7, 2006, and Description of the Proposed Action section of this biological opinion.

b. Before ground-disturbing activities commence, MQI shall dedicate the temporary conservation easement (TCE) to a monitoring and management entity that is acceptable to the Service. Furthermore, the Service shall be a signatory party to the easement such that the easement cannot be extinguished without the signature of the Service.

c. MQI shall include a copy of this biological opinion within any solicitations for the proposed project, such as solicitations for design and construction of the proposed project making the prime contractor responsible for implementing all requirements and obligations included within the biological opinion, and to educate and inform all other contractors involved in the project as to the requirements of the biological opinion. A copy of the solicitations containing the biological opinion also will be provided to the Deputy Assistant Field Supervisor (same address as above).

d. All workers at the site shall be required to take endangered species training, and made aware of the requirements in this biological opinion on their first day at the project site by the Service-approved biologist. Sign-up sheets for this training will be provided to the Service in the post-construction compliance report.

e. If requested during or upon completion of construction activities, the Service-approved biologist will accompany Service or CDFG personnel on an on-site

inspection of the site to review proposed project effects to the CTS and SJKF and their habitats.

f. MQI shall adhere to the provisions of the Reporting Requirements as described below in this biological opinion.

Reporting Requirements

1. A post-construction compliance report prepared by the monitoring biologist for MQI must be submitted to the Deputy Assistant Field Supervisor (same address as above) at the Sacramento Fish and Wildlife Office within 30 calendar days of the completion of construction activity or within 30 calendar days of any break in construction activity lasting more than 30 calendar days. This report shall detail the following: (i) dates that groundbreaking at the proposed project started and the project was completed; (ii) pertinent information concerning the success of the proposed project in meeting compensation and other conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the VELB, CTS, or SJKF, if any; (v) occurrences of incidental take of VELB, CTS, or SJKF; and (vi) other pertinent information.

2. MQI must report to the Service immediately any information about take or suspected take of federally-listed species not authorized in this biological opinion. MQI must notify the Service within 24 hours of receiving such information. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal. In the case of a dead animal, the individual animal should be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen or the Service takes custody of the specimen. The Service contact persons are Deputy Assistant Field Supervisor at (916) 414-6600 and Scott Heard, Resident Agent-in-charge of the Service's Office of Law Enforcement at (916) 414-6660.

3. Any contractor or employee who during routine operations and maintenance activities inadvertently kills or injures a State-listed wildlife species must immediately report the incident to their representative and MQI. This representative and MQI must contact the CDFG immediately in the case of a dead or injured listed species. The CDFG contact for immediate assistance is State Dispatch at (916) 445-0045.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and data bases.

1. MQI should continue to assist the Service in the implementation of recovery efforts for the VELB, CTS, and SJKF.

2. The project proponent should fund 2 years of CTS monitoring on Road 209 to determine relative rates and locations of CTS roadway mortality (if any). The monitoring would consist of 3 hours of road survey conducted three times each month during December 1 to February 28 (with a minimum of 4 days between subsequent surveys). The surveys would be initiated 1 hour after sunset. The surveys would be conducted by a biologist approved by the Service. In addition, surveys would be conducted by trained MQI personnel each morning after night-time hauling operations to identify any roadkilled CTS from the evening before. The training of MQI personnel would be performed by a biologist approved by the Service. Individual salamanders that cannot be definitively identified by MQI personnel would be photographed such that the individual(s) can be positively identified by a biologist experienced with CTS. The results of the surveys would be presented to the Service annually in a letter report that is to be submitted by August 15th.

3. The project proponent should conduct 4 years of routine monitoring on Road 209 to determine relative rates and locations of SJKF roadway mortality (if any). The monitoring would be conducted once per week by trained MQI personnel to identify all non-rodent roadkilled mammals (e.g., SJKF, gray fox, coyote, opossum, raccoon, etc.). The training of MQI personnel would be performed by a biologist approved by the Service. Each roadkilled mammal should be photographed such that the individual(s) can be positively identified by a biologist experienced with such identifications. If the species cannot be definitively identified by MQI personnel, the photographs will be transmitted to a biologist approved by the Service who has experience with such identifications. The results of the surveys would be presented to the Service annually in a letter report that is submitted by December 31 of the same year. At a minimum, the report should identify the total number of roadkilled individuals by species for each month.

REINITIATION—CLOSING STATEMENT

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

If you have questions regarding the proposed Madera Quarry mining operations, please contact Dr. Jeffrey P. Jorgenson (Senior Biologist) or Ms. Susan P. Jones (Chief, San Joaquin Valley Branch) of my staff at (916) 414-6600.

Sincerely,

Peter A. Cross

Peter A. Cross
Deputy Assistant Field Supervisor

Enclosures (4):

- Exhibit A: Map with quarry (77.8 acres), processing plant site (28.0 acres), haul road (1.7 acres), and buffer area (12.9 acres; total = 120.9 acres).
- Exhibit B: Map with temporary conservation easement (405 ± acres), quarry, and processing area.
- Exhibit C: Map with permanent conservation easement (270 ± acres), quarry, and processing area.
- Exhibit D: Map with permanent conservation easement and ponds #2, #4C, and #4D.

cc:
U.S. Fish and Wildlife Service, Office of Law Enforcement, Clovis, California (Attn. Bo Stone)
California Department of Fish and Game, Fresno, California (Attn. Ms. Julie Vance)
County of Madera, Planning Department, Madera, California (Attn. Rayburn Beach)
Madera Quarry, Inc., Redding, California (Attn. Jack Baker)
Pacific Municipal Consultants, Sacramento, California (Attn. Joyce Hunting)
Bumgardner Biological Consulting, Gold River, California (Attn. Michael Bumgardner)
Walter Yep, Inc., Sacramento, California (Attn. Teresa Pacheco)

Literature Cited

Anderson, J. D. 1968. Comparison of the food habits of *Ambystoma macrodactylum sigillatum*, *Ambystoma macrodactylum croceum*, and *Ambystoma tigrinum californiense*. Herpetologica 24(4): 273-284.

Anderson, P. R. 1968. The reproductive and developmental history of the California tiger salamander. Masters thesis, Department of Biology, Fresno State College, Fresno, California. 82pp.

Barry, S. J. and H. B. Shaffer. 1994. The status of the California tiger salamander (*Ambystoma californiense*) at Lagunita: A 50-year update. Journal of Herpetology 28(2): 159-164.

Berrill, M., D. Coulson, L. McGillivray, and B. Paul. 1998. Toxicity of endosulfan to aquatic stages of anuran amphibians. Environmental Toxicology and Chemistry 17:1738-1744.

Blaustein, A. R. and D. B. Wake. 1990. Declining amphibian populations: a global phenomenon? Trends in Ecology and Evolution 5(7): 203-204.

Bridges, C. M. 1997. Tadpole swimming performance and activity affected by acute exposure to sublethal levels of carbaryl. Environmental Toxicology and Chemistry 16: 1935-1939.

California Department of Fish and Game (CDFG). 2005. Letter providing comments on the Madera Ranch Quarry and Reclamation Plan Project (CUP #2002-20) Draft Environmental Impact Report (SCH# 2003102128). California Department of Fish and Game, Fresno, California.

California Department of Pesticide Regulation Internet website, 2002. 2000 Annual pesticide use report preliminary data: Sonoma County Indexed by Commodity.

California Natural Diversity Database (CNDDB). 2005. California Department of Fish and Game, Sacramento.

California Natural Diversity Database (CNDDB). 2008. California Department of Fish and Game, Sacramento.

de Llamas, M. C., A. C. de Castro, and A. M. P. de D'Angelo. 1985. Cholinesterase activities in developing amphibian embryos following exposure to the insecticides dieldrin and malathion. Archives of Environmental Contamination and Toxicology 14:161-166.

Feaver, P. E. 1971. Breeding pool selection and larval mortality of three California amphibians: *Ambystoma tigrinum californiense* Gray, *Hyla regilla* Baird and Girard and *Scaphiopus hammondi hammondi* Girard. Master's thesis, Department of Biology, Fresno State College, Fresno, California. 58pp.

Fitzpatrick, B. M. and H. B. Shaffer. 1996. Environmental-dependent admixture dynamics in a tiger salamander hybrid zone. Evolution 58(6): 1282-1293.

Gamradt, S. C. and L. B. Kats. 1996. Effect of introduced crayfish and mosquito fish on California newts. Conservation Biology 10(4): 1155-1162.

Holland, R. F. 1998. No Net Loss? Changes in Great Valley Vernal Pool Distribution from 1989 to 1997. Natural Heritage Division. California Department of Fish and Game, Sacramento, California. 16pp.

Jennings, M.R. and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. Report prepared for the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California. 255 pp.

Jones and Stokes and Associates. 1987. Sliding toward extinction: California's natural heritage.

Keeler-Wolf, T., D. R. Elam, K. Lewis, and S. A. Flint. 1998. California vernal pool assessment preliminary report. California Department of Fish and Game, Sacramento.

Kuchler, A.W. 1988. The Map of the Natural Vegetation of California. Pp 909-938 and map *in* M. G. Barbour and J. Major (Editors). Terrestrial Vegetation of California. California Native Plant Society, Special Publication No. 9.

Lawler, S. P., D. Dritz, T. Strange, and M. Holyoak. 1999. Effects of introduced mosquitofish and bullfrogs on the threatened California red-legged frog. Conservation Biology 13(3):613-622.

Leyse, K. and S. P. Lawler. 2000. Effects of Mosquitofish (*Gambusia affinis*) on California Tiger Salamander (*Ambystoma californiense*) Larvae in Permanent Ponds. Mosquito Control Research, Annual Report 2000. University of California, Davis, California.

Loredo, I., and D. Van Vuren. 1996. Reproductive ecology of a population of the California tiger salamander. Copeia 1996(4):895-901.

Loredo, I., D. Van Vuren and M. L. Morrison. 1996. Habitat use and migration behavior of the California tiger salamander. Journal of Herpetology 30(2): 282-285.

Loredo-Prendeville, I., D. Van Vuren, A. J. Kuenzi, and M. L. Morrison. 1994. California ground squirrels at Concord Naval Weapons Station: alternatives for control and the ecological consequences. Pp. 72-77 *in* W. S. Halverson and A. C. Crabb (editors). Proceedings of the 16th Vertebrate Pest Conference. University of California Publications.

Morey, S. R. 1998. Pool duration influences age and body mass at metamorphosis in the western spadefoot toad: implications for vernal pool conservation. Pages 86-91 *in* C.W. Witham, E.T. Bauder, D. Belk, W.R. Ferren Jr., and R. Ornduff (eds). Ecology, Conservation, and Management of Vernal Pool Ecosystems - Proceedings from a 1996 Conference. California Native Plant Society. Sacramento, California. 1998.

Morey, S. R. and D. A. Guinn. 1992. Activity patterns, food habits, and changing abundance in a community of vernal pool amphibians. Pp. 149-157 *in* Williams, D. F., S. Byrne, T.A. Rado (editors). Endangered and Sensitive Species of the San Joaquin Valley, California. California Energy Commission, Sacramento, California . 1992.

Orloff, S.G. 2003. Comments on the Central California DPS of the California tiger salamander (CTS) Proposed Rule. Ibis Environmental Services, San Rafael, California.

Pechmann, J. H. K., D. E. Scott, J. W. Gibbons, and R. D. Semlitsch. 1989. Influence of wetland hydroperiod on diversity and abundance of metamorphosing juvenile amphibians. Wetlands Ecology and Management 1(1):3-11.

Petranka, J. W. 1998. Salamanders of the United States and Canada. Smithsonian Institution Press, Washington, D.C.

Riley, S. P. D., H. B. Shaffer, S. R. Voss, and B. M. Fitzpatrick. 2003. Hybridization between a rare, native tiger salamander (*Ambystoma californiense*) and its introduced congener. Biological Applications 13(5): 1263-1275.

Rosenbaum, E. A., de Castro, C. Gauna, L., and D'Angelo, de. P. 1988. Early biochemical changes produced by Malathion on toad embryos.

Science Applications International Corporation. Discussion regarding movements of California tiger salamanders and western spadefoot toads on State Water Project. Unpublished data.

Scott, D. E. 1994. The effect of larval density on adult demographic traits in *Ambystoma opacum*. Ecology 75:1383-1396.

Semlitsch, R. D., D. E. Scott, and J. H. K. Pechmann. 1988. Time and size at metamorphosis related to adult fitness in *Ambystoma talpoideum*. Ecology 69: 184-192.

Seymour, R. and M. Westphal. 1994. Final Report - Status and habitat correlates of California tiger salamanders in the eastern San Joaquin Valley: results of the 1994 survey. Report prepared by the Coyote Creek Riparian Station for the U.S. Fish and Wildlife Service, Sacramento Office. 33 pp.

Shaffer, H.B., G. B. Pauly, J.C. Oliver, and P.C. Trenham. 2004. The molecular phylogenetics of endangerment: cryptic variation and historic phylogeography of the California tiger salamander, *Ambystoma californiense*. Molecular Ecology 13: 3033-3049.

Shaffer, H. B. and P. C. Trenham. 2002. Distinct Population Segments of the California Tiger Salamander. Section of Evolution and Ecology, and Center for Population Biology, University of California.

Shaffer, H. B., R. N. Fisher, and S. E. Stanley. 1993. Status report: the California tiger salamander (*Ambystoma californiense*). Final report for the California Department of Fish and Game. 36 pp. plus figures and tables.

Sparling, D. W., G. M. Fellers, and L. L. McConnell. 2001. Pesticides and amphibian population declines in California, USA. Environmental Toxicology and Chemistry 20(7):1591-1595.

Stebbins, R.C. 1985. A field guide to western reptiles and amphibians. Houghton Mifflin Co. Boston, Massachusetts. Pp. 33-37.

_____. 1989. Declaration of R. C. Stebbins in support of petition of writ of mandate. Sierra Club and Richard Pontuis v. Gilroy City Council, Shappell Industries *et al.* Santa Clara County Superior Court. March 16, 1989. 11 pp. plus exhibits.

_____. 2003. A field guide to western reptiles and amphibians. Houghton Mifflin Company, Boston, Massachusetts.

Storer, T. I. 1925. A synopsis of the amphibia of California. University of California Publications in Zoology 27: 60-71.

Sweet, S. 1998. Letter to Dwight Harvey, U.S. Fish and Wildlife Service with an unpublished report titled Vineyard development posing an imminent threat to *Ambystoma californiense* in Santa Barbara County, California. University of California, Santa Barbara, California.

Talley, T.S., D. Wright, and M. Holyoak. 2006. Assistance with the 5-Year Review of the Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Sacramento, California. 89 pp.

Trenham, P. C. 1998a. Radiotracking information. University of California, Davis, California. Unpublished manuscript. 6 pages.

_____. 1998b. Demography, migration, and metapopulation structure of pond breeding salamanders. Ph.D. dissertation. University of California, Davis, California.

Trenham, P. C. 2001. Terrestrial habitat use by adult California tiger salamanders. Journal of Herpetology 35:343–346.

Trenham, P. C., W. D. Koenig, and H. B. Shaffer. 2001. Spatially autocorrelated demography and interpond dispersal in the salamander *Ambystoma californiense*. Ecology 82: 3519-3530.

Trenham, P.C., and H.B. Shaffer. 2005. Amphibian upland habitat use and its consequences for population viability. Ecological Applications 15(4):1158-1168.

Trenham, P. C., H. B. Shaffer, W. D. Koening and M. R. Stromberg. 2000. Life History and Demographic variation in the California Tiger Salamander (*Ambystoma californiense*). Copeia 2000(2): 365-377.

Twitty, V. C. 1941. Data on the life history of *Ambystoma tigrinum californiense* Gray. Copeia 1941(1):1-4.

U.C. Berkeley, Essig Museum of Entomology. 2004. *California's Endangered Insects – Valley Elderberry Longhorn Borer.* (http://essig.berkeley.edu/endins/desmocer.htm).

University of California Integrated Pest Management (UCIPM). 2003. Internet website. January 2003.

U.S. Fish and Wildlife Service (Service). 1980. Listing the Valley Elderberry Longhorn Beetle as a Threatened Species with Critical Habitat. Federal Register 45:52803-52807.

_____. 1984. Valley Elderberry Longhorn Beetle Recovery Plan. Portland, Oregon.

_____. 1996. Formal Programmatic Consultation Permitting Projects with Relatively Small Effects on the Valley Elderberry Longhorn Beetle within the Jurisdiction of the Sacramento Field Office, California. September 19, 1996.

_____. 1998. Recovery Plan for Upland Species of the San Joaquin Valley, California. Region 1, Portland, Oregon. 319 pp.

_____. 1999. Conservation Guidelines for the Valley Elderberry Longhorn Beetle. U.S. Department of the Interior, Fish and Wildlife Service. Sacramento. July 9, 1999. 13 pp.

_____. 2003. Endangered and threatened wildlife and plants. Listing of the Central California Distinct Population Segment of the California tiger salamander. Proposed Rule. 68 Federal Register. 28648-28670. May 23, 2003.

_____. 2004a. Endangered and threatened wildlife and plants. Determination of threatened status for the Central California Distinct Population Segment of the California tiger salamander and special rule exemption for existing routing ranching activities. Final Rule. 69 Federal Register. 47212-47248. August 4, 2004.

_____. 2004b. Endangered and threatened wildlife and plants. Designation of critical habitat for the central population of the California tiger salamander. Proposed Rule. 69 Federal Register 48570-48649. August 10, 2004.

_____. 2005. Endangered and threatened wildlife and plants. Designation of critical habitat for the central population of the California tiger salamander. Final Rule. 70 Federal Register 49380-49458. August 23, 2005.

_____. 2006. Valley Elderberry Longhorn Beetle (*Desmocereus californicus dimorphus*); 5-Year Review: Summary and Evaluation. Sacramento Fish and Wildlife Office, Sacramento. 30 pp.

Van Hattem, M. G. 2004. Underground ecology and natural history of the California tiger salamander. Master of Science thesis. San Jose State University, San Jose, California.

Vollmar, J. E. (Ed.). 2002. Wildlife and Rare Plant Ecology of Eastern Merced County's Vernal Pool Grasslands. Vollmar Consulting, Berkeley, California. 446pp.

Wilbur, H. M. and J. P. Collins. 1973. Ecological aspects of amphibian metamorphosis. Science 18(4119): 1301-1314.

Wise, S. and B. W. Buchanan. 2002. The influence of artificial illumination on the nocturnal behavior and ecology of salamanders. Paper presented at the Urban Wildlands Group's Ecological Consequences of Artifieial Night Lighting. February 23-24- 2002. University of California, Los Angeles, California.

In Litt.

Boyce, K. 1994. Beneficials: mosquitofish. Sacramento County/Yolo County Mosquito and Vector Control District.

Jones, T.R., Ph.D., School of Natural Resources and Environment, University of Michigan. 27 January 1993 letter to Mike Long, U.S. Fish and Wildlife Service, with attached draft manuscript.

Personal Communications

Steve Sykes, University of California at Santa Barbara, unpublished data, October 22, 2005.

Exhibit A

Map with quarry (77.8 acres), processing plant site (28.0 acres), haul road (1.7 acres), and buffer area (12.9 acres; total = 120.9 acres).

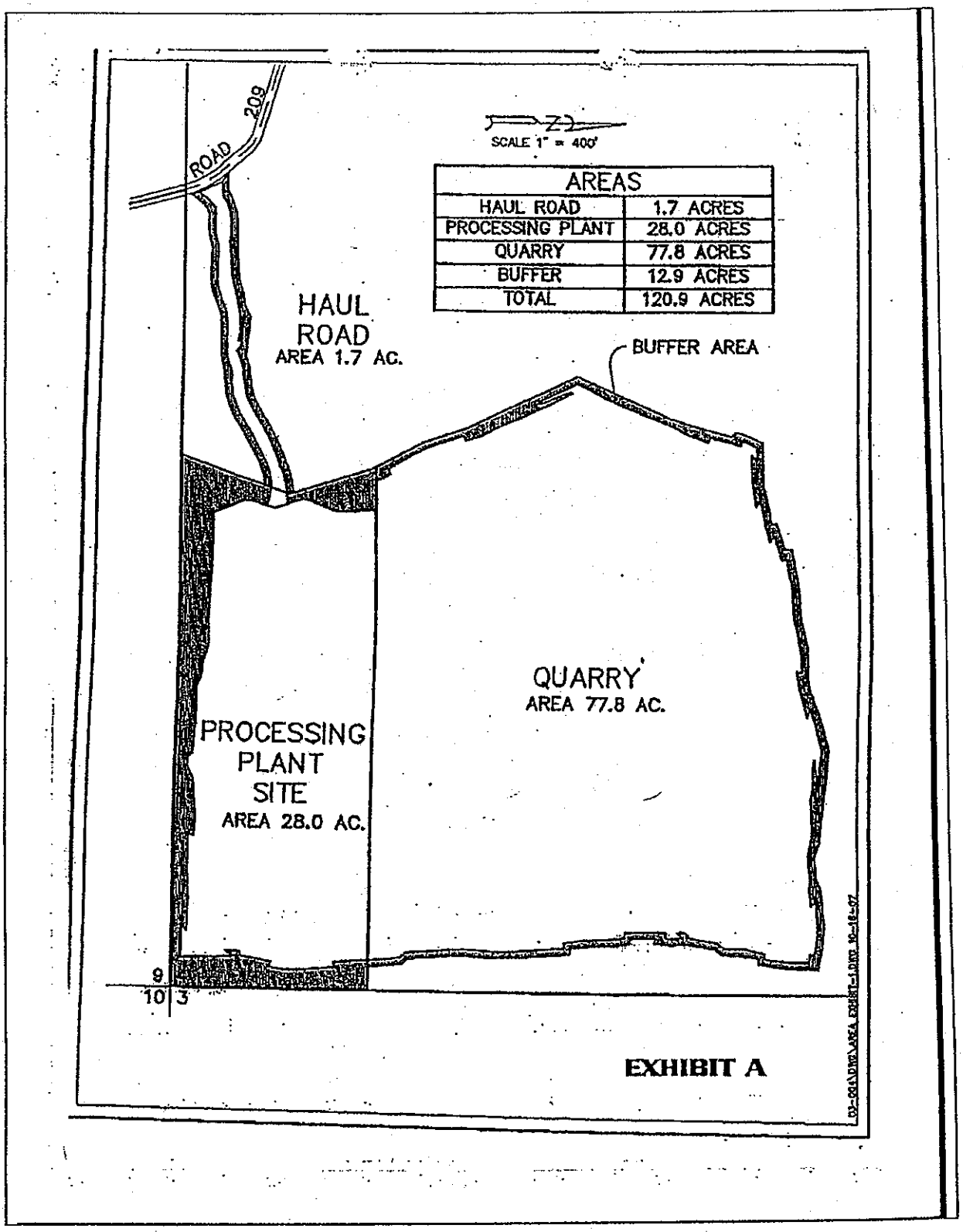

209
ROAD
SCALE 1" = 400'
AREAS
HAUL ROAD 1.7 ACRES
PROCESSING PLANT 28.0 ACRES
QUARRY 77.8 ACRES
BUFFER 12.9 ACRES
TOTAL 120.9 ACRES
HAUL ROAD AREA 1.7 AC.
BUFFER AREA
QUARRY AREA 77.8 AC.
PROCESSING PLANT SITE AREA 28.0 AC.
9
10 3
EXHIBIT A

Exhibit B

Map with temporary conservation easement (405 ± acres), quarry, and processing area.

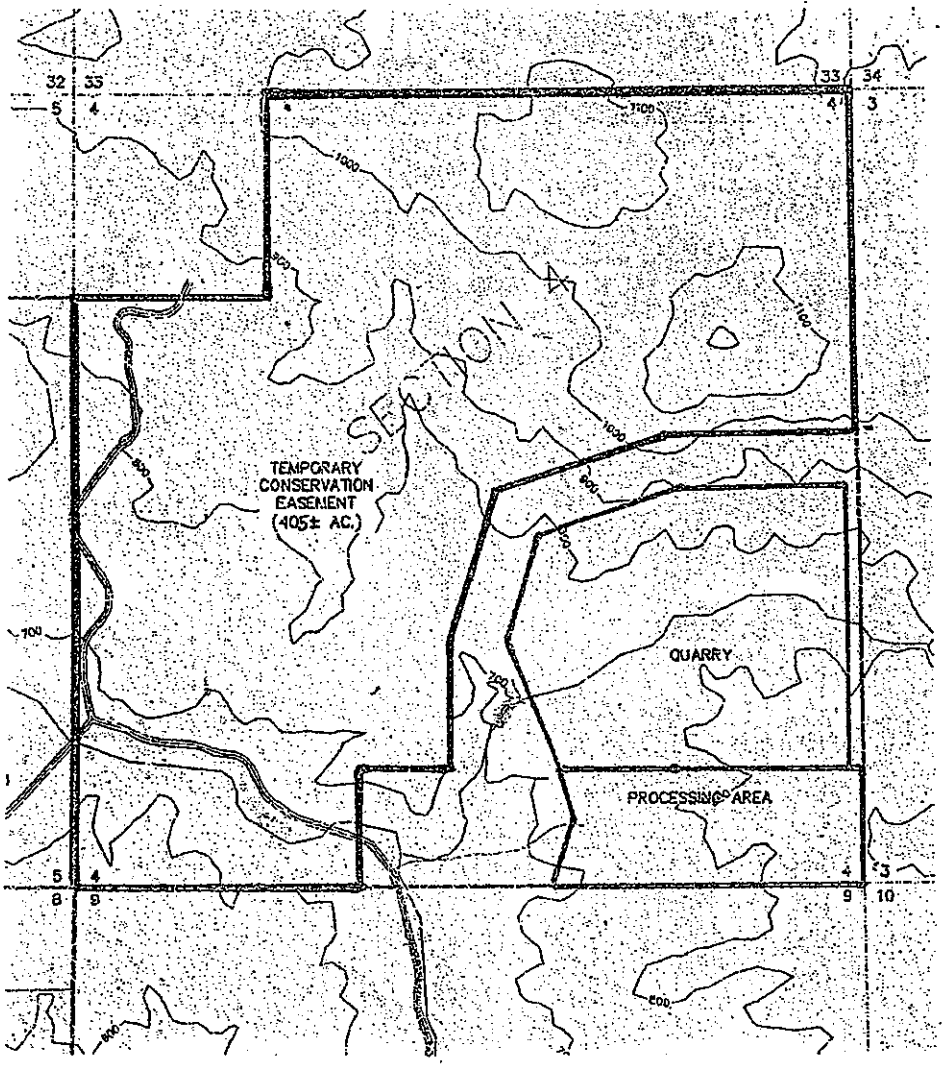

32
33
5
4
33
34
4
3
1100
1000
900
SECTION 4
TEMPORARY
CONSERVATION
EASEMENT
(405± AC.)
1000
900
800
700
QUARRY
PROCESSING AREA
5
4
4
3
8
9
9
10
600

EXHIBIT B

Exhibit C

Map with permanent conservation easement (270 ± acres), quarry, and processing area.

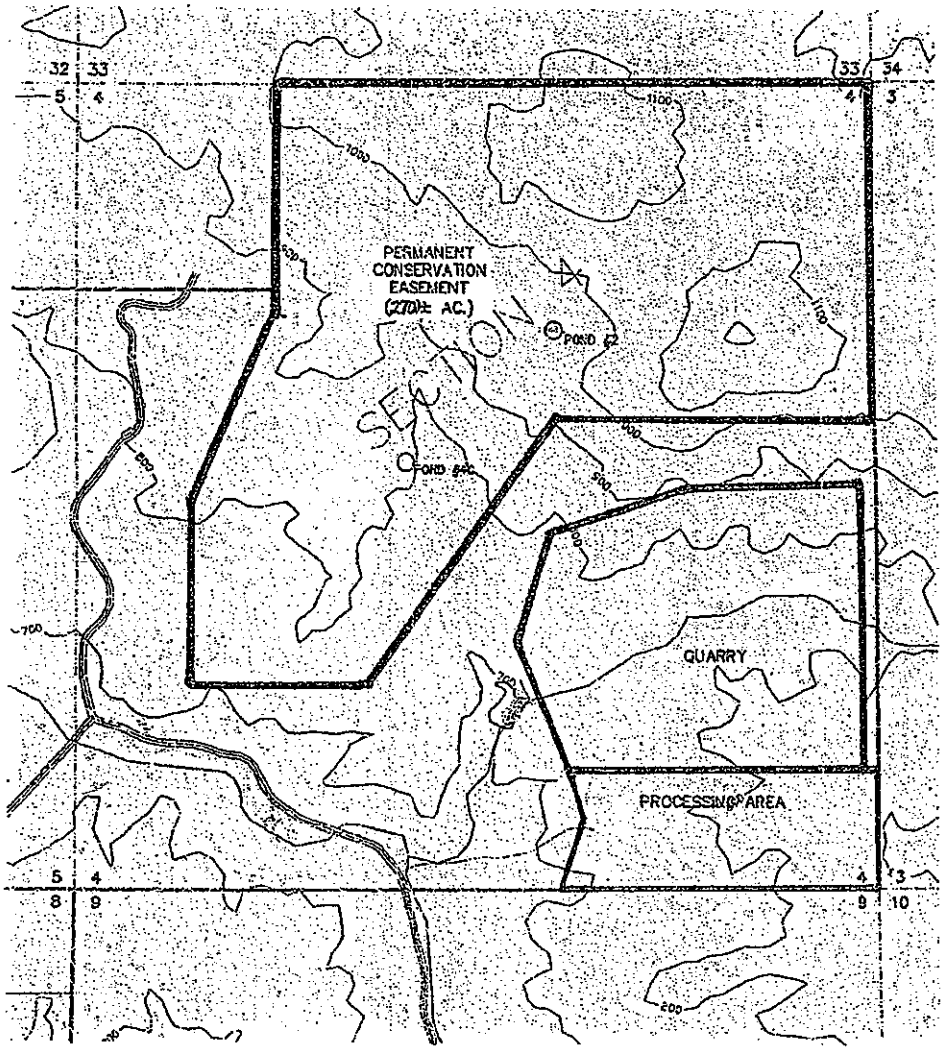
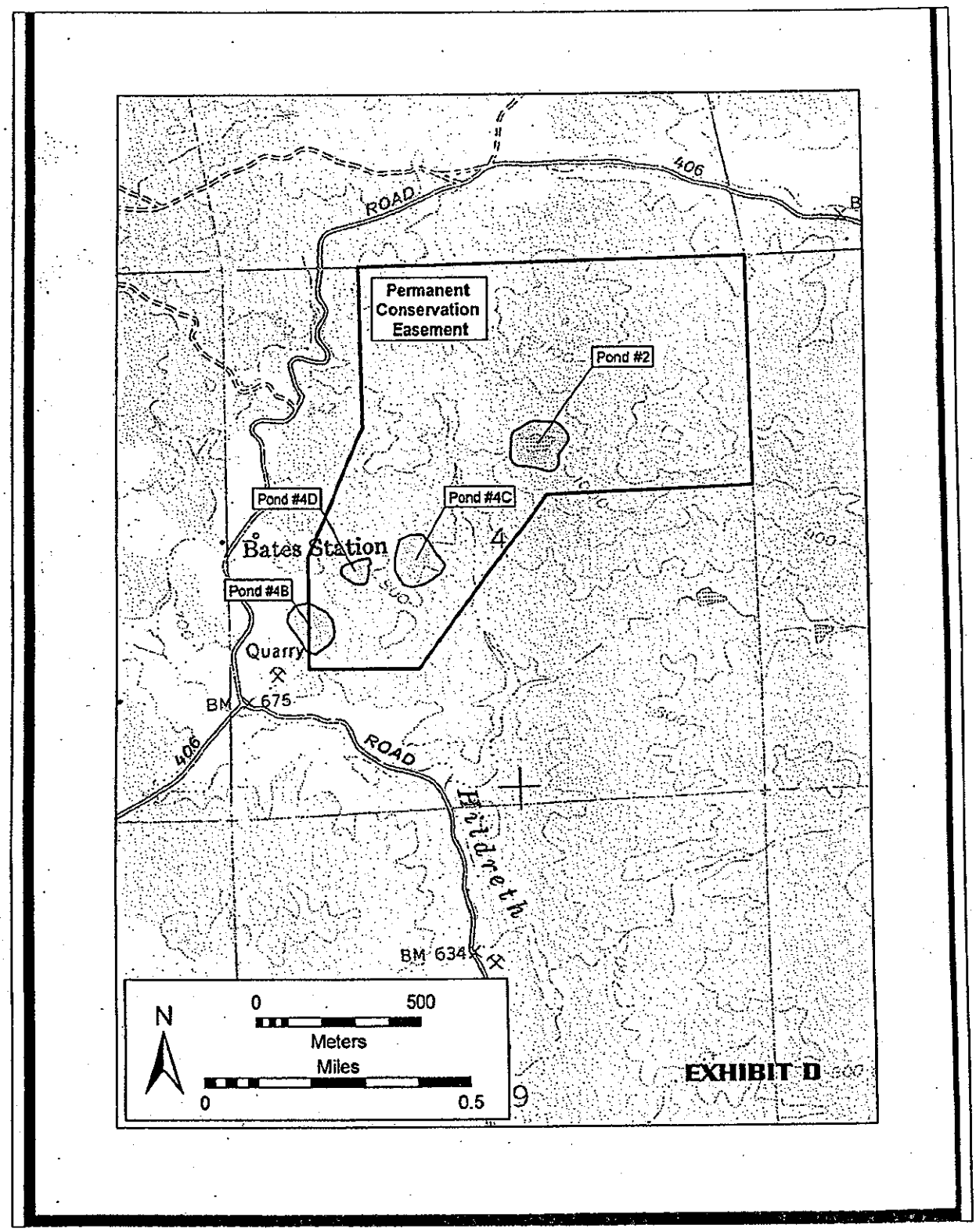

PERMANENT
CONSERVATION
EASEMENT
(270± AC.)
POND #2
POND #1
QUARRY
PROCESSING AREA
SECTION
32
33
34
5
4
3
8
9
10

EXHIBIT C

Exhibit D

Map with permanent conservation easement and ponds #2, #4C, and #4D.


406
ROAD
Permanent
Conservation
Easement
Pond #2
Pond #4D
Pond #4C
Bates Station
Pond #4B
Quarry
BM 675
406
ROAD
Hildreth
BM 634
N
0
500
Meters
Miles
0
0.5
EXHIBIT D

Blank page

Addresses for cc:

Mr. Ramon Aberasturi, U.S. Army Corps of Engineers, 1325 J Street, Room 1480, Sacramento, California 95814-2922

Ms. Julie Vance, California Department of Fish and Game, 1234 E. Shaw, Fresno, CA 93710 (Tel. 559-243-4014 ext. 222; Fax 559-243-4020)

Mr. Bo Stone, U.S. Fish and Wildlife Service, Office of Law Enforcement, 197 N. Sunnyside Ave., Clovis, California 93611 (Tel 559-487-5773; Fax 559-487-5107)

Mr. Jack Baker, Madera Quarry, Inc., P.O. Box 994248, Redding, California 96099

Mr. Rayburn Beach, Planning Department, County of Madera, 2037 West Cleveland Avenue M.S. G, Madera, California 93637

Ms. Joyce Hunting, Pacific Municipal Consultants, 10461 Old Placerville Road, Sacramento, California 95827

Mr. Michael Bumgardner, Bumgardner Biological Consulting, 11571 Prospect Hill Drive, Gold River, California 95670

Ms. Teresa Pacheco, Walter Yep, Inc., P. O. Box 19440, Sacramento, CA 95819

California Regional Water Quality Control Board
Central Valley Region
Karl Longley, ScD, PE, Chair

Linda S. Adams
Secretary for Environmental Protection

Fresno Branch Office
1685 E Street, Fresno, California 93706
(559) 445-5116 • Fax (559) 445-5910
http://www.waterboards.ca.gov/centralvalley

Arnold Schwarzenegger
Governor

17 July 2008

RECEIVED
JUL 21 2008

Jaxon Baker
Madera Quarry, Inc.
1643 Tahoe Court
Redding, CA 96003

ACTION ON REQUEST FOR CLEAN WATER ACT SECTION 401 WATER QUALITY CERTIFICATION FOR DISCHARGE OF DREDGED AND/OR FILL MATERIALS ASSOCIATED WITH THE MADERA QUARRY PROJECT, MADERA COUNTY

APPLICANT: Madera Quarry, Inc.

PROJECT: Refer to Attachment 1 for Project Information

ACTION:

1. ☐ Order for Standard Certification
2. ■ Order for Technically-conditioned Certification
3. ☐ Order for Denial of Certification

WATER QUALITY CERTIFICATION STANDARD CONDITIONS:

1. This certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Section 13330 of the California Water Code and Section 3867 of Title 23 of the California Code of Regulations (23 CCR).

2. This certification action is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent certification application was filed pursuant to 23 CCR subsection 3855(b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.

3. The validity of any non-denial certification action is conditional upon total payment of the full fee required under 23 CCR Section 3833, unless otherwise stated in writing by the certifying agency.

4. Certification is valid for five years, or until the expiration and/or withdrawal of the U.S. Army Corps Section 404 permit, whichever comes first. This Certification may be extended by the request of the Discharger prior to the expiration date. The Discharger shall notify the Regional Water Board in writing within 7 days of project completion.

ADDITIONAL CONDITIONS (for Certification Action 2):

In addition to the four standard conditions, the Discharger must comply with the following:

1. A finalized Streambed Alteration Agreement must be issued by DFG before this project may proceed. A copy of the finalized Streambed Alteration Agreement shall be submitted to the Regional Water Board.

2. Activities shall not cause oils, greases or other materials to form a visible film or coating on the water surface or on objects in the receiving waters.

3. Activities shall not cause oils, greases, floating material (liquids, solids, foams, and scums) or suspended material to create a nuisance or adversely affect beneficial uses.

4. Activities shall not cause petroleum products or hazardous materials to be placed or stored in any surface waters, or anywhere they may discharge to surface waters.

5. Except for activities permitted by the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act, soil, silt, or other organic or earthen materials shall not be placed where such materials could pass into surface waters or surface water drainage courses, and adversely affect beneficial uses.

6. Activities shall not cause concentrations of dissolved oxygen to fall below 5.0 mg/L.

7. Activities shall not cause changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

    a. Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
    b. Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.
    c. Where natural turbidity is equal to or between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
    d. Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

8. Activities shall not cause the normal ambient pH to fall below 6.5, exceed 8.3, or change by more than 0.3 units.

9. Diverted stream flow energy must be dissipated, to the extent necessary, such that no erosion of the streambed results. Other BMPs must be employed as necessary to prevent downstream sedimentation.

10. All areas disturbed by project activities shall be protected from washout or erosion.

11. The Discharger shall notify the Regional Water Board immediately if any of the above conditions are violated, along with a description of measures it is taking to remedy the violation.

REGIONAL WATER QUALITY CONTROL BOARD CONTACT PERSON:

Bridget Supple, Environmental Scientist
(559) 445-5919
bsupple@waterboards.ca.gov

WATER QUALITY CERTIFICATION:

I hereby issue an order certifying that the proposed discharge of fill at the Madera Quarry project will comply with the applicable provisions of Sections 301 ("Effluent Limitations"), 302 ("Water Quality Related Effluent Limitations"), 303 ("Water Quality Standards and Implementation Plans"), 306 ("National Standards of Performance"), and 307 ("Toxic and Pretreatment Effluent Standards") of the Clean Water Act. This discharge is also regulated under State Water Board Water Quality Order No. 2003-0017-DWQ, "Statewide General Waste Discharge Requirements For Dredged Or Fill Discharges That Have Received State Water Quality Certification (General WDRs)," which can be accessed at:

http://www.waterboards.ca.gov/cwa401/docs/generalorders/go_wdr401regulated_projects.pdf

Except insofar as may be modified by any preceding conditions, all certification actions are contingent on (a) the discharge being limited and all proposed mitigations being completed in strict compliance with the applicant's project description and the attached Project Information Sheet, and (b) compliance with all applicable requirements of the Regional Water Board's *Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin, Fourth Edition, Revised October 2007.*

for Pamela C. Creedon
Executive Officer

Attachment: Project Information

cc: (see next page)

cc: Dave Smith, Chief, Wetlands Regulatory Office, U.S. Environmental Protection Agency, Region 9, San Francisco (email)
Kathleen Dadey, Chief, Sacramento South Branch, Regulatory Unit, Department of the Army, Corps of Engineers, Sacramento
Bill Orme, Water Quality Certification Unit Chief, Division of Water Quality, State Water Resources Control Board, Sacramento (email)
W.E. Loudermilk, Regional Manager, San Joaquin Valley-Southern Sierra Region, California Department of Fish and Game, Fresno
Joyce Hunting, Senior Biologist, PMC, 2729 Prospect Park Drive, Suite 220, Rancho Cordova, CA 95670

R:\Reg\Common\wdh.sec\401 Certification\401 BLS files\PENDING\Madera Quarry\Certification.doc

ATTACHMENT 1
PROJECT INFORMATION

Application Date:	3 June 2008
Applicant:	Madera Quarry Inc.
Applicant Representatives:	Jaxon Baker
Project Name:	Madera Quarry
Applicant Number:	RN #336
Project Location:	37°05'15" North Latitude, 119°47'19" West Longitude; Sections 4, 9, 16, 21, 28, and 33 of Township 10 South, Range 20 East, MDB&M.
Project Duration:	October 2008 through April 2061
County:	Madera
Receiving Water(s) (hydrologic unit):	Hildreth Creek and Cottonwood Creek, tributaries to the San Joaquin River; San Joaquin River Hydrologic Basin; (Quarry portion of site: San Joaquin Valley Floor Hydrologic Unit, Madera Hydrologic Area; # 539.20) (Portion of Road 209: San Joaquin Valley Floor Hydrologic Unit; Berenda Creek Hydrologic Area; #545.30) (Southern portion of Road 209: Awahnee Hydrologic Unit; Daulton Hydrologic Area; #539.20)
Water Body Type:	Creeks, seasonal wetlands, intermittent drainages, and ephemeral drainages.
Designated Beneficial Uses:	The designated beneficial uses of tributaries to the San Joaquin River between Friant Dam and Mendota Pool are: municipal and domestic supply; agricultural supply; industrial process supply; water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; spawning, reproduction, and/or early development; and wildlife habitat.
Project Description:	Madera Quarry Inc. proposes to develop a hard rock quarry on approximately 121 acres of the 540 acre Madera Ranch. The quarry site will be developed to include an aggregate processing facility, a hot mix asphalt plant, an administration complex, multiple parking areas, a paved haul road, and various stockpile and

processing areas. The quarry will generate wash water and storm water discharges that will be regulated under separate Waste Discharge Requirements and National Pollutant Discharge Elimination System (NPDES) permits. Madera Quarry Inc. will complete the following activities that are subject to Water Quality Certification pursuant to Section 401 of the federal Clean Water Act:

Conduct a study to determine baseline vegetation data. This will be done by collecting in the grass/forb and shrub layers of the mine site, focusing on quantifying two parameters within the sample plots: (1) cover and (2) density.

Construct improvements to County Road 209, including the replacement of ten existing culverts and the installation of two new culverts (this work includes the fill of 0.14 acres of intermittent drainage and 0.02 acres of ephemeral drainage).

Construct a new paved haul road from Road 209 to the active mining site (this work includes the fill of 0.01 acres of intermittent drainage).

Extract hard rock aggregates from the designated Quarry Excavation Area, which is designed to eventually be 86 acres in size and 570 feet deep (this work includes the removal of 0.63 acres of seasonal wetland and 0.49 acres of intermittent drainage).

Construct a new channel for the intermittent drainage that currently exists within the planned Quarry Excavation Area to direct water around the northern edge of the area and rejoin the original channel. This drainage is a tributary to Hildreth Creek.

Preliminary Water Quality Concerns: Soil erosion, increased turbidity, deposition of settleable material, and transport of pollutants to Hildreth Creek and Cottonwood Creek.

Proposed Mitigation To Address Concerns: Best Management Practices (BMPs) will be implemented at all times to prevent sedimentation of surface waters.

Work in the drainages will take place during the dry season when the drainages will be dry.

Fill/Excavation Area: The project will result in permanent impacts of 0.63 acres to seasonal wetlands, permanent impacts of 0.64 acres to intermittent

	drainages, and permanent impacts of 0.018 acres to ephemeral drainages.
Dredge Volume (cy):	None
U.S. Army Corps of Engineers Permit:	Madera Quarry Inc. applied for an Individual Permit (No. 200500673), and the U.S. Army Corps of Engineers posted a Public Notice from 3 August 2006 to 2 September 2006.
Department of Fish and Game Streambed Alteration Agreement:	Madera Quarry Inc. applied for two Streambed Alteration Agreements from DFG on 22 February 2008 and 7 May 2008. A Draft Streambed Alteration Agreement (2007-0209-R4) has been prepared for the project activities that include the culvert replacements along County Road 209.
CEQA Compliance:	Madera Quarry Inc. prepared an Environmental Impact Report (SCH No. 2003102128) with Madera County as the lead agency, and submitted it to State Clearinghouse on 24 June 2005; prepared a Final Environmental Impact Report and submitted it to State Clearinghouse on 3 February 2006; and prepared a Notice of Determination and submitted it to the Madera County Clerk on 31 October 2006.
Compensatory Mitigation:	Madera Quarry Inc. proposes to create 0.76 acres of wetlands and 0.79 acres of streambed on a 132 acre portion of the property that is to be set aside as a preserve site.
Application Fee Provided:	A fee of $2,773.50 was submitted on 3 June 2008 and an additional $500.00 was submitted on 12 June 2008 as required by 23 CCR Section 3833(b)(2)(A).